ANTIBODY MOLECULES TO APRIL AND USES THEREOF

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No. 62/259,897, filed November 25, 2015, U.S. Provisional Application No. 62/313,684, filed March 25, 2016, U.S. Provisional Application No. 62/399,087, filed September 23, 2016, U.S. and U.S. Provisional Application No. 62/422,848, filed November 16, 2016. The contents of the aforementioned applications are hereby incorporated by reference in their entirety.

SEQUENCE LISTING

The instant application contains a Sequence Listing which has been submitted electronically in ASCII format and is hereby incorporated by reference in its entirety. Said ASCII copy, created on November 21, 2016, is named P2029-7004WO_SL.txt and is 259,298 bytes in size.

BACKGROUND

IgA nephropathy is one of the most prevalent, chronic glomerular diseases worldwide. Conservative epidemiological estimates cite a global incidence of approximately 5-50 cases/million (children) and 10-40 cases /million (adults). This incidence of disease presents a regional bias with a higher prevalence in Asia and the Americas, with a particularly higher disease burden in Japan and regions of China. Biopsy confirmed cases of IgA nephropathy in Japan are projected at approximately 350,000. In the US, this projection is approximately 100,000—as such, it is the most frequently diagnosed 1° glomerular disease in adults. While a relatively indolent disease, IgA nephropathy leads to end stage renal disease (ESRD), *i.e.,* renal failure in 20-50% of patients within a 20-30 year span. These numbers are likely grossly underreported given the need to confirm the disease by kidney biopsy, a protocol that is variably practiced in various clinical settings. The disease has a complex pathogenesis with genetic, epidemiological, and potentially environmental components to disease etiology, pathology, and progression. It likewise has a variable clinical presentation ranging from asymptomatic to end-stage renal failure (ESRD). IgA nephropathy is caused by the deposition of IgA, typically in the form of immune complexes in the mesangium of the kidney. There are currently no disease-specific treatments to address primary disease or progression.

There is a need for developing new approaches for treating, preventing and diagnosing IgA nephropathy and other disorders that share similar disease mechanisms.

SUMMARY

This disclosure provides, at least in part, antibody molecules that bind to APRIL, *e.g.*, human and/or mouse APRIL, and that comprise one or more functional and structural properties disclosed herein. In an example, the antibody molecule binds to and/or reduces (*e.g.,* inhibits, blocks or

neutralizes) one or more activities of APRIL. In an example, the antibody molecule binds to a region in APRIL that interacts with TACI (*e.g.,* the CRD2 domain of TACI). In an example, the antibody molecule binds to one or more residues within a region of human APRIL as defined in any of **Tables 3-4 or 7-8**. While not wishing to be bound by theory, it is believed that in an example, improved or optimal inhibition of APRIL activities can be achieved, by targeting certain region(s) on APRIL (*e.g.,* the region(s) associated with the interactions between APRIL and the CDR2 domain of TACI). In an example, the antibody molecule is selected from **Table 1 or 5**, or competes for binding to APRIL with an antibody molecule selected from **Table 1 or 5**. In an example, the antibody molecule binds to the same or overlapping epitope as the epitope recognized by an antibody molecule selected from **Table 1 or 5**. In an example, the antibody molecule comprises one or more heavy chain variable regions and/or one or more light chain variable regions described in **Table 1 or 5**. In an example, the antibody molecule comprises one or more heavy chain CDRs and/or one or more light chain CDRs described in **Table 1 or 5**. In an example, nucleic acid molecules encoding the antibody molecules, expression vectors, host cells, compositions (*e.g.*, pharmaceutical compositions), kits, containers, and methods for making the antibody molecules, are also provided. The antibody molecules disclosed herein can be used (alone or in combination with other agents or therapeutic modalities) to treat, prevent and/or diagnose disorders associated with APRIL, such as IgA nephropathy.

Accordingly, this disclosure provides an antibody molecule, *e.g.*, an antibody molecule described herein, having one or more (*e.g.,* 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, or 23) of the following properties:

a) Binds to human APRIL with high affinity, *e.g.,* with a dissociation constant (K_D) of less than about 100 nM, typically about 10 nM, and more typically, about 10-0.001 nM, about 10-0.01 nM, about 5-0.01 nM, about 3-0.05 nM, about 1-0.1 nM, or stronger, *e.g.,* less than about 80, 70, 60, 50, 40, 30, 20, 10, 8, 6, 4, 3, 2, 1, 0.5, 0.2, 0.1, 0.05, 0.01, 0.005, or 0.001 nM,

b) Binds to mouse APRIL with high affinity, *e.g.,* with a dissociation constant (K_D) of less than about 100 nM, typically about 10 nM, and more typically, about 10-0.001 nM, about 10-0.01 nM, about 5-0.01 nM, about 3-0.05 nM, about 1-0.1 nM, or stronger, *e.g.,* less than about 80, 70, 60, 50, 40, 30, 20, 10, 8, 6, 4, 3, 2, 1, 0.5, 0.2, 0.1, 0.05, 0.01, 0.005, or 0.001 nM,

c) Does not bind to mouse APRIL, or binds mouse APRIL with low affinity, *e.g.,* with a dissociation constant (K_D) of greater than about 500 nM, *e.g.,* greater than about 1000 nM,

d) Does not bind, or binds with low affinity, *e.g.,* with a dissociation constant (K_D) of greater than about 500 nM, *e.g.,* greater than about 1000 nM, to one or more (*e.g.,* 2, 3, 4, 5, 6, 7,

2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 4035-062, 3934, 3833, 3631, 3732, 4338, 4540, 4540-063, 4540-033, 4439, or 4237,

u) Competes for binding with a second antibody molecule to human APRIL, mouse APRIL, or both, wherein the second antibody molecule is a monoclonal antibody chosen from **Table 1 or 5**, *e.g.,* any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 4035-062, 3934, 3833, 3631, 3732, 4338, 4540, 4540-063, 4540-033, 4439, or 4237,

v) Has one or more biological properties of a monoclonal antibody chosen from **Table 1 or 5**, *e.g.,* any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 4035-062, 3934, 3833, 3631, 3732, 4338, 4540, 4540-063, 4540-033, 4439, or 4237,

w) Has one or more structural properties of a monoclonal antibody chosen from **Table 1 or 5**, *e.g.,* any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 4035-062, 3934, 3833, 3631, 3732, 4338, 4540, 4540-063, 4540-033, 4439, or 4237, or

x) Has one or more pharmacokinetic properties of a monoclonal antibody chosen from **Table 1 or 5**, *e.g.,* any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 4035-062, 3934, 3833, 3631, 3732, 4338, 4540, 4540-063, 4540-033, 4439, or 4237.

The disclosure features an anti-APRIL antibody molecule, which:

(i) binds, or substantially binds, to human APRIL;

(ii) binds, or substantially binds, to mouse APRIL;

(iii) inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both); and

(iv) inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both).

In an example, the antibody molecule is a synthetic antibody molecule. In an example, the antibody molecule is an isolated antibody molecule.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule binds, or substantially binds, to mouse APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, 10 nM or less, 9 nM or less 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM or between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), *e.g.,* at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10

nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule is an IgG antibody molecule, *e.g.,* comprising a heavy chain constant region of IgG, *e.g.,* chosen from IgG1, IgG2 (*e.g.,* IgG2a), IgG3, or IgG4, *e.g.,* IgG2 or IgG4. In an example, the antibody molecule is an IgG1 antibody molecule, *e.g.,* having an IgG1 constant region described herein. In another example, the antibody molecule is an IgG2 antibody molecule *e.g.,* having an IgG2 constant region described herein. In an example, the antibody molecule comprises a light chain constant region of kappa or lambda light chain.

In an example, the antibody molecule comprises an Fc region. In an example, the Fc region comprises one or more mutations located at the interface between the CH2 and CH3 domains (*e.g.,* to increase the binding affinity to neonatal receptor FcRn and/or the half-life of the antibody molecule). In an example, the Fc region comprises one or more mutations, *e.g.,* one or more (*e.g.,* 2, 3, 4, 5, 6 or all) mutations chosen from T250Q, M252Y, S254T, T256E, M428L, H433K, N434F, or any combination thereof, of IgG1. In an example, the Fc region comprises one or more mutations at positions 233-236 or 322 of human IgG1 or IgG2, or one or more substitutions at positions 327, 330 or 331 of human IgG4 (*e.g.,* to reduce complement-dependent cytotoxicity (CDC)). In an example, the Fc region comprises one or more (*e.g.,* 2, 3, 4, 5, 6, 7 or all) mutations chosen from E233P, L234V, L235A, G236, K322A, A327G, A330S, P331S, or any combination thereof.

In an example, the antibody molecule is a humanized antibody molecule, *e.g.,* comprising one or more framework regions derived from human framework germline sequence. In an example, the antibody molecule comprises a heavy chain variable region (VH) described in **Table 1 or 5**. In an example, the antibody molecule comprises a light chain variable region (VL) described in **Table 1 or 5**. In an example, the antibody molecule comprises a heavy chain variable region (VH) and a light chain variable region (VL) described in **Table 1 or 5**. In an example, the antibody molecule comprises one, two, or three CDRs of a heavy chain variable region (VH) described in **Table 1 or 5.** In an example, the antibody molecule comprises one, two, or three CDRs of a light chain variable region (VL) described in **Table 1 or 5.** In an example, the antibody molecule comprises one, two, or three CDRs of a heavy chain variable region (VH) described in **Table 1 or 5**, and one, two, or three CDRs of a light chain variable region (VL) described in **Table 1 or 5.** In an example, the antibody molecule comprises two heavy chain variable regions and two light chain variable regions. In an example, the antibody molecule is a Fab, F(ab')2, Fv, Fd, or a single chain Fv fragment (scFv).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the

amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 61); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 62); or (ii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 61); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 62); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from,

or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 61); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 62); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 64); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 65); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 64); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 65); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 64); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 65); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 66). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 70).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid

residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 66); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 70). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 66); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 70).

In an example the antibody molecule is monoclonal antibody 3530. In an example, the antibody molecule is a humanized monoclonal antibody 3530.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 61); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 62); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 61); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 62); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 61); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 62); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63), and (ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 64); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid

residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 65); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 64); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 65); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 64); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 65); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3525 (*e.g.*, SEQ ID NO: 66). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3525 (*e.g.*, SEQ ID NO: 50).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3525 (*e.g.*, SEQ ID NO: 66); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3525 (*e.g.*, SEQ ID NO: 50). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3525 (*e.g.*, SEQ ID NO: 66); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3525 (*e.g.*, SEQ ID NO: 50).

In an example the antibody molecule is monoclonal antibody 3525. In an example, the antibody molecule is a humanized monoclonal antibody 3525.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 113); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid

residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 114); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 113); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 114); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises: (i) a VH comprising three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 113); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 114); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115), and (ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 119); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 120); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 119); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 120); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 119); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 120); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3833 (*e.g.*, SEQ ID NO: 121). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3833 (*e.g.*, SEQ ID NO: 122).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid

residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3833 (*e.g.*, SEQ ID NO: 121); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3833 (*e.g.*, SEQ ID NO: 122). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3833 (*e.g.*, SEQ ID NO: 121); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3833 (*e.g.*, SEQ ID NO: 122).

In an example the antibody molecule is monoclonal antibody 3833. In an example, monoclonal antibody 3833 is a humanized monoclonal antibody 3833. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NO: 246-250, a VL comprising the amino acid sequence of any of SEQ ID NO: 251-253, or both.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 123); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 124); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 123); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 124); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises: (i) a VH comprising three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 123); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 124); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125), and (ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 129); an

HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 130); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 129); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 130); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 129); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 130); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3631 (*e.g.*, SEQ ID NO: 131). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3631 (*e.g.*, SEQ ID NO: 132).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3631 (*e.g.*, SEQ ID NO: 131); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3631 (*e.g.*, SEQ ID NO: 132). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3631 (*e.g.*, SEQ ID NO: 131); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3631 (*e.g.*, SEQ ID NO: 132).

In an example the antibody molecule is monoclonal antibody 3631. In an example, the antibody molecule is a humanized monoclonal antibody 3631.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 133); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid

residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 134); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 133); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 134); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises: (i) a VH comprising three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 133); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 134); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135), and (ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 138); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 139); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 138); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 139); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 138); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 139); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3732 (*e.g.*, SEQ ID NO: 140). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3732 (*e.g.*, SEQ ID NO: 141).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid

residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3732 (*e.g.*, SEQ ID NO: 140); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3732 (*e.g.*, SEQ ID NO: 141). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3732 (*e.g.*, SEQ ID NO: 140); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3732 (*e.g.*, SEQ ID NO: 141).

In an example the antibody molecule is monoclonal antibody 3732. In an example, monoclonal antibody 3732 is a humanized monoclonal antibody 3732.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 154); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 155); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 154); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 155); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises: (i) a VH comprising three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 154); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 155); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156), and (ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 159), 4540-063 (*e.g.,* SEQ ID NO: 276), or 4540-033 (*e.g.,* SEQ ID NO: 159); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 160), 4540-063 (*e.g.,* SEQ ID NO: 277), or 4540-033 (*e.g.,* SEQ ID NO: 278); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 159), 4540-063 (*e.g.,* SEQ ID NO: 276), or 4540-033 (*e.g.,* SEQ ID NO: 159); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 160), 4540-063 (*e.g.,* SEQ ID NO: 277), or 4540-033 (*e.g.,* SEQ ID NO: 278); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology

with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises: (i) a VH comprising one, two, or all of the following: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 159), 4540-063 (*e.g.,* SEQ ID NO: 276), or 4540-033 (*e.g.,* SEQ ID NO: 159); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 160), 4540-063 (*e.g.,* SEQ ID NO: 277), or 4540-033 (*e.g.,* SEQ ID NO: 278); or an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156), and (ii) a VL comprising one, two, or all of the following: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 161), 4540-063 (*e.g.*, SEQ ID NO: 258), or 4540-033 (*e.g.*, SEQ ID NO: 256). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 162), 4540-063 (*e.g.*, SEQ ID NO: 261), or 4540-033 (*e.g.*, SEQ ID NO: 261).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid

residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 161), 4540-063 (*e.g.*, SEQ ID NO: 258), or 4540-033 (*e.g.*, SEQ ID NO: 256); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 162), 4540-063 (*e.g.*, SEQ ID NO: 261), or 4540-033 (*e.g.*, SEQ ID NO: 261). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 161), 4540-063 (*e.g.*, SEQ ID NO: 258), or 4540-033 (*e.g.*, SEQ ID NO: 256); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 162), 4540-063 (*e.g.*, SEQ ID NO: 261), or 4540-033 (*e.g.*, SEQ ID NO: 261).

In an example, the antibody molecule is monoclonal antibody 4540, 4540-063, or 4540-033. In an example, monoclonal antibody 4540 is a humanized monoclonal antibody 4540 (*e.g.,* antibodies 4540-063 or 4540-033). In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NO: 254-258, a VL comprising the amino acid sequence of any of SEQ ID NO: 259-261, or both.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in any of **Tables 3-4 or 7-8**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in **Table 3**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from **Table 3**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 3**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises APRIL residues from two monomers, *e.g.,* one or more residues from monomer A and monomer B as shown in **Table 3**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or more, residues within a region of human APRIL as defined in **Table 4**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or all, of the human APRIL residues from **Table 4**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 4**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises one or

more APRIL residues from the C-D loop (*e.g.,* the loop connecting β-sheets C and D), the G-H loop (*e.g.,* the loop connecting β-sheets G and H), or both.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, residues within a region of human APRIL as defined in **Table 7**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, of the human APRIL residues from **Table 7**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 7**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, residues within a region of human APRIL as defined in **Table 8**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from **Table 8**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 8**.

In an example, the antibody molecule binds, or substantially binds, to one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, or all) residues of human APRIL from positions 105-114 and/or one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, or all) residues of mouse APRIL from positions 96-105. In an example, the antibody molecule does not bind, or does not substantially bind, to one, two or all of Asp129, Arg233, or His203 of human APRIL. In an example, the epitope is a conformational epitope.

In an example, binding of the antibody molecule to APRIL (*e.g.,* human APRIL) inhibits, or substantially inhibits, the binding of the CRD2 domain of TACI (*e.g.,* human TACI) to APRIL (*e.g.,* human APRIL). In another example, binding of the antibody molecule to human APRIL, inhibits, or substantially inhibits, the binding of human TACI, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the APRIL residues from **Table 3**. In yet another example, binding of the antibody molecule to human APRIL, inhibits, or substantially inhibits, the binding of human TACI, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or all, of the human APRIL residues from **Table 4**. In still another example, binding of the antibody molecule to human APRIL, inhibits, or substantially inhibits, the binding of human TACI, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, of the human APRIL residues from **Table 7**. In still another example, binding of the antibody molecule to human APRIL, inhibits, or substantially inhibits, the binding of human TACI, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from **Table 8**. In another example, binding of the antibody molecule to human APRIL inhibits, or substantially inhibits, the binding of human BCMA, to one or more, *e.g.*, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,

12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from **Table 8**.

The disclosure features an antibody molecule that binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in any of **Tables 3-4 or 7-8**.

In an example, the anti-APRIL antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, of the human APRIL residues from any of **Tables 3-4 or 7-8**. In an example, the antibody molecule binds, or substantially binds, to a conformational epitope.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in **Table 3**. In an example, the anti-APRIL antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all) of the human APRIL residues from **Table 3.** In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises APRIL residues from two monomers, *e.g.,* one or more residues from monomer A and monomer B as shown in **Table 3**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or all, residues within a region of human APRIL as defined in **Table 4**. In an example, the epitope comprises consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or all of the APRIL residues from **Table 4**. In an example, the epitope comprises or consists of one or more APRIL residues from the C-D loop (*e.g.,* the loop connecting β-sheets C and D), the G-H loop (*e.g.,* the loop connecting β-sheets G and H), or both.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, residues within a region of human APRIL as defined in **Table 7**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, of the human APRIL residues from **Table 7**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 7**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, residues within a region of human APRIL as defined in **Table 8**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from

Table 8. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 8**.

In an example, the antibody molecule binds, or substantially binds, to one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, or all) residues of human APRIL from positions 105-114 and/or one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, or all) residues of mouse APRIL from positions 96-105. In an example, the antibody molecule does not bind, or does not substantially bind, to one, two or all of Asp129, Arg233, or His203 of human APRIL.

In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, or all) of human APRIL residues from **Table 6**.

In an example, the antibody molecule binds, or substantially binds, to one or more (*e.g.,* 2, 3, 4, 5, or all) of the amino acid residues of human APRIL chosen from V174, F176, Q190, R195, R206, or Y208. In an example, the antibody molecule does not binds, or does not substantially bind, to one or more (*e.g.,* 2, 3, or all) of the amino acid residues of human APRIL chosen from V181, S226, I228, or N237. In an example, the antibody molecule binds, or substantially binds, to one or more (*e.g.,* 2, 3, or all) of the amino acid residues of human APRIL chosen from F176, V181, Q190, or I228. In an example, the antibody molecule does not bind, or does not substantially bind, to one or both of the amino acid residues of human APRIL chosen from Y208 or N237. In an example, the antibody molecule binds, or substantially binds, to one or more (*e.g.,* 2, or all) of the amino acid residues of human APRIL chosen from V174, R206, or Y208. In an example, the antibody molecule does not bind, or does not substantially bind, to one or more (*e.g.,* 2, 3, or all) of the amino acid residues of human APRIL chosen from F176, V181, Q190, or N237.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL and mouse APRIL. In an example, the antibody molecule binds, or substantially binds to, human APRIL, but does not bind to mouse APRIL, or binds to mouse APRIL with low affinity.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, *e.g.,* between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule binds, or substantially binds, to mouse APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, *e.g.,* 10 nM

or less, *e.g.,* 9 nM or less 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, *e.g.,* between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule does not bind to mouse APRIL, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both). In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, binding of the antibody molecule to APRIL (*e.g.,* human APRIL) inhibits, or substantially inhibits, the binding of the CRD2 domain of TACI (*e.g.,* human TACI) to APRIL (*e.g.,* human APRIL). In an example, binding of the antibody molecule to human APRIL inhibits, or substantially inhibits, the binding of human TACI, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from **Table 3**. In an example, binding of the antibody molecule to human APRIL, inhibits, or substantially inhibits, the binding of human TACI to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or all, of the human APRIL residues from **Table 4**. In an example, binding of the antibody molecule to human APRIL inhibits, or substantially inhibits, the binding of human TACI, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, of the human APRIL residues from **Table 7**. In an example, binding of the antibody molecule to human APRIL inhibits, or substantially inhibits, the binding of human TACI, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from **Table 8**. In another example, binding of the antibody molecule to human APRIL inhibits, or substantially inhibits, the binding of

human BCMA, to one or more, *e.g.*, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from **Table 8**.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both). In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), *e.g.,* at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule is a synthetic antibody molecule. In an example, the antibody molecule is an isolated antibody molecule. In an example, the antibody molecule is an IgG antibody molecule, *e.g.,* comprising a heavy chain constant region of IgG, *e.g.,* chosen from IgG1, IgG2 (*e.g.,* IgG2a), IgG3, or IgG4, *e.g.,* IgG2 or IgG4. In an example, the antibody molecule is an IgG1 antibody molecule. In an example, the antibody molecule is an IgG2 antibody molecule. In an example, the antibody molecule comprises a light chain constant region of kappa or lambda light chain.

In an example, the antibody molecule comprises an Fc region. In an example, the Fc region comprises one or more mutations located at the interface between the CH2 and CH3 domains (*e.g.,* to increase the binding affinity to neonatal receptor FcRn and/or the half-life of the antibody molecule). In an example, the Fc region comprises one or more mutations, *e.g.,* one or more (*e.g.,* 2, 3, 4, 6 or all) mutations chosen from T250Q, M252Y, S254T, T256E, M428L, H433K, N434F, or any combination thereof, of IgG1. In an example, the Fc region comprises one or more mutations at positions 233-236 or 322 of human IgG1 or IgG2, or one or more substitutions at positions 327, 330 or 331 of human IgG4 (*e.g.,* to reduce complement-dependent cytotoxicity (CDC)). In an example, the Fc region comprises one or more (*e.g.,* 2, 3, 4, 6 7 or all) mutations chosen from E233P, L234V, L235A, G236, K322A, A327G, A330S, P331S, or any combination thereof.

In an example, the antibody molecule is a humanized antibody molecule, *e.g.,* as described in **Table 1 or 5**, *e.g.,* comprising one or more framework regions derived from human framework germline sequence.

In an example, the antibody molecule comprises two heavy chain variable regions and two light chain variable regions. In an example, the antibody molecule is a Fab, F(ab')2, Fv, Fd, or a single chain Fv fragment (scFv).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 1); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 2); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 3).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 4); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 5); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 6).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 1); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 2); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 3), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2218 (*e.g.,*

SEQ ID NO: 4); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 5); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 6).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 1); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 2); and an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 3), and (ii) a VL comprising: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 4); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 5); and an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 6).

In an example, the antibody molecule comprises a VH comprising one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 7); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 8); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 3).

In an example, the antibody molecule comprises a VL comprising one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 4); (ii) an LCDR2

comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 5); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 6).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 7); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 8); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 3), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 4); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 5); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 6).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 7); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 8); and an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 3), and (ii) a VL comprising: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 4); an LCDR2 comprising

an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 5); and an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 6).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 9). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 10).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 9); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 10). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 9); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 10).

In an example the antibody molecule is monoclonal antibody 2218. In an example, monoclonal antibody 2218 is a humanized monoclonal antibody 2218. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NO: 190-201, a VL comprising the amino acid sequence of any of SEQ ID NO: 202-208, or both.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 11) or a 2419-related antibody; (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 12) or a 2419-related

antibody; or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 13) or a 2419-related antibody.

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 14) or a 2419-related antibody; (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 15) or a 2419-related antibody; or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 16) or a 2419-related antibody.

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 11) or a 2419-related antibody; an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 12) or a 2419-related antibody; or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 13) or a 2419-related antibody, and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 14) or a 2419-related antibody; an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 15) or a 2419-related antibody; or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology

with, the amino acid sequence of the LCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 16) or a 2419-related antibody.

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 11) or a 2419-related antibody; an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 12) or a 2419-related antibody; or an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 13) or a 2419-related antibody, and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 14) or a 2419-related antibody; an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 15) or a 2419-related antibody; and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 16) or a 2419-related antibody.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 17) or a 2419-related antibody; (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 18) or a 2419-related antibody; or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 13) or a 2419-related antibody.

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 14) or a 2419-related antibody; (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 15) or a 2419-related antibody; or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid

sequence of the LCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 16) or a 2419-related antibody.

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 17) or a 2419-related antibody; an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 18) or a 2419-related antibody; or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 13) or a 2419-related antibody, and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 14) or a 2419-related antibody; an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 15) or a 2419-related antibody; or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 16) or a 2419-related antibody.

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 17) or a 2419-related antibody; an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 18) or a 2419-related antibody; or an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 13) or a 2419-related antibody, and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 14) or a 2419-related antibody; an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 15) or a 2419-related antibody; and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 16) or a 2419-related antibody.

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid

sequence of the VH of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 19) or a 2419-related antibody. In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 20) or a 2419-related antibody.

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 19) or a 2419-related antibody; and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 20) or a 2419-related antibody.

In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 19) or a 2419-related antibody; and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 20) or a 2419-related antibody.

In an example the antibody molecule is monoclonal antibody 2419. In an example, monoclonal antibody 2419 is a humanized monoclonal antibody 2419. In an example, the antibody molecule is a 2419-related antibody molecule, *e.g.,* any of antibodies 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, or 2419-1406, *e.g.,* as disclosed in **Table 1 or 5**. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NOS: 209-214, 283, 288, 289, 291, 292, 294, 296, or 317, a VL comprising the amino acid sequence of any of SEQ ID NOS: 215-219, 284, 286, 295, or 316, or both.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 21); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 32); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least

85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 33).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 34); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 35); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 36).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 21); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 32); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 33), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 34); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 35); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 36).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 21); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 32); and an HCDR3 comprising the amino acid sequence of the HCDR3 of

monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 33), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 34); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 35); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 36).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 37); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 38); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 33).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 34); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 35); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 36).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 37); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 38); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from,

or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 33), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 34); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 35); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 36).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 37); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 38); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 33), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 34); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 35); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 36).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 39). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 40).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 39); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 40). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the

VH of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 39); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 40).

In an example the antibody molecule is monoclonal antibody 2922. In an example, the antibody molecule is a humanized monoclonal antibody 2922.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 51); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 52); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 53).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 54); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 55); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 56).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 51); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 52); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from,

or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 53), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 54); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 55); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 56).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 51); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 52); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 53), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 54); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 55); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 56).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 57); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 58); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 53).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino

acid sequence of the LCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 54); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 55); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 56).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 57); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 58); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 53), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 54); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 55); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 56).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 57); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 58); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 53), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 54); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 55); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 56).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid

residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 59). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 60).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 59); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 60). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 59); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 60).

In an example the antibody molecule is monoclonal antibody 3327. In an example, the antibody molecule is a humanized monoclonal antibody 3327.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 61); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 62); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); (ii) an LCDR2

comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 61); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 62); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 61); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 62); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one,

two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 64); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 65); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 64); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 65); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); or an LCDR3

comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 64); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 65); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 66). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 70).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 66); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 70). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 66); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 70).

In an example the antibody molecule is monoclonal antibody 3530. In an example, the antibody molecule is a humanized monoclonal antibody 3530.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more

than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 61); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 62); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 61); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 62); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63), and

(ii) a VL comprising: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100%

homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 61); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 62); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 64); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 65); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 64); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 65); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 64); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 65); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 66). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 50).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid

residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 66); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 50). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 66); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 50).

In an example the antibody molecule is monoclonal antibody 3525. In an example, the antibody molecule is a humanized monoclonal antibody 3525.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 21); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 22); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 23).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 24); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 25); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 26).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 21); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 22); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 23), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 24); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 25); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 26).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 21); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 22); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 23), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 24); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 25); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 26).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 27); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 28); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least

85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 23).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 24); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 25); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 26).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 27); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 28); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 23), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 24); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 25); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 26).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 27); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 28); and an HCDR3 comprising the amino acid sequence of the HCDR3 of

monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 23), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 24); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 25); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 26).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 29). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 30).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 29); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 30). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 29); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 30).

In an example the antibody molecule is monoclonal antibody 2621. In an example, the antibody molecule is a humanized monoclonal antibody 2621.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 11); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 42); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least

85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 43).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 44); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 11); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 42); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 43), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 11); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 42); and an HCDR3 comprising the amino acid sequence of the HCDR3 of

monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 43), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 47); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 48); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 43).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 44); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 45); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 47); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 48); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from,

or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 43), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO:45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 47); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 48); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 43), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 45); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 49). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 50).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 49); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 50). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the

VH of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 49); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 50).

In an example the antibody molecule is monoclonal antibody 3125. In an example, the antibody molecule is a humanized monoclonal antibody 3125.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 93); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 94); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 95).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 96); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 97); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 98).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 93); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 94); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino

acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 95), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 96); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 97); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 98).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 93); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 94); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 95), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 96); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 97); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 98).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 99); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 100) or 4035-062 (*e.g.,* SEQ ID NO: 273); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 95).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than

1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 96); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 97); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 98).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 99); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 100) or 4035-062 (*e.g.,* SEQ ID NO: 273); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 95), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 96); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 97); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 98).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 99); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 100) or 4035-062 (*e.g.,* SEQ ID NO: 273); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 95), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 96); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO:

97); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4035 or 4035-062 (*e.g.,* SEQ ID NO: 98).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 101) or 4035-062 (*e.g.,* SEQ ID NO: 225). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 102) or 4035-062 (*e.g.,* SEQ ID NO: 229).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 101) or 4035-062 (*e.g.,* SEQ ID NO: 225); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 102) or 4035-062 (*e.g.,* SEQ ID NO: 229). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 101) or 4035-062 (*e.g.,* SEQ ID NO: 225); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 102) or 4035-062 (*e.g.,* SEQ ID NO: 229).

In an example, the antibody molecule is monoclonal antibody 4035. In an example, monoclonal antibody 4035 is a humanized monoclonal antibody 4035 (*e.g.,* antibody 4035-062). In another example, the antibody molecule is antibody 4035-062. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NOS: 220-227 or 262-265, a VL comprising the amino acid sequence of any of SEQ ID NOS: 228-234, or both.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 103); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the

HCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 104); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 105).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 106); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 107); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 108).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 103); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 104); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 105), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 106); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 107); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 108).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO:

103); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 104); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 105), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 106); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 107); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 108).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 109); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 110); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 105).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 106); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 107); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 108).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 109); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid

sequence of the HCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 110); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 105), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 106); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 107); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 108).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 109); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 110); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 105), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 106); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 107); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 108).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 111). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 112).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 111); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 112). In an

example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 111); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 112).

In an example the antibody molecule is monoclonal antibody 3934. In an example, the antibody molecule is a humanized monoclonal antibody 3934.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 112); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 113); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 114).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 113); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 114); or an HCDR3

comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 113); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 114); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 119); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 120); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than

1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 119); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 120); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 119); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 120); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 121). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 122).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 121); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 122). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 121); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 122).

In an example the antibody molecule is monoclonal antibody 3833. In an example, monoclonal antibody 3833 is a humanized monoclonal antibody 3833. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NO: 246-250, a VL comprising the amino acid sequence of any of SEQ ID NO: 251-253, or both.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 123); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 124); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining

regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 123); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 124); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 123); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 124); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ

ID NO: 127); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 129); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 130); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 129); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 130); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO:45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 129); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 130); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 131). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 132).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 131); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 132). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 131); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 132).

In an example the antibody molecule is monoclonal antibody 3631. In an example, the antibody molecule is a humanized monoclonal antibody 3631.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 133); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 134); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 133); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 134); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 133); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 134); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 138); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 139); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from,

or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 138); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 139); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 138); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 139); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 140). In an example, the

antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 141).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 140); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 141). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 140); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 141).

In an example the antibody molecule is monoclonal antibody 3732. In an example, the antibody molecule is a humanized monoclonal antibody 3732.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 11); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 142); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 143).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 144 or 146); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the

LCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 107 or 147); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 145 or 148).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 11); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 142); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 143), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 144 or 146); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 107 or 147); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 145 or 148).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 11); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 142); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 143), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 144 or 146); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 107 or 147); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 145 or 148).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the

amino acid sequence of the HCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 149); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 150); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 143).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 144 or 146); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 107 or 147); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 145 or 148).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 149); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 150); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 143), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 144 or 146); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO:107 or 147); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid

residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 145 or 148).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 149); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 150); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 143), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 144 or 146); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 107 or 147); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 145 or 148).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 151). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 152 or 153).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 151); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 152 or 153). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 150); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 152 or 153).

In an example the antibody molecule is monoclonal antibody 4338. In an example, the antibody molecule is a humanized monoclonal antibody 4338.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the

amino acid sequence of the HCDR1 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 154); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 155); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 154); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 155); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid

residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises: (i) a VH comprising three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises: an HCDR1 comprises the amino acid sequence of the HCDR1 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 154); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 155); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156), and (ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 159), 4540-063 (*e.g.,* SEQ ID NO: 276), or 4540-033 (*e.g.,* SEQ ID NO: 159); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 160), 4540-063 (*e.g.,* SEQ ID NO: 277), or 4540-033 (*e.g.,* SEQ ID NO: 278); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two,

or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 159), 4540-063 (*e.g.,* SEQ ID NO: 276), or 4540-033 (*e.g.,* SEQ ID NO: 159); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 160), 4540-063 (*e.g.,* SEQ ID NO: 277), or 4540-033 (*e.g.,* SEQ ID NO: 278); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises: (i) a VH comprising one, two, or all of the following: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 159), 4540-063 (*e.g.,* SEQ ID NO: 276), or 4540-033 (*e.g.,* SEQ ID NO: 159); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody

4540 (*e.g.,* SEQ ID NO: 160), 4540-063 (*e.g.,* SEQ ID NO: 277), or 4540-033 (*e.g.,* SEQ ID NO: 278); or an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 156), and (ii) a VL comprising one, two, or all of the following: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116), 4540-063 (*e.g.,* SEQ ID NO: 274), or 4540-033 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157), 4540-063 (*e.g.,* SEQ ID NO: 275), or 4540-033 (*e.g.,* SEQ ID NO: 275); or an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4540, 4540-063, or 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 161), 4540-063 (*e.g.*, SEQ ID NO: 258), or 4540-033 (*e.g.*, SEQ ID NO: 256). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 162), 4540-063 (*e.g.*, SEQ ID NO: 261), or 4540-033 (*e.g.*, SEQ ID NO: 261).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 161), 4540-063 (*e.g.*, SEQ ID NO: 258), or 4540-033 (*e.g.*, SEQ ID NO: 256); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 162), 4540-063 (*e.g.*, SEQ ID NO: 261), or 4540-033 (*e.g.*, SEQ ID NO: 261). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 161), 4540-063 (*e.g.*, SEQ ID NO: 258), or 4540-033 (*e.g.*, SEQ ID NO: 256); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 4540 (*e.g.*, SEQ ID NO: 162), 4540-063 (*e.g.*, SEQ ID NO: 261), or 4540-033 (*e.g.*, SEQ ID NO: 261).

In an example the antibody molecule is monoclonal antibody 4540, 4540-063, or 4540-033. In an example, monoclonal antibody 4540 is a humanized monoclonal antibody 4540 (*e.g.,* antibodies 4540-063 or 4540-033). In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NOS: 254-258, a VL comprising the amino acid sequence of any of SEQ ID NOS: 259-261, or both.

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 163); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 164); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 165).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 166); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 167); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 168).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 163); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 164); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 165), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4237 (*e.g.,*

SEQ ID NO: 166); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 167); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 168).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 163); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 164); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 165), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 166); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 167); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 168).

In an example, the antibody molecule comprises a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: (i) an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 169); (ii) an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 170); or (iii) an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 165).

In an example, the antibody molecule comprises a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: (i) an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 166); (ii) an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 167); or (iii) an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99

or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 168).

In an example, the antibody molecule comprises:

(i) a VH comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 169); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 170); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 165), and

(ii) a VL comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 166); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 167); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 168).

In an example, the antibody molecule comprises: (i) a VH comprising: an HCDR1 comprising the amino acid sequence of the HCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 169); an HCDR2 comprising the amino acid sequence of the HCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 170); and an HCDR3 comprising the amino acid sequence of the HCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 165), and (ii) a VL comprising: an LCDR1 comprising the amino acid sequence of the LCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 166); an LCDR2 comprising the amino acid sequence of the LCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 167); and an LCDR3 comprising the amino acid sequence of the LCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 168).

In an example, the antibody molecule comprises a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 171). In an example, the antibody molecule comprises a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96,

97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 172).

In an example, the antibody molecule comprises: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 171); and (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 172). In an example, the antibody molecule comprises: (i) a VH comprising the amino acid sequence of the VH of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 171); and (ii) a VL comprising the amino acid sequence of the VL of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 172).

In an example the antibody molecule is monoclonal antibody 4237. In an example, monoclonal antibody 4237 is a humanized monoclonal antibody 4237. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NOS: 235-240, a VL comprising the amino acid sequence of any of SEQ ID NOS: 241-245, or both.

The disclosure features an anti-APRIL antibody molecule, which:

(i) binds, or substantially binds, to human APRIL;

(ii) inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both);

(iii) inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both); and

(iv) binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in any of **Tables 3-4 or 7-8**.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule does not bind to mouse APRIL, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), *e.g.,* at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises APRIL residues from two monomers, *e.g.,* one or more residues from monomer A and monomer B as shown in **Table 3**. In an example, the antibody molecule binds, or substantially binds, to one or more APRIL residues from the C-D loop (*e.g.,* the loop connecting β-sheets C and D), the G-H loop (*e.g.,* the loop connecting β-sheets G and H), or both. In an example, the antibody molecule binds, or substantially binds, to one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, or all) residues of human APRIL from positions 105-114 and/or one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, or all) residues of mouse APRIL from positions 96-105. In an example, the antibody molecule does not bind, or binds with low affinity, to one, two or all of Asp129, Arg233, or His203 of human APRIL.

In an example, the antibody molecule comprises one or both of:

(i) a heavy chain variable region (VH) comprising one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of a monoclonal antibody chosen from antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3125, 2621, 4035, 4035-062, 3934, 4338, 4439, or

4237; an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of the (same) monoclonal antibody; or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of the (same) monoclonal antibody, or

(ii) a light chain variable region (VL) comprising one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of the (same) monoclonal antibody; an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of the (same) monoclonal antibody; or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of the (same) monoclonal antibody.

In an example, the antibody molecule comprises one or both of:

(i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of a monoclonal antibody chosen from antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3125, 2621, 4035, 4035-062, 3934, 4338, 4439, or 4237; or

(ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of the (same) monoclonal antibody.

In an example, the antibody molecule is a synthetic antibody molecule. In an example, the antibody molecule is an isolated antibody molecule. In an example, the antibody molecule is a humanized antibody molecule, *e.g.,* comprising one or more framework regions derived from human framework germline sequence.

In an example, the antibody molecule is an IgG antibody molecule, *e.g.,* comprising a heavy chain constant region of IgG, *e.g.,* chosen from IgG1, IgG2 (*e.g.,* IgG2a), IgG3, or IgG4, *e.g.,* IgG2 or IgG4. In an example, the antibody molecule is an IgG1 antibody molecule. In an example, the antibody molecule is an IgG2 antibody molecule. In an example, the antibody molecule comprises a light chain constant region of kappa or lambda light chain.

In an example, the antibody molecule comprises an Fc region. In an example, the Fc region comprises one or more mutations located at the interface between the CH2 and CH3 domains (*e.g.,* to increase the binding affinity to neonatal receptor FcRn and/or the half-life of the antibody molecule). In an example, the Fc region comprises one or more mutations, *e.g.,* one or more (*e.g.,*

2, 3, 4, 6 or all) mutations chosen from T250Q, M252Y, S254T, T256E, M428L, H433K, N434F, or any combination thereof, of IgG1. In an example, the Fc region comprises one or more mutations at positions 233-236 or 322 of human IgG1 or IgG2, or one or more substitutions at positions 327, 330 or 331 of human IgG4 (*e.g.,* to reduce complement-dependent cytotoxicity (CDC)). In an example, the Fc region comprises one or more (*e.g.,* 2, 3, 4, 6 7 or all) mutations chosen from E233P, L234V, L235A, G236, K322A, A327G, A330S, P331S, or any combination thereof.

In an example, the antibody molecule comprises two heavy chain variable regions and two light chain variable regions. In an example, the antibody molecule is a Fab, F(ab')2, Fv, Fd, or a single chain Fv fragment (scFv).

The disclosure features an anti-APRIL antibody, which:

a) competes for binding to APRIL with an antibody molecule comprising the heavy chain complementary determining regions (HCDR1, HCDR2 and HCDR3) and the light chain complementary determining regions (LCDR1, LCDR2 and LCDR3) of any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 4035-062, 3934, 3833, 3631, 3732, 4338, 4540, 4540-063, 4540-033, 4439, or 4237, *e.g.,* as described in **Table 1 or 5**; or

b) binds, or substantially binds, to an epitope that completely or partially overlaps with the epitope of an antibody molecule comprising the heavy chain complementary determining regions (HCDR1, HCDR2 and HCDR3) and the light chain complementary determining regions (LCDR1, LCDR2 and LCDR3) of any of monoclonal antibodies 2218 (*e.g.,* SEQ ID NOS: 1-6 according to Chothia numbering or SEQ ID NOS: 3-8 according to Kabat numbering), 2419 (*e.g.,* SEQ ID NOS: 11-16 according to Chothia numbering or SEQ ID NOS: 13-18 according to Kabat numbering), 2419-0105 (*e.g.,* SEQ ID NOS: 11-13, 16, 280 and 281 according to Chothia numbering or SEQ ID NOS: 13, 16, 17 and 280-282 according to Kabat numbering), 2419-0205 (*e.g.,* SEQ ID NOS: 11-13, 16, 280 and 281 according to Chothia numbering or SEQ ID NOS: 13, 16, 17 and 280-282 according to Kabat numbering), 2419-0206 (*e.g.,* SEQ ID NOS: 11-13, 16, 280 and 285 according to Chothia numbering or SEQ ID NOS: 13, 16, 17, 280, 282 and 285 according to Kabat numbering), 2419-0406 (*e.g.,* SEQ ID NOS: 11-13, 16, 280 and 285 according to Chothia numbering or SEQ ID NOS: 13, 16, 17, 280, 285 and 290 according to Kabat numbering), 2419-0605 (*e.g.,* SEQ ID NOS: 11-13, 16, 280 and 281 according to Chothia numbering or SEQ ID NOS: 13, 16, 17 and 280-282 according to Kabat numbering), 2419-0805 (*e.g.,* SEQ ID NOS: 11-13, 16, 280 and 281 according to Chothia numbering or SEQ ID NOS: 13, 16, 17, 280, 281 and 287 according to Kabat numbering), 2419-0806 (*e.g.,* SEQ ID NOS: 11-13, 16, 280 and 285 according to Chothia numbering or SEQ ID NOS: 13, 16, 17, 280, 285 and 287 according to Kabat numbering), 2419-1204 (*e.g.,* SEQ ID NOS: 11-13, 16, 280 and 293 according to Chothia numbering or SEQ ID NOS: 13, 16, 17, 280, 282 and 293 according to Kabat

In an example, the antibody molecule is a synthetic antibody molecule. In an example, the antibody molecule is an isolated antibody molecule.

In an example, the antibody molecule competes for binding with two, three, four, five, six, seven, eight, nine, ten, or more of the antibody molecules that comprise the HCDR1, HCDR2, HCDR3, LCDR1, LCDR2, and LCDR3 of any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 4035-062, 3934, 3833, 3631, 3732, 4338, 4540, 4540-063, 4540-033, 4439, or 4237.

In an example, the antibody molecule binds, or substantially binds, to an epitope that completely or partially overlaps with the epitopes of two, three, four, five, six, seven, eight, nine, ten, or more of the antibody molecules that comprise the HCDR1, HCDR2, HCDR3, LCDR1, LCDR2, and LCDR3 of any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 4035-062, 3934, 3833, 3631, 3732, 4338, 4540, 4540-063, 4540-033, 4439, or 4237.

In an example, the antibody molecule that comprises the HCDR1, HCDR2, HCDR3, LCDR1, LCDR2, and LCDR3 of any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 3934, 3833, 3631, 3732, 4338, 4540, 4439, or 4237 comprises a heavy chain variable region and a light chain variable region of any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 3934, 3833, 3631, 3732, 4338, 4540, 4439, or 4237.

In an example, the antibody molecule that comprises the HCDR1, HCDR2, HCDR3, LCDR1, LCDR2, and LCDR3 of any of monoclonal antibodies 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 3934, 3833, 3631, 3732, 4338, 4540, 4439, or 4237 is monoclonal antibody 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 3934, 3833, 3631, 3732, 4338, 4540, 4439, or 4237.

In an example, the antibody molecule is a humanized monoclonal antibody 2218, 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, 2419-1406, 2922, 3327, 3530, 3525, 3125, 2621, 4035, 4035-062, 3934, 3833, 3631, 3732, 4338, 4540, 4540-063, 4540-033, 4439, or 4237. In an example, the antibody molecule comprises a heavy chain variable region (VH) having an

amino acid sequence described in **Table 1 or 5**. In an example, the antibody molecule comprises a light chain variable region (VL) having an amino acid sequence described in **Table 1 or 5**. In antibody molecule comprises a heavy chain variable region (VH) having an amino acid sequence described in **Table 1 or 5** and a light chain variable region (VL) having an amino acid sequence described in **Table 1 or 5**.

In an example, the antibody molecule competes for binding to human APRIL, mouse APRIL, or both. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, *e.g.,* between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule binds, or substantially binds, to mouse APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, *e.g.,* between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), or both.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or

less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, binding of the antibody molecule to APRIL (*e.g.,* human APRIL) inhibits, or substantially inhibits, the binding of the CRD2 domain of TACI (*e.g.,* human TACI) to APRIL (*e.g.,* human APRIL).

In an example, binding of the antibody molecule to human APRIL inhibits, or substantially inhibits, the binding of human TACI, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all of the human APRIL residues from **Table 3**. In an example, binding of the antibody molecule to human APRIL, inhibits, or substantially inhibits, the binding of human TACI to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or all of the human APRIL residues from **Table 4**. In an example, binding of the antibody molecule to human APRIL, inhibits, or substantially inhibits, the binding of human TACI to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all of the human APRIL residues from **Table 7**. In an example, binding of the antibody molecule to human APRIL, inhibits, or substantially inhibits, the binding of human TACI to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all of the human APRIL residues from **Table 8**.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both).

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), *e.g.,* at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule does not inhibit, or does not substantially inhibit, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both).

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in any of **Tables 3-4 or 7-8**. In an example, the antibody molecule binds, or substantially binds, to a conformational epitope.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in **Table 3**. In an example, the antibody molecule binds to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all of the human APRIL residues from **Table 3**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises APRIL residues from two monomers, *e.g.,* one or more residues from monomer A and monomer B as shown in **Table 3**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or more, residues within a region of human APRIL as defined in **Table 4**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises consists of one or more, *e.g.,*2, 3, 4, 5, 6, 7, 8, 9, 10, or all of the APRIL residues from **Table 4**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises one or more APRIL residues from the C-D loop (*e.g.,* the loop connecting β-sheets C and D), the G-H loop (*e.g.,* the loop connecting β-sheets G and H), or both.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, residues within a region of human APRIL as defined in **Table 7**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, of the human APRIL residues from **Table 7**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 7**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, residues within a region of human APRIL as defined in **Table 8**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from **Table 8**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 8**.

In an example, the antibody molecule binds, or substantially binds, to one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, or all) residues of human APRIL from positions 105-114 and/or one or more (*e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, or all) residues of mouse APRIL from positions 96-105. In an example, the antibody molecule does not bind, or does not substantially bind, to one, two or all of Asp129, Arg233, or His203 of human APRIL.

In an example, the antibody molecule is an IgG antibody molecule, *e.g.,* comprising a heavy chain constant region of IgG, *e.g.,* chosen from IgG1, IgG2 (*e.g.,* IgG2a), IgG3, or IgG4, *e.g.,* IgG2 or IgG4. In an example, the antibody molecule is an IgG1 antibody molecule. In another

example, the antibody molecule is an IgG2 antibody molecule. In an example, the antibody molecule comprises a light chain constant region of kappa or lambda light chain.

In an example, the antibody molecule comprises an Fc region. In an example, the Fc region comprises one or more mutations located at the interface between the CH2 and CH3 domains (*e.g.,* to increase the binding affinity to neonatal receptor FcRn and/or the half-life of the antibody molecule). In an example, the Fc region comprises one or more mutations, *e.g.,* one or more (*e.g.,* 2, 3, 4, 6 or all) mutations chosen from T250Q, M252Y, S254T, T256E, M428L, H433K, N434F, or any combination thereof, of IgG1. In an example, the Fc region comprises one or more mutations at positions 233-236 or 322 of human IgG1 or IgG2, or one or more substitutions at positions 327, 330 or 331 of human IgG4 (*e.g.,* to reduce complement-dependent cytotoxicity (CDC)). In an example, the Fc region comprises one or more (*e.g.,* 2, 3, 4, 6 7 or all) mutations chosen from E233P, L234V, L235A, G236, K322A, A327G, A330S, P331S, or any combination thereof.

In an example, the antibody molecule is a humanized antibody molecule, *e.g.,* comprising one or more framework regions derived from human framework germline sequence. In an example, the antibody molecule comprises two heavy chain variable regions and two light chain variable regions. In an example, the antibody molecule is a Fab, F(ab')2, Fv, Fd, or a single chain Fv fragment (scFv).

The disclosure features an anti-APRIL antibody molecule described herein, *e.g.,* a synthetic or isolated anti-APRIL antibody molecule described herein.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 1 or 7); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 2 or 8); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 3), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2218

(*e.g.,* SEQ ID NO: 4); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 5); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 6).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 9); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2218 (*e.g.,* SEQ ID NO: 10).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 71 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 72 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 2218. In an example, monoclonal antibody 2218 is humanized monoclonal antibody 2218. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NO: 190-201, a VL comprising the amino acid sequence of any of SEQ ID NO: 202-208, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 1 nM or less, *e.g.,* about 0.6 nM. In an example, the antibody molecule does not bind to mouse APRIL, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 1 nM or less, *e.g.,* about 0.74 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 0.5 nM or less, *e.g.,* about 0.22 nM.

In an example, the antibody molecule comprises one or both of:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence of G-Y-T-F-T-D-Y (SEQ ID NO: 11); an HCDR2 comprising an amino acid sequence of Y-P-L-R-G-S (SEQ ID NO: 12); or an HCCDR3 comprising an amino acid sequence of H-G-A-Y-Y-S-N-A-F-D-Y (SEQ ID NO: 13), or

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence of X1-X2-S-X4-S-V-D-N-D-G-I-R-F-X14-H (SEQ ID NO: 327), wherein X1 is R or K; X2 is A or S; X4 is E or Q; and X14 is M or L; an LCDR2 comprising an amino acid sequence of R-A-S-X4-X5-X6-X7 (SEQ ID NO: 328), wherein X4 is N or T; X5 is L or R; X6 is E or A; and X7 is S or T; or an LCDR3 comprising an amino acid sequence of Q-Q-S-N-K-D-P-Y-T (SEQ ID NO: 16).

In another example, the antibody molecule comprises one or both of:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence of D-Y-T-I-H (SEQ ID NO: 17); an HCDR2 comprising an amino acid sequence of W-I-Y-P-L-R-G-S-I-N-Y-X12-X13-X14-F-X16-X17 (SEQ ID NO: 329), wherein X12 is N, S, or A, X13 is E, P, or Q; X14 is K or S; X16 is K or Q; and X17 is D or G; or an HCCDR3 comprising an amino acid sequence of H-G-A-Y-Y-S-N-A-F-D-Y (SEQ ID NO: 13), or

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence of X1-X2-S-X4-S-V-D-N-D-G-I-R-F-X14-H (SEQ ID NO: 327), wherein X1 is R or K; X2 is A or S; X4 is E or Q; and X14 is M or L; an LCDR2 comprising an amino acid sequence of R-A-S-X4-X5-X6-X7 (SEQ ID NO: 328), wherein X4 is N or T; X5 is L or R; X6 is E or A; and X7 is S or T; or an LCDR3 comprising an amino acid sequence of Q-Q-S-N-K-D-P-Y-T (SEQ ID NO: 16).

In an example, the antibody molecule is any of antibodies 2419, 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, or 2419-1406.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 0.01 nM or less, *e.g.,* about 0.001-0.005 nM or 0.002-0.004 nM, *e.g.,* about 0.001, 0.002, 0.003, 0.004, or 0.005 nM. In an example, the antibody molecule does not bind to mouse APRIL, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1

nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 0.5 nM or less, *e.g.,* about 0.1-0.5 nM or 0.2-0.4 nM, *e.g.,* about 0.1, 0.2, 0.3, 0.4, or 0.5 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 0.5 nM or less, *e.g.,* about 0.1-0.5 nM or 0.2-0.4 nM, *e.g.,* about 0.1, 0.2, 0.3, 0.4, or 0.5 nM.

In another example, the antibody molecule comprises (i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 11 or 17); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 12 or 18); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 13), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 14); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino

acid sequence of the LCDR2 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 15); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 16).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 19); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2419 (*e.g.,* SEQ ID NO: 20).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 73 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 74 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 2419. In an example, monoclonal antibody 2419 is humanized monoclonal antibody 2419. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NOS: 209-214, a VL comprising the amino acid sequence of any of SEQ ID NOS: 215-219, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 1 nM or less, *e.g.,* about 0.8 nM, about 0.003 nM, or about 0.002 nM. In an example, the antibody molecule does not bind, or bind to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 500 nM or more.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1

nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 1 nM or less, *e.g.,* about 0.74 nM, about 0.4 nM, 0.3 nM, or 0.2 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 5 nM or less, *e.g.,* about 4 nM, about 2 nM, or about 1 nM, or 0.5 nM or less, *e.g.,* about 0.22 nM, about 1 nM, about 0.7 nM, about 0.3 nM, about 0.2 nM, or about 0.1 nM.

In another example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of a 2419-related antibody (*e.g.,* SEQ ID NO: 11 or 17); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of the 2419-related antibody (*e.g.,* SEQ ID NOS: 12, 282, 287, or 290); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of the 2419-related antibody (*e.g.,* SEQ ID NO: 13), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of the 2419-related antibody (*e.g.,* SEQ ID NOS: 280 or 314); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with,

the amino acid sequence of the LCDR2 of the 2419-related antibody (*e.g.,* SEQ ID NOS: 281, 285, 293, or 315); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of the 2419-related antibody (*e.g.,* SEQ ID NO: 16).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of the 2419-related antibody (*e.g.,* SEQ ID NOS: 283, 288, 289, 291, 292, 294, 296, or 317); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of the 2419-related antibody (*e.g.,* SEQ ID NOS: 284, 286, 295, or 316).

In an example, the antibody molecule comprises a VH encoded by the VH nucleotide sequence of the 2419-related antibody (*e.g.,* SEQ ID NOS: 304, 307, 308, 309, 310, 311, 313, or 319) (or a nucleotide sequence substantially identical thereto) or a VL encoded by the VL nucleotide sequence of the 2419-related antibody (*e.g.,* SEQ ID NOS: 305, 306, 312, or 318) (or a nucleotide sequence substantially identical thereto), or both.

In an example, the 2419-related antibody molecule is chosen from antibodies 2419-0105, 2419-0205, 2419-0206, 2419-0406, 2419-0605, 2419-0805, 2419-0806, 2419-1204, 2419-1205, 2419-1210, 2419-1305, 2419-1306, 2419-1310, or 2419-1406. In an example, the 2419-related antibody is humanized antibody molecule. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NOS: 209-214, 283, 288, 289, 291, 292, 294, 296, or 317, a VL comprising the amino acid sequence of any of SEQ ID NOS: 215-219, 284, 286, 295, or 316, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, *e.g.,* between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 1 nM or less, *e.g.,* about 0.8 nM, about 0.003 nM, or about 0.002 nM.

In an example, the antibody molecule does not bind, or bind to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 500 nM or more.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 1 nM or less, *e.g.,* about 0.74 nM, about 0.4 nM, 0.3 nM, or 0.2 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 5 nM or less, *e.g.,* about 4 nM, about 2 nM, or about 1 nM, or 0.5 nM or less, *e.g.,* about 0.22 nM, about 1 nM, about 0.7 nM, about 0.3 nM, about 0.2 nM, or about 0.1 nM.

In another example, the antibody molecule comprises (i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 21 or 37); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 32 or 38); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 33), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2922 (*e.g.*, SEQ ID NO: 34); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2922 (*e.g.*, SEQ ID NO: 35); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2922 (*e.g.*, SEQ ID NO: 36).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 39); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2922 (*e.g.,* SEQ ID NO: 40).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 77 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 78 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 2922. In an example, the antibody molecule is humanized monoclonal antibody 2922.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 5 nM or less, *e.g.,* about 3.3 nM. In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 50 nM or less, *e.g.,* about 31.64 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the IC_{50} is 50 nM or less. In an example, the antibody molecule inhibits binding of human TACI to human BCMA at an IC_{50} of 25 nM or less, *e.g.,* about 21.96 nM.

In another example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 51 or 57); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 52 or 58); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 53), and

(ii) a light chain variable region (VH), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 54); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 55); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 56).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 59); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3327 (*e.g.,* SEQ ID NO: 60).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 81 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 82 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 3327. In an example, the antibody molecule is humanized antibody 3327.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, 10 nM or less, 9 nM or less 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM or between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 3.16 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the IC_{50} is 50 nM or less. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 5 nM or less, *e.g.,* about 2.35 nM.

In another example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 93 or 99); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 94 or 100); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 95), and

(ii) a light chain variable region (VH), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 96); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 97); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 98).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 101); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4035 (*e.g.,* SEQ ID NO: 102).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 173 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 174 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 4035. In an example, monoclonal antibody 4035 is humanized monoclonal antibody 4035. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NO: 220-227 or 262-265, a VL comprising the amino acid sequence of any of SEQ ID NO: 228-234, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 0.01 nM or less, *e.g.,* about 0.001-0.002 nM. In an example, the antibody molecule does

not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 3.16 nM, or about 0.1-0.5 nM or 0.2-0.4 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 5 nM or less, *e.g.,* about 2.35 nM, or about 0.1-0.5 nM or 0.1-0.2 nM.

In another example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4035-062 (*e.g.,* SEQ ID NO: 93 or 99); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4035-062 (*e.g.,* SEQ ID NO: 94 or 273); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4035-062 (*e.g.,* SEQ ID NO: 95), and

(ii) a light chain variable region (VH), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4035-062 (*e.g.,* SEQ ID NO: 96); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4035-062 (*e.g.,* SEQ ID NO: 97); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4035-062 (*e.g.,* SEQ ID NO: 98).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4035-062 (*e.g.,* SEQ ID NO: 225); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4035-062 (*e.g.,* SEQ ID NO: 229).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 299 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 300 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 4035-062.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 0.01 nM or less, *e.g.,* about 0.001-0.002 nM. In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 1 nM or less, *e.g.,* about 0.1-0.5 nM or 0.2-0.4 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 1 nM or less, *e.g.,* about 0.1-0.5 nM or 0.1-0.2 nM.

In another example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising the amino acid sequence of I-Y-D-V-H (SEQ ID NO: 99); an HCDR2 comprising the amino acid sequence of V-I-W-S-D-G-S-T-D-Y-N-X12-X13-X14-X15-S (SEQ ID NO: 342), X12 is A or P, X13 is A or S, X14 is F or L, and X15 is I or K; or an HCDR3 comprising the amino acid sequence of N-W-V-D-Q-A-W-F-A-Y (SEQ ID NO: 95), and

(ii) a light chain variable region (VH), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising the amino acid sequence of R-A-S-K-N-I-Y-S-Y-L-A (SEQ ID NO: 96); an LCDR2 comprising the amino acid sequence of N-A-K-T-L-P-E (SEQ ID NO: 97); or an LCDR3 comprising the amino acid sequence of Q-H-H-Y-G-T-P-L-T (SEQ ID NO: 98).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of SEQ ID NO: 101 or 225; or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of SEQ ID NO: 102 or 229.

In an example, the antibody molecule is monoclonal antibody 4035. In an example, the antibody molecule is monoclonal antibody 4035-062.

In another example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 103 or 109); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 104 or 110); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 105), and

(ii) a light chain variable region (VH), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 106); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 107); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 108).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 111); or (ii) a VL

comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3934 (*e.g.,* SEQ ID NO: 112).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 175 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 176 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 3934. In an example, the antibody molecule is humanized monoclonal antibody 3934.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 3.16 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6

nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 5 nM or less, *e.g.,* about 2.35 nM.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 11 or 149); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 142 or 150); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 143), and

(ii) a light chain variable region (VH), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 144 or 146); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 107 or 147); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 145 or 148).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 151); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4338 (*e.g.,* SEQ ID NO: 152 or 153).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 183 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 184 or 185 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 4338. In an example, the antibody molecule is humanized monoclonal antibody 4338.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 3.16 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM

and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 5 nM or less, *e.g.,* about 2.35 nM.

In another example, the antibody molecule comprises (i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 163 or 169); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 164 or 170); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 165), and

(ii) a light chain variable region (VH), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 166); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 167); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 168).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 171); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4237 (*e.g.,* SEQ ID NO: 172).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 188 (or a nucleotide sequence substantially identical thereto) or a VL

encoded by the nucleotide sequence of SEQ ID NO: 189 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 4237. In an example, monoclonal antibody 4237 is humanized monoclonal antibody 4237. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NO: 235-240, a VL comprising the amino acid sequence of any of SEQ ID NO: 241-245, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 3.16 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM

and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 5 nM or less, *e.g.,* about 2.35 nM.

In another example, the antibody molecule comprises one or both of:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence of G-Y-X3-X4-T-X6-X7-Y (SEQ ID NO: 330), wherein X3 is S or T; X4 is I or F; X6 is S or absent; and X7 is G, D or S; an HCDR2 comprising an amino acid sequence of X3-X4-X5-X6-X7-X8 (SEQ ID NO: 331), wherein X3 is absent, N or Y; X4 is S or P, X5 is Y, L or R; X6 is D, N or R; X7 is G or S; and X8 is Y, D or S; or an HCCDR3 comprising an amino acid sequence of X1-X2-X3-X4-Y-X6-X7-X8-X9-F-X11-X12 (SEQ ID NO: 332), wherein X1 is Y, E or H; X2 is absent or G; X3 is Y, D or A; X4 is D, G or Y; X6 is E, absent or D; X7 is D, Y, S or K; X8 is W, N or R; X9 is Y, A or G; X11 is G or D; and X12 is V or Y, or

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence of X1-A-S-X4-S-V-X7-X8-X9-G-X11-X12-X13-X14-X15 (SEQ ID NO: 333), wherein X1 is R or K; X4 is E or Q; X7 is D or S; X8 is N, F, I or N; X9 is Y, A, I or D; X11 is I or T; X12 is S, N or R; X13 is F, L or S; X14 is M or I; and X15 is N or H; an LCDR2 comprising an amino acid sequence of X1-A-S-N-X5-X6-X7 (SEQ ID NO: 334), wherein X1 is A, R or H; X5 is Q or L; X6 is G or E; and X7 is S, P or T; or an LCDR3 comprising an amino acid sequence of X1-Q-S-X4-X5-X6-P-X8-T (SEQ ID NO: 335), wherein X1 is Q or L; X4 is K, R or N; X5 is E or K; X6 is V, Y, I or D; and X8 is R, W or Y.

In an example, the antibody molecule is any of monoclonal antibodies 2218, 2419, 2922, or 3327.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule does not bind, or binds to

mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, or 0.1 nM or less, *e.g.,* between 0.1 and 50 nM, *e.g.,* between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In another example, the antibody molecule comprises one or both of:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence of X6-X7-Y-X9-X10-X11 (SEQ ID NO: 336), wherein X6 is S or absent; X7 is G, D or S; X9 is Y, F, T or D; X10 is W, M, I or V; and X11 is N, H or F; an HCDR2 comprising an amino acid sequence of X1-I-X3-X4-X5-X6-X7-X8-X9-X10-Y-N-X13-X14-X15-K-X17 (SEQ ID NO: 337), wherein X1 is Y, R or W; X3 is absent, N or Y; X4 is S or P, X5 is Y, L or R; X6 is D, N or R; X7 is G or S; X8 is Y, D or S; X9 is N, T or I; X10 is N, F or K; X13 is P, Q or E; X14 is S or K; X15 is L or F; and X17 is N, G or D; or an HCCDR3 comprising an amino acid sequence of X1-X2-X3-X4-Y-X6-X7-X8-X9-F-X11-X12 (SEQ ID NO: 332), wherein X1 is Y, E or H; X2 is absent or G; X3 is Y, D or A; X4 is D, G or Y; X6 is E, absent or D; X7 is D, Y, S or K; X8 is W, N or R; X9 is Y, A or G; X11 is G or D; and X12 is V or Y, or

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino

acid sequence of X1-A-S-X4-S-V-X7-X8-X9-G-X11-X12-X13-X14-X15 (SEQ ID NO: 333), wherein X1 is R or K; X4 is E or Q; X7 is D or S; X8 is N, F, I or N; X9 is Y, A, I or D; X11 is I or T; X12 is S, N or R; X13 is F, L or S; X14 is M or I; and X15 is N or H; an LCDR2 comprising an amino acid sequence of X1-A-S-N-X5-X6-X7 (SEQ ID NO: 334), wherein X1 is A, R or H; X5 is Q or L; X6 is G or E; and X7 is S, P or T; or an LCDR3 comprising an amino acid sequence of X1-Q-S-X4-X5-X6-P-X8-T (SEQ ID NO: 335), wherein X1 is Q or L; X4 is K, R or N; X5 is E or K; X6 is V, Y, I or D; and X8 is R, W or Y.

In an example, the antibody molecule is any of monoclonal antibodies 2218, 2419, 2922, or 3327. In an example, the antibody molecule is a humanized monoclonal antibody 2218, 2419, 2922, or 3327.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human TACI, at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of human APRIL to human BCMA, at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM

or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In another example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 61 or 64); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 62 or 65); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 63), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 67); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 66); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3530 (*e.g.,* SEQ ID NO: 70).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 83 (or a nucleotide sequence substantially identical thereto) or a VL

encoded by the nucleotide sequence of SEQ ID NO: 84 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 3530. In an example, the antibody molecule is a humanized monoclonal antibody 3530.

In an example, the antibody molecule binds, or substantially binds, to human APRIL, mouse APRIL, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 5 nM or less, *e.g.,* about 2.7 nM.

In an example, the antibody molecule binds, or substantially binds, to mouse APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, 10 nM or less, 9 nM or less 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM or between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,*

as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 4.95 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 1 nM or less, *e.g.,* about 0.68 nM.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 61 or 64); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 62 or 65); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 63), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 66); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3525 (*e.g.,* SEQ ID NO: 50).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 83 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 80 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 3525. In an example, the antibody molecule is a humanized monoclonal antibody 3525.

In an example, the antibody molecule binds, or substantially binds, to human APRIL, mouse APRIL, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 5 nM or less, *e.g.,* about 2.5 nM.

In an example, the antibody molecule binds, or substantially binds, to mouse APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, 10 nM or less, 9 nM or less 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM or between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an

example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 4.05 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 1 nM or less, *e.g.,* about 0.85 nM.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 113 or 119); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 114 or 120); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 115), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino

acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 117); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 118).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 121); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3833 (*e.g.,* SEQ ID NO: 122).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 177 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 178 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 3833. In an example, monoclonal antibody 3833 is a humanized monoclonal antibody 3833. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NO: 246-250, a VL comprising the amino acid sequence of any of SEQ ID NO: 251-253, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL, mouse APRIL, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 5 nM or less, *e.g.,* about 2.5 nM.

In an example, the antibody molecule binds, or substantially binds, to mouse APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, 10 nM or

less, 9 nM or less 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM or between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 4.05 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 1 nM or less, *e.g.,* about 0.85 nM.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least

85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 123 or 129); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 124 or 130); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 125), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 126); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 128).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 131); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3631 (*e.g.,* SEQ ID NO: 132).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 179 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 180 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 3631. In an example, the antibody molecule is a humanized monoclonal antibody 3631.

In an example, the antibody molecule binds, or substantially binds, to human APRIL, mouse APRIL, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005

nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 5 nM or less, *e.g.,* about 2.5 nM.

In an example, the antibody molecule binds, or substantially binds, to mouse APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, 10 nM or less, 9 nM or less 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM or between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both. In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 4.05 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an

example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 1 nM or less, *e.g.,* about 0.85 nM.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 133 or 138); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 134 or 139); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 135), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 136); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 127); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 137).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 140); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3732 (*e.g.,* SEQ ID NO: 141).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 181 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 182 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 3732. In an example, the antibody molecule is a humanized monoclonal antibody 3732.

In an example, the antibody molecule binds, or substantially binds, to human APRIL, mouse APRIL, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 5 nM or less, *e.g.,* about 2.5 nM.

In an example, the antibody molecule binds, or substantially binds, to mouse APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, 10 nM or less, 9 nM or less 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 100 nM, *e.g.,* between 0.001 nM and 50 nM, between 0.01 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM or between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 4.05 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 1 nM or less, *e.g.,* about 0.85 nM.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 154 or 159); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 155 or 160); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 156), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 116); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 157); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15

amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 161); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4540 (*e.g.,* SEQ ID NO: 162).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 186 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 187 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 4540. In an example, monoclonal antibody 4540 is a humanized monoclonal antibody 4540. In an example, the antibody molecule comprises a VH comprising the amino acid sequence of any of SEQ ID NO: 254-258, a VL comprising the amino acid sequence of any of SEQ ID NO: 259-261, or both.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540-063 (*e.g.,* SEQ ID NO: 154 or 276); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540-063 (*e.g.,* SEQ ID NO: 155 or 277); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540-063 (*e.g.,* SEQ ID NO: 156), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540-063 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540-063 (*e.g.,* SEQ ID NO: 275); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540-063 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4540-063 (*e.g.,* SEQ ID NO: 258); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4540-063 (*e.g.,* SEQ ID NO: 261).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 301 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 302 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 4540-063.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4540-033 (*e.g.,* SEQ ID NO: 154 or 159); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4540-033 (*e.g.,* SEQ ID NO: 155 or 278); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4540-033 (*e.g.,* SEQ ID NO: 156), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4540-033 (*e.g.,* SEQ ID NO: 274); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4540-033 (*e.g.,* SEQ ID NO: 275); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4540-033 (*e.g.,* SEQ ID NO: 158).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15

amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4540-033 (*e.g.,* SEQ ID NO: 256); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4540-033 (*e.g.,* SEQ ID NO: 261).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 303 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 302 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 4540-033.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the VH comprises one, two, or all of the following: an HCDR1 comprising the amino acid sequence of D-Y-Y-X4-N (SEQ ID NO: 343), where X4 is I or M; an HCDR2 comprising the amino acid sequence of W-I-F-P-G-S-G-S-T-Y-Y-X12-X13-K-X15-X16-G, where X12 is N or A, X13 is E or Q, X15 is F or L, and X16 is K or Q (SEQ ID NO: 344); or an HCDR3 comprising the amino acid sequence of G-D-S-G-R-A-M-D-Y (SEQ ID NO: 156), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the VL comprises one, two, or all of the following: an LCDR1 comprising the amino acid sequence of X1-A-S-Q-D-I-N-K-Y-I-A, wherein X1 is K or Q (SEQ ID NO: 345); an LCDR2 comprising the amino acid sequence of Y-T-S-T-L-X6-X7, wherein X_6 is Q or E, and X7 is S or T (SEQ ID NO: 346); or an LCDR3 comprising the amino acid sequence of L-Q-Y-D-N-L-L-T (SEQ ID NO: 158).

In another example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the VH comprises one, two, or all of the following: an HCDR1 comprising the amino acid sequence of G-Y-T-F-A-D-Y (SEQ ID NO: 154); an HCDR2 comprising the amino acid sequence of F-P-G-S-G-S (SEQ ID NO: 155); or an HCDR3 comprising the amino acid sequence of G-D-S-G-R-A-M-D-Y (SEQ ID NO: 156), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the VL comprises one, two, or all of the following: an LCDR1 comprising the amino acid sequence of X1-A-S-Q-D-I-N-K-Y-I-A, wherein X1 is K or Q (SEQ ID NO: 345); an LCDR2 comprising the amino acid

sequence of Y-T-S-T-L-X6-X7 (SEQ ID NO: 346), wherein X6 is Q or E, and X7 is S or T; or an LCDR3 comprising the amino acid sequence of L-Q-Y-D-N-L-L-T (SEQ ID NO: 158).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of SEQ ID NOS: 161, 256 or 258; or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of SEQ ID NO: 162 or 261.

In an example, the antibody molecule is monoclonal antibody 4540. In another example, the antibody molecule is monoclonal antibody 4540-063. In yet another example, the antibody molecule is monoclonal antibody 4540-033.

In an example, the antibody molecule binds, or substantially binds, to human APRIL, mouse APRIL, or both.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, or 0.1 nM or less, *e.g.,* between 0.1 nM and 20 nM, *e.g.,* between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 5 nM or less, *e.g.,* about 2.5 nM.

In an example, the antibody molecule binds, or substantially binds, to mouse APRIL at an EC_{50} of 100 nM or less, *e.g.,* 80 nM or less, 60 nM or less, 40 nM or less, 20 nM or less, 10 nM or less, 9 nM or less or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, or 0.1 nM or less, *e.g.,* between 0.1 nM and 20 nM, *e.g.,* between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), BCMA (*e.g.,* human BCMA), or both.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to TACI (*e.g.,* human TACI, mouse TACI, or both), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM,

e.g., as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 5 nM or less, *e.g.,* about 4.05 nM.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL, mouse APRIL, or both) to BCMA (*e.g.,* human BCMA, mouse BCMA, or both), at an IC_{50} of 200 nM or less, 150 nM or less, 100 nM or less, 50 nM or less, 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human BCMA at an IC_{50} of 1 nM or less, *e.g.,* about 0.85 nM.

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 21 or 27); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 22 or 28); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 23), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 24); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 25); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 26).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 29); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 2621 (*e.g.,* SEQ ID NO: 30).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 75 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 76 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 2621. In an example, the antibody molecule is a humanized monoclonal antibody 2621.

In an example, the antibody molecule binds, or substantially binds, to human APRIL.

In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 1 nM or less, *e.g.,* about 0.7 nM. In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI). In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of about 1 nM or less.

In an example, the antibody molecule does not inhibit, or does not substantially inhibit, binding of APRIL (*e.g.,* human APRIL) to BCMA (*e.g.,* human BCMA).

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 11 or 47); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 42 or 48); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 43), and

(ii) a light chain variable region (VH), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 44); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 45); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 46).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 49); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 3125 (*e.g.,* SEQ ID NO: 50).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 79 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 80 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 3125. In an example, the antibody molecule is a humanized monoclonal antibody 3125.

In an example, the antibody molecule binds, or substantially binds, to human APRIL. In an example, the antibody molecule binds, or substantially binds, to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, 0.01 nM or less, 0.005 nM or less, 0.002 nM or less, or 0.001 nM or less, *e.g.,* between 0.001 nM and 20 nM, *e.g.,* between 0.01 nM and 20 nM, between 0.1 nM and 20 nM, between 0.1 nM and 10 nM, between 0.5 nM and 5 nM, between 1 nM and 5 nM, between 0.001 nM and 0.1 nM, between 0.001 nM and 0.01 nM, between 0.001 nM and 0.005 nM, between 0.01 nM and 0.05 nM, or between 0.01 nM and 0.1 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule binds to human APRIL at an EC_{50} of 20 nM or less, *e.g.,* about 13 nM. In an example, the antibody molecule does not bind, or binds to mouse APRIL with low affinity, *e.g.,* at an EC_{50} of 1000 nM or more, *e.g.,* 2000 nM or more, *e.g.,* as determined by a method described herein.

In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI). In an example, the antibody molecule inhibits, or substantially inhibits, binding of APRIL (*e.g.,* human APRIL) to TACI (*e.g.,* human TACI), at an IC_{50} of 50 nM or less, *e.g.,* 40 nM or less, 30 nM or less, 20 nM or less, 10 nM or less, 9 nM or less, 8 nM or less, 7 nM or less, 6 nM or less, 5 nM or less, 4 nM or less, 3 nM or less, 2 nM or less, 1 nM or less, 0.8 nM or less, 0.6 nM or less, 0.4 nM or less, 0.2 nM or less, 0.1 nM or less, 0.05 nM or less, 0.02 nM or less, or 0.01 nM or less, *e.g.,* between 0.01 nM and 50 nM, between 0.1 nM and 50 nM, between 0.1 nM and 25 nM, between 0.1 nM and 10 nM, between 0.1 nM and 5 nM, between 0.1 nM and 1 nM, between 0.1 nM and 0.5 nM, between 0.5 nM and 5 nM, or between 1 nM and 5 nM, *e.g.,* as determined by a method described herein. In an example, the antibody molecule inhibits binding of human APRIL to human TACI at an IC_{50} of 150 nM or less, *e.g.,* about 112.97 nM. In an example, the antibody molecule does not inhibit, or does not substantially inhibit, binding of APRIL (*e.g.,* human APRIL) to BCMA (*e.g.,* human BCMA).

In an example, the antibody molecule comprises:

(i) a heavy chain variable region (VH), wherein the heavy chain variable region comprises three heavy chain complementarity determining regions (HCDR1, HCDR2, and HCDR3), wherein the heavy chain variable region comprises one, two, or all of the following: an HCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR1 of monoclonal antibody 4439 (*e.g.,* SEQ ID NO: 266 or 269); an HCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100%

homology with, the amino acid sequence of the HCDR2 of monoclonal antibody 4439 (*e.g.,* SEQ ID NO: 267 or 270); or an HCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the HCDR3 of monoclonal antibody 4439 (*e.g.,* SEQ ID NO: 268), and

(ii) a light chain variable region (VL), wherein the light chain variable region comprises three light chain complementarity determining regions (LCDR1, LCDR2, and LCDR3), wherein the light chain variable region comprises one, two, or all of the following: an LCDR1 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR1 of monoclonal antibody 4439 (*e.g.,* SEQ ID NO: 146); an LCDR2 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR2 of monoclonal antibody 4439 (*e.g.,* SEQ ID NO: 147); or an LCDR3 comprising an amino acid sequence that differs by no more than 1, 2, or 3 amino acid residues from, or has at least 85, 90, 95, 99 or 100% homology with, the amino acid sequence of the LCDR3 of monoclonal antibody 4439 (*e.g.,* SEQ ID NO: 148).

In an example, the antibody molecule comprises one or both of: (i) a VH comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VH of monoclonal antibody 4439 (*e.g.,* SEQ ID NO: 271); or (ii) a VL comprising an amino acid sequence that differs by no more than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 amino acid residues from, or has at least 85, 90, 95, 96, 97, 98, 99, or 100% homology with, the amino acid sequence of the VL of monoclonal antibody 4439 (*e.g.,* SEQ ID NO: 272).

In an example, the antibody molecule comprises a VH encoded by the nucleotide sequence of SEQ ID NO: 297 (or a nucleotide sequence substantially identical thereto) or a VL encoded by the nucleotide sequence of SEQ ID NO: 298 (or a nucleotide sequence substantially identical thereto), or both.

In an example, the antibody molecule is monoclonal antibody 4439. In an example, monoclonal antibody 4439 is humanized monoclonal antibody 4439.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in any of **Tables 3-4 or 7-8**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in **Table 3**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from

Table 3. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 3**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises APRIL residues from two monomers, *e.g.,* one or more residues from monomer A and monomer B as shown in **Table 3**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or more, residues within a region of human APRIL as defined in **Table 4**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, or all, of the human APRIL residues from **Table 4**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 4**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises one or more APRIL residues from the C-D loop (*e.g.,* the loop connecting β-sheets C and D), the G-H loop (*e.g.,* the loop connecting β-sheets G and H), or both.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, residues within a region of human APRIL as defined in **Table 7**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or all, of the human APRIL residues from **Table 7**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 7**.

In an example, the antibody molecule binds, or substantially binds, to one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or more, residues within a region of human APRIL as defined in **Table 8**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises or consists of one or more, *e.g.,* 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, or all, of the human APRIL residues from **Table 8**. In an example, the antibody molecule binds, or substantially binds, to an epitope that overlaps an epitope that comprises or consists of all of the human APRIL residues from **Table 8**. In an example, the antibody molecule binds, or substantially binds, to an epitope that comprises APRIL residues from two monomers, *e.g.,* one or more residues from monomer A and monomer B as shown in **Table 8**.

In an example, the antibody molecule is an IgG antibody molecule, *e.g.,* comprising a heavy chain constant region of IgG, *e.g.,* chosen from IgG1, IgG2 (*e.g.,* IgG2a), IgG3, or IgG4, *e.g.,* IgG2 or IgG4. In an example, the antibody molecule is an IgG1 antibody molecule. In another example, the antibody molecule is an IgG2 antibody molecule. In an example, the antibody molecule comprises a light chain constant region of kappa or lambda light chain.

In an example, the antibody molecule comprises an Fc region. In an example, the Fc region comprises one or more mutations located at the interface between the CH2 and CH3 domains (*e.g.,* to increase the binding affinity to neonatal receptor FcRn and/or the half-life of the antibody molecule). In an example, the Fc region comprises one or more mutations, *e.g.,* one or more (*e.g.,* 2, 3, 4, 6 or all) mutations chosen from T250Q, M252Y, S254T, T256E, M428L, H433K, N434F, or any combination thereof, of IgG1. In an example, the Fc region comprises one or more mutations at positions 233-236 or 322 of human IgG1 or IgG2, or one or more substitutions at positions 327, 330 or 331 of human IgG4 (*e.g.,* to reduce complement-dependent cytotoxicity (CDC)). In an example, the Fc region comprises one or more (*e.g.,* 2, 3, 4, 6 7 or all) mutations chosen from E233P, L234V, L235A, G236, K322A, A327G, A330S, P331S, or any combination thereof.

In an example, the antibody molecule is a humanized antibody molecule, *e.g.,* as described in **Table 5**, *e.g.,* comprising one or more framework regions derived from human framework germline sequence.

In an example, the antibody molecule comprises two heavy chain variable regions and two light chain variable regions. In an example, the antibody molecule is a Fab, F(ab')2, Fv, Fd, or a single chain Fv fragment (scFv).

In one aspect, the disclosure features an anti-A PRoliferation Inducing Ligand (APRIL) antibody comprising a heavy chain variable domain comprising a heavy chain complementarity determining region (VH CDR) 1, a VH CDR2, and a VH CDR3 and a light chain variable domain comprising a light chain complementarity determining region (VL CDR)1, a VL CDR2, and a VL CDR3, wherein:

a) the VH CDR1 comprises the amino acid sequence set forth in SEQ ID NO: 11;

b) the VH CDR2 comprises the amino acid sequence set forth in SEQ ID NO: 12;

c) the VH CDR3 comprises the amino acid sequence set forth in SEQ ID NO: 13;

d) the VL CDR1 comprises the amino acid sequence set forth in SEQ ID NO: 280;

e) the VL CDR2 comprises the amino acid sequence set forth in SEQ ID NO: 285; and

f) the VL CDR3 comprises the amino acid sequence set forth in SEQ ID NO: 16, by the Chothia numbering system.

In another aspect, the disclosure features an anti-A PRoliferation Inducing Ligand (APRIL) comprising a VH comprising the amino acid sequence of SEQ ID NO: 296 and a VL comprising the amino acid sequence of SEQ ID NO: 286, wherein the antibody molecule further comprises a heavy chain constant region of IgG2 that is linked to the VH and a light chain constant region of kappa chain that is linked to the VL.

The disclosure features a composition, *e.g.,* pharmaceutical composition, comprising an antibody molecule described herein. In an example, the composition further comprises a pharmaceutical acceptable carrier.

In another aspect, the disclosure features a composition comprising the anti-APRIL antibody as described herein and a pharmaceutically acceptable carrier.

The disclosure features a nucleic acid molecule encoding a heavy chain variable region (VH), a light chain variable region (VL), or both, of an antibody molecule described herein.

In another aspect, the disclosure features a nucleic acid encoding the anti-APRIL antibody as described herein.

The disclosure features a vector comprising a nucleic acid molecule described herein.

In another aspect, the disclosure features a vector comprising the nucleic acid as described herein.

The disclosure features a cell, *e.g.,* an isolated cell, comprising a nucleic acid molecule described herein or a vector described herein.

In another aspect, the disclosure features a isolated cell comprising the vector as described herein.

The disclosure features a kit comprising an antibody molecule described herein and instructions to use of the antibody molecule.

The disclosure features a container comprising an antibody molecule described herein.

The disclosure features a method of producing an anti-APRIL antibody molecule, the method comprising culturing a cell described herein under conditions that allow production of an antibody molecule, thereby producing the antibody molecule.

In another aspect, the disclosure features a method of producing an anti-APRIL antibody, the method comprising culturing the isolated cell as described herein, thereby producing the anti-APRIL antibody.

In an example, the method further comprises isolating the antibody molecule.

The disclosure features a method of treating IgA nephropathy, the method comprising administering to a subject in need thereof an effective amount of an antibody molecule described herein or a composition described herein, thereby treating IgA nephropathy.

In an example, the antibody molecule is administered to the subject intravenously.

In an example, the antibody molecule is administered to the subject at a dose between 0.1 mg/kg and 50 mg/kg, *e.g.,* between 0.2 mg/kg and 25 mg/kg, between 0.5 mg/kg and 10 mg/kg, between 0.5 mg/kg and 5 mg/kg, between 0.5 mg/kg and 3 mg/kg, between 0.5 mg/kg and 2.5 mg/kg, between 0.5 mg/kg and 2 mg/kg, between 0.5 mg/kg and 1.5 mg/kg, between 0.5 mg/kg and 1 mg/kg, between 1 mg/kg and 1.5 mg/kg, between 1 mg/kg and 2 mg/kg, between 1 mg/kg and 2.5 mg/kg, between 1 mg/kg and 3 mg/kg, between 1 mg/kg and 2.5 mg/kg, or between 1 mg/kg and 5 mg/kg.

In an example, the antibody molecule is administered to the subject at a fixed dose between 10 mg and 1000 mg, *e.g.,* between 10 mg and 500 mg, between 10 mg and 250 mg, between 10 mg and 150 mg, between 10 mg and 100 mg, between 10 mg and 50 mg, between 250 mg and 500 mg, between 150 mg and 500 mg, between 100 mg and 500 mg, between 50 mg and 500 mg, between 25 mg and 250 mg, between 50 mg and 150 mg, between 50 mg and 100 mg, between 100 mg and 150 mg. between 100 mg and 200 mg, or between 150 mg and 250 mg.

In an example, the antibody molecule is administered once a week, twice a week, once every two weeks, once every three weeks, once every four weeks, once every eight weeks, once a month, once every two months, or once every three months.

In an example, administration of the antibody molecule reduces the level of IgA in a peripheral tissue, *e.g.,* in serum, mucosal tissue, bone marrow, or any combination thereof.

In an example, administration of the antibody molecule reduces the level of IgA1. In an example, administration of the antibody molecule reduces the level of IgA1 in polymeric form (pIgA1). In an example, administration of the antibody molecule reduces the level of IgA1 with O-linked glycosylation variants (*e.g.,* aberrant or reduced composition of galactose in CH1 hinge region).

In an example, the method further comprises determining the level of IgA in a peripheral tissue sample from the subject, *e.g.,* chosen from serum, mucosal tissue, or bone marrow.

In an example, the method further comprises administering to the subject a second therapy for IgA nephropathy. In an example, the second therapy is chosen from an angiotensin-converting enzyme (ACE) inhibitor, an angiotensin receptor blocker (ARB), omega-3 fatty acids, an immunosuppressant (*e.g.,* a corticosteroid, *e.g.,* prednisone), a statin, mycophenolate mofetil, or any combination thereof.

The disclosure features a method of treating diabetic nephropathy, the method comprising administering to a subject in need thereof an effective amount of an antibody molecule described herein or a composition described herein, thereby treating diabetic nephropathy.

The disclosure features a method of treating cancer, the method comprising administering to a subject in need thereof an effective amount of an antibody molecule described herein or a composition described herein, thereby treating cancer.

In an example, the cancer is a hematological cancer. In an example, the hematological cancer is chosen from B-cell non-Hodgkin's lymphoma, chronic lymphocytic leukemia (CLL), Hodgkin's lymphoma, multiple myeloma, Waldenström macroglobulinemia, or lymphoplasmacytic lymphoma. In an example, the cancer is a multiple myeloma.

The disclosure features a method of treating an immunoproliferative disorder, the method comprising administering to a subject in need thereof an effective amount of an antibody molecule described herein or a composition described herein, thereby treating the immunoproliferative disorder.

In an example, the immunoproliferative disorder is monoclonal IgA hypergammaglobulinemia.

The disclosure features a method of treating vasculitis, the method comprising administering to a subject in need thereof an effective amount of an antibody molecule described herein or a composition described herein, thereby treating vasculitis.

In an example, the vasculitis is kidney vasculitis. In an example, the vasculitis is an IgA associated vasculitis (*e.g.,* Henoch-Schonlein purpura) or post-streptococcal glomerulonephritis.

The disclosure features a method of treating an autoimmune disorder, the method comprising administering to a subject in need thereof an effective amount of an antibody molecule described herein or a composition described herein, thereby treating the autoimmune disorder.

In an example, the autoimmune disorder is chosen from rheumatoid arthritis, systemic lupus erythematosus, a linear IgA bullous disease (*e.g.,* linear immunoglobulin A (IgA) dermatosis), or IgA-mediated epidermolysis bullosa acquisita (EBA).

The disclosure features a method of treating IgA pemphigus, the method comprising administering to a subject in need thereof an effective amount of an antibody molecule described herein or a composition described herein, thereby treating IgA pemphigus.

The disclosure features a method of treating celiac disease, the method comprising administering to a subject in need thereof an effective amount of an antibody molecule described herein or a composition described herein, thereby treating celiac disease.

The disclosure features a method of treating alcoholic cirrhosis, the method comprising administering to a subject in need thereof an effective amount of an antibody molecule described herein or a composition described herein, thereby treating alcoholic cirrhosis.

The disclosure features a method of reducing the level of IgA in a cell or subject, the method comprising contacting the cell or subject, or administering to a subject in need thereof an

effective amount of, an antibody molecule described herein or a composition described herein, thereby reducing the level of IgA.

In an example, the antibody molecule is administered to the subject intravenously.

In an example, the antibody molecule is administered to the subject at a dose between 0.1 mg/kg and 50 mg/kg, *e.g.,* between 0.2 mg/kg and 25 mg/kg, between 0.5 mg/kg and 10 mg/kg, between 0.5 mg/kg and 5 mg/kg, between 0.5 mg/kg and 3 mg/kg, between 0.5 mg/kg and 2.5 mg/kg, between 0.5 mg/kg and 2 mg/kg, between 0.5 mg/kg and 1.5 mg/kg, between 0.5 mg/kg and 1 mg/kg, between 1 mg/kg and 1.5 mg/kg, between 1 mg/kg and 2 mg/kg, between 1 mg/kg and 2.5 mg/kg, between 1 mg/kg and 3 mg/kg, between 1 mg/kg and 2.5 mg/kg, or between 1 mg/kg and 5 mg/kg.

In an example, the antibody molecule is administered to the subject at a fixed dose between 10 mg and 1000 mg, *e.g.,* between 10 mg and 500 mg, between 10 mg and 250 mg, between 10 mg and 150 mg, between 10 mg and 100 mg, between 10 mg and 50 mg, between 250 mg and 500 mg, between 150 mg and 500 mg, between 100 mg and 500 mg, between 50 mg and 500 mg, between 25 mg and 250 mg, between 50 mg and 150 mg, between 50 mg and 100 mg, between 100 mg and 150 mg. between 100 mg and 200 mg, or between 150 mg and 250 mg.

In an example, the antibody molecule is administered once a week, twice a week, once every two weeks, once every three weeks, once every four weeks, once every eight weeks, once a month, once every two months, once every three months.

In an example, administration of the antibody molecule reduces the level of IgA in a peripheral tissue, *e.g.,* in serum, mucosal tissue, bone marrow, or any combination thereof.

In an example, administration of the antibody molecule reduces the level of IgA1. In an example, administration of the antibody molecule reduces the level of IgA1 in polymeric form (pIgA1). In an example, administration of the antibody molecule reduces the level of IgA1 with O-linked glycosylation variants (*e.g.,* aberrant or reduced composition of galactose in CH1 hinge region).

The disclosure features use of an antibody molecule described herein or a composition described herein in the treatment, or in the manufacture of a medicament for the treatment, of a disorder described herein.

In another aspect, the disclosure features use of the anti-APRIL antibody as described herein or the composition as described herein in the manufacture of a medicament for treating a disease or condition in a subject.

The disclosure features an antibody molecule described herein or a composition described herein for use in the treatment of a disorder described herein.

The disclosure features a method of detecting an APRIL molecule, the method comprising contacting a cell or a sample from a subject with an antibody molecule described herein, thereby detecting the APRIL molecule.

In an example, the antibody molecule is coupled with a detectable label. In an example, the APRIL molecule is detected *in vitro* or *ex vivo*. In another example, the APRIL molecule is detected *in vivo*.

In another aspect, the disclosure features a method of detecting an APRIL molecule, the method comprising contacting a cell or a sample from a subject with an antibody molecule as described herein, thereby detecting the APRIL molecule, wherein the APRIL molecule is detected *in vitro* or *ex vivo*.

The disclosure contemplates all combinations of any one or more of the foregoing aspects and/or examples, as well as combinations with any one or more of the examples set forth in the detailed description and examples.

Other features, objects, and advantages of the compositions and methods herein will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1A-1B depict the anti-APRIL antibody profiling from mouse-derived hybridomas. CD-1 mice were immunized with recombinant multimeric APRIL (human or mouse) as described. The splenocytes from anti-APRIL seropositive mice were immortalized through myeloma fusion to generate hybridomas. ELISA-based screening methods were used for evaluating anti-APRIL antibodies present in conditioned media of immunoglobulin producing hybridomas. Cell culture supernatants were initially screened both for binding to target (APRIL) by indirect ELISA and for functional activity with respect to ability to block interaction of APRIL with the recombinant, soluble human TNF receptor TACI-Fc (blocking ELISA). Screening against both human and mouse APRIL was carried out to identify potentially cross-reactive antibodies. Relative activities are based on single point measurements following normalization of immunoglobulin concentration to 10 µg/mL when possible. APRIL immunogen for final tail vein boost is noted in bold. Hybridoma-derived antibodies lacking blocking activity to either human or mouse APRIL (as initially defined by less than 10% receptor blocking in this first-pass screening assay) are not included in this summary table. Ig isotypes for select hybridomas are noted.

FIGS. 2A-2B depict the APRIL receptor blocking activity of exemplary anti-APRIL antibodies. Functional activities of select anti-APRIL antibodies purified from mouse-derived hybridoma clones were assessed by ELISA using recombinant TACI-Fc as soluble receptor. Assay involves two steps: 1) preincubation of APRIL with varying concentrations of purified mouse antibody; 2) subsequent measurement of APRIL binding to immobilized TACI-Fc as quantified by ELISA using the appropriate secondary antibody for detection of epitope tagged APRIL. Interference of APRIL-receptor binding was measured as a loss of A_{450}. Hybridoma antibodies are depicted by solid symbols. Control and comparator antibodies are depicted by open symbols. Apry-1-1 represents a mouse-specific blocking antibody used as a control. Human neutralizing antibodies 0201 and 1313 were likewise used as controls and for comparative purposes to antibodies described in the scientific literature. Data presented is representative of assay and method for assessing antibody inhibition

What is claimed is:

1. An anti-A PRoliferation Inducing Ligand (APRIL) antibody comprising a heavy chain variable domain comprising a heavy chain complementarity determining region (VH CDR) 1, a VH CDR2, and a VH CDR3 and a light chain variable domain comprising a light chain complementarity determining region (VL CDR)1, a VL CDR2, and a VL CDR3, wherein:

a) the VH CDR1 comprises the amino acid sequence set forth in SEQ ID NO: 11;

b) the VH CDR2 comprises the amino acid sequence set forth in SEQ ID NO: 12;

c) the VH CDR3 comprises the amino acid sequence set forth in SEQ ID NO: 13;

d) the VL CDR1 comprises the amino acid sequence set forth in SEQ ID NO: 280;

e) the VL CDR2 comprises the amino acid sequence set forth in SEQ ID NO: 285; and

f) the VL CDR3 comprises the amino acid sequence set forth in SEQ ID NO: 16, by the Chothia numbering system.

2. The anti-APRIL antibody of claim 1, further comprising a constant region linked to the heavy chain variable region (VH) and / or light chain variable region (VL).

3. The anti-APRIL antibody of claim 1 or 2, wherein the anti-APRIL antibody comprises:

(a) a heavy chain constant region of IgG1, IgG2, IgG3, or IgG4;

(b) a light chain constant region of kappa or lambda light chain; or

(c) both (a) and (b).

4. The anti-APRIL antibody of any of claims 1–3, wherein the anti-APRIL antibody comprises a fragment crystallizable (Fc) region, wherein the Fc region comprises one or more mutations located at the interface between the constant heavy chain (CH) 2 and CH3 domains.

5. A nucleic acid encoding the anti-APRIL antibody of any of claims 1–4.

6. A vector comprising the nucleic acid of claim 5.

7. An isolated cell comprising the vector of claim 6.

8. A method of producing an anti-APRIL antibody, the method comprising culturing the isolated cell of claim 7, thereby producing the anti-APRIL antibody.

9. The method of claim 8, further comprising isolating or purifying the anti-APRIL antibody.

10. A composition comprising the anti-APRIL antibody of any of claims 1–4 and a pharmaceutically acceptable carrier.

11. Use of the anti-APRIL antibody of any of claims 1–4 or the composition of claim 10 in the manufacture of a medicament for treating a disease or condition in a subject.

12. The use of claim 11, wherein the disease or condition comprises IgA nephropathy.

13. A method of detecting an APRIL molecule, the method comprising contacting a cell or a sample from a subject with an antibody molecule of any of claims 1–4, thereby detecting the APRIL molecule, wherein the APRIL molecule is detected *in vitro* or *ex vivo.*

14. The method of claim 13, wherein the antibody molecule is coupled with a detectable label.

15. An anti-A PRoliferation Inducing Ligand (APRIL) comprising a VH comprising the amino acid sequence of SEQ ID NO: 296 and a VL comprising the amino acid sequence of SEQ ID NO: 286, wherein the antibody molecule further comprises a heavy chain constant region of IgG2 that is linked to the VH and a light chain constant region of kappa chain that is linked to the VL.