rhinosinusitis and nasal polyposis (Plager, Kahl et al. 2010) and eosinophilic bronchitis (Oshikawa, Kuroiwa et al. 2001).

[0006] Additional evidence linking the IL-33/ST2 pathway to human disease is provided by genetic studies, which have identified IL-33 and/or ST2 gene polymorphisms in the general population that are significantly associated with increased risk of disease or parameters of disease severity. Several large genome-wide association studies have linked genetic variation in ST2 (IL1RL1) or IL-33 with increased risk of asthma (Gudbjartsson, Bjornsdottir et al. 2009; Moffatt, Gut et al. 2010; Wu, Romieu et al. 2010) and other studies have genetically linked this pathway to increased asthma severity (Ali, Zhang et al. 2009) and bronchial hyper responsiveness (Reijmerink, Postma et al. 2008). Similar findings have genetically implicated this pathway in allergic disorders such as atopic dermatitis (Shimizu, Matsuda et al. 2005), rhinosinusitis (Sakashita, Yoshimoto et al. 2008; Castano R 2009) as well as nasal polyposis (Buysschaert, Grulois et al. 2010).

[0007] Collectively, these links to several human diseases and the ability of this cytokine axis to promote many forms of harmful inflammation imply this is a useful target for therapeutic intervention.

SUMMARY ~~OF THE INVENTION~~

[0008] The ~~invention~~present disclosure provides anti-ST2 antigen binding proteins, e.g., antibodies and functional fragments thereof, having properties amenable to commercial production and therapeutic use in humans. The anti-ST2 antigen binding proteins are particularly useful in methods of treating diseases and disorders associated with the IL-33/ST2 axis. Provided herein are ST2-binding antibodies that bind ST2 with high affinity and effectively block IL-33-binding, thereby reducing IL-33-mediated signaling in the cell.

[0009] In one aspect, there is provided an isolated ST2 antibody comprising: a) a light chain variable domain having at least 90% identity to the amino acid sequence set forth in SEQ ID NO:96; b) a heavy chain variable domain having at least 90% identity to the amino acid sequence set forth in SEQ ID NO:30; or c) a light chain variable domain of a) and a heavy chain variable domain of b). In a first ~~aspect~~example, the ST2 antigen binding protein comprises a) a light chain variable domain having at least 90% identity, at least 95% identity, or is identical to the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165; b) a heavy chain variable domain having at least 90% identity, at least 95% identity, or is identical to the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:145, SEQ ID NO:146, or SEQ ID NO:147; or c) the light chain variable domain of a) and the heavy chain variable domain of b).

[0010] Preferred antigen binding proteins of the first ~~aspect~~example include those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:95 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:29; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:96 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:30; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:97 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:31; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:98 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:32; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:99 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:33; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:100 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:34; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:101 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:35; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:102 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:36; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:103 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:37; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:104 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:38; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:105 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino

acid sequence set forth in SEQ ID NO:39; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:163 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:145; those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:164 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:146; and those comprising a light chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:165 and a heavy chain variable domain having at least 90%, at least 95%, or is identical to the amino acid sequence set forth in SEQ ID NO:147.

[0011] In another aspect, there is provided an isolated ST2 antibody, comprising: a) a light chain variable domain having no more than ten amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:96; b) a heavy chain variable domain having no more than ten amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:30; or c) the light chain variable domain of a) and the heavy chain variable domain of b). In a second ~~aspect~~example, the ST2 antigen binding protein comprises a) a light chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165; b) a heavy chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:145, SEQ ID NO:146, or SEQ ID NO:147; or c) the light chain variable domain of a) and the heavy chain variable domain of b).

[0012] Preferred antigen binding proteins of the second ~~aspect~~example include those comprising a light chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:95 and a heavy chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:29; those comprising a light chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:96 and a heavy chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:30; those comprising a light chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:97 and a heavy chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID

forth in SEQ ID NO:163 and a heavy chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:145; those comprising a light chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:164 and a heavy chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:146; and those comprising a light chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:165 and a heavy chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:147.

[0013] In another aspect, there is provided an isolated ST2 antibody comprising: a) a light chain variable domain comprising an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:107; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:118; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:129; and b) a heavy chain variable domain comprising an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:41; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:52; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:63. In a third ~~aspect~~example, the ST2 antigen binding protein contains a light chain variable domain comprising a) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:106; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:117; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:128; b) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:107; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:118; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:129; c) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:108; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:119; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:130; d) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:109; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:120; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:131; e) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:110; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:121; and an LCDR3 having no more than three amino

SEQ ID NO:155; or bb) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:150; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:153; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:156.

[0014] Preferred ST2 antigen binding proteins of third ~~aspect~~example include those comprising the light chain variable domain of a) and the heavy chain variable domain of o); those comprising the light chain variable domain of b) and the heavy chain variable domain of p); those comprising the light chain variable domain of c) and the heavy chain variable domain of q); those comprising the light chain variable domain of d) and the heavy chain variable domain of r); those comprising the light chain variable domain of e) and the heavy chain variable domain of s); those comprising the light chain variable domain of f) and the heavy chain variable domain of t); those comprising the light chain variable domain of g) and the heavy chain variable domain of u); those comprising the light chain variable domain of h) and the heavy chain variable domain of v); those comprising the light chain variable domain of i) and the heavy chain variable domain of w); those comprising the light chain variable domain of j) and the heavy chain variable domain of x); those comprising the light chain variable domain of k) and the heavy chain variable domain of y); those comprising the light chain variable domain of l) and the heavy chain variable domain of z); those comprising the light chain variable domain of m) and the heavy chain variable domain of aa); and those comprising the light chain variable domain of n) and the heavy chain variable domain of bb).

[0015] In a fourth ~~aspect~~example of the ~~invention~~present disclosure, the ST2 antigen binding protein of the first, second, or third ~~aspect~~example binds to human ST2 with an affinity of less than or equal to 1 x 10^{-10} M.

[0016] In a fifth ~~aspect~~example of the ~~invention~~present disclosure, the ST2 antigen binding protein of the first, second, third, or fourth ~~aspect~~example inhibits binding of human ST2 to human IL-33.

[0017] In a sixth ~~aspect~~example of the ~~invention~~present disclosure, the ST2 antigen binding protein of the first, second, third, fourth, or fifth ~~aspect~~example reduces human IL-33-mediated ST2 signaling in human ST2-expressing cells.

[0018] In a seventh ~~aspect~~example of the ~~invention~~present disclosure, the ST2 antigen binding protein of the sixth ~~aspect~~example, reduces IL-33-mediated cynomolgus monkey ST2 signaling in cynomolgous monkey ST2-expressing cells.

[0019] In an eighth ~~aspect~~example of the ~~invention~~present disclosure, the ST2 antigen binding protein of the first, second, third, fourth, fifth, sixth or seventh ~~aspect~~example is an antibody, such as a human antibody. Preferred antibodies include those antibodies that comprise a light chain having the amino acid sequence set forth in SEQ ID:84 and a heavy chain having the amino acid sequence set forth in

SEQ ID NO:18; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:85 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:19; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:86 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:20; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:87 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:21; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:88 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:22; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:89 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:23; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:90 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:24; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:91 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:25; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:92 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:26; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:93 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:27; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:94 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:28; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:160 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:142; those that comprise a light chain having the amino acid sequence set forth in SEQ ID:161 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:143; and those that comprise a light chain having the amino acid sequence set forth in SEQ ID:162 and a heavy chain having the amino acid sequence set forth in SEQ ID NO:144.

[0020] In yet another aspect, there is provided an isolated nucleic acid encoding a light chain variable domain of an antibody as described herein. In yet another aspect, there is provided an isolated nucleic acid encoding a heavy chain variable domain of an antibody as described herein. In yet another aspect, there is provided an isolated nucleic acid encoding a light chain variable domain and a heavy chain variable domain of an antibody as described herein. In a ninth ~~aspect~~example, the ~~invention~~present disclosure provides isolated nucleic acids encoding one or more polypeptide components of a ST2 antigen binding protein, e.g., an antibody light chain or antibody heavy chain. In preferred ~~embodiments~~examples the nucleic acid encodes a polypeptide comprising:

[0021] a) a light chain variable domain having at least 95% identity to the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165;

[0022] b) a heavy chain variable domain having at least 95% identity to the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ

sequence set forth in SEQ ID NO:60; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:71;

[0051] xi) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:50; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:61; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:72;

[0052] xii) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:148; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:151; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:154;

[0053] xiii) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:149; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:152; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:155; or

[0054] xiv) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:150; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:153; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:156.

[0055] In certain embodiments of the ninth aspect, the polypeptide encodes an antibody light chain and is at least 80%, at least 90%, at least 95%, or is 100% identical to the nucleotide sequence set forth in SEQ ID NO:73, SEQ ID NO:74, SEQ ID NO:75, SEQ ID NO:76, SEQ ID NO:77, SEQ ID NO:78, SEQ ID NO:79, SEQ ID NO:80, SEQ ID NO:81, SEQ ID NO:82, SEQ ID NO:83, SEQ ID NO:157, SEQ ID NO:158, or SEQ ID NO:159. In other embodiments of the ninth aspect, the polypeptide encodes an antibody heavy chain and is at least 80%, at least 90%, at least 95%, or is 100% identical to the nucleotide sequence set forth in SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:139, SEQ ID NO:140, or SEQ ID NO:141.

[0056] In another aspect, there is provided the expression vector comprising the isolated nucleic acid as described herein. In a tenth ~~aspect~~example, the ~~invention~~present disclosure provides an expression vector comprising one or more isolated nucleic acids of the eighth ~~aspect~~example. In certain ~~embodiments~~examples, the expression vector

encodes an antibody light chain, an antibody heavy chain, or both an antibody light chain and a heavy chain.

[0057] In another aspect, there is provided a recombinant host cell comprising an isolated nucleic acid as described herein operably linked to a promoter. In another aspect, there is provided a recombinant host cell comprising an expression vector as described herein. In an eleventh ~~aspect~~example, the ~~invention~~present disclosure provides a recombinant host cell comprising one or more isolated nucleic acids of the ninth ~~aspect~~example operably linked to a promoter, including recombinant host cells comprising one or more expression vectors of the tenth ~~aspect~~example of the invention. In preferred ~~embodiments~~examples, the recombinant host cell secretes an antibody that binds ST2. Preferred host cells are mammalian host cells, including CHO cell lines.

[0058] In yet another aspect, there is provided the use of a ST2 antibody as described herein in the manufacture of a medicament for treating an autoimmune or inflammatory disorder to a patient in need thereof. In a twelfth ~~aspect~~example, the ~~invention~~present disclosure provides methods of treating an autoimmune or inflammatory disorder said method comprising administering a therapeutically effective amount of a ST2 antigen binding protein of any one of the first, second, third, fourth, fifth, sixth, sixth, seventh, or eighth ~~aspects~~examples to a patient in need thereof. In preferred ~~embodiments~~examples, the ST2 antigen binding protein is an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:95 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:29 (e.g., Ab1), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:96 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:30 (e.g., Ab2), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:97 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:31 (e.g., Ab3), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:98 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:32 (e.g., Ab4), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:99 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:33 (e.g., Ab5), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:100 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:34 (e.g., Ab6), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:101 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:35 (e.g., Ab7), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:102 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:36 (e.g., Ab8), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:103 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:37 (e.g., Ab9), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:104 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:38 (e.g., Ab10), an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:105 and a heavy

chain variable domain amino acid sequence as set forth in SEQ ID NO:39 (e.g., Ab11); an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:163 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:145 (e.g., Ab30); an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:164 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:146 (e.g., Ab32); or an antibody comprising a light chain variable domain amino acid sequence as set forth in SEQ ID NO:165 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:147 (e.g., Ab33). In preferred ~~embodiments~~examples, the ST2 antigen binding protein inhibits binding of IL-33 to ST2. In particularly preferred ~~embodiments~~examples, the autoimmune or inflammatory disorder is asthma, inflammatory bowel disease, rheumatoid arthritis, psoriasis, atopic dermatitis, fibrosis, chronic obstructive pulmonary disease, systemic lupus erythematosus, sclerosis, Wegener's granulomatosis, Behchet disease, rhinosinusitis, nasal polyposis, eosinophilic bronchitis, and cardiovascular disease.

[0059] In ~~a thirteenth~~another aspect, the ~~invention~~present disclosure provides a method of making an ST2 antigen binding protein of any one of the first, second, third, fourth, fifth, sixth, sixth, seventh, or eighth ~~aspects~~examples by culturing a recombinant host cell of the eleventh ~~aspect~~example and isolating the ST2 antigen binding protein from said culture.

[0060] In another aspect, there is provided an isolated ST2 antibody, wherein the ST2 antibody cross-competes with an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:85 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:19.In a fourteenth ~~aspect~~example, the ~~invention~~present disclosure provides ST2 antigen binding proteins of any one of the first, second, third, fourth, fifth, sixth, sixth, seventh, or eighth ~~aspects~~examples that cross-compete with an antibody selected from the group consisting of:

[0061] a) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:84 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:18;

[0062] b) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:85 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:19;

[0063] c) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:86 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:20;

[0064] d) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:87 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:21;

[0065] e) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:88 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:22;

[0066] f) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:89 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:23;

[0067] g) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:90 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:24;

[0068] h) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:91 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:25;

[0069] i) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:92 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:26;

[0070] j) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:93 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:27;

[0071] k) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:94 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:28;

[0072] l) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:160 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:142;

[0073] m) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:161 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:143; and

[0074] n) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:162 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:144.

[0075] In a fifteenth ~~aspect~~example, the ~~invention~~present disclosure provides an isolated ST2 antigen binding protein, preferably an antibody or antigen binding fragment thereof, that binds a polypeptide comprising human ST2 domain 1 and domain 2 (SEQ ID NO:175), wherein binding is significantly inhibited when a single mutation is introduced into human ST2 domain 1 or domain

2 of the polypeptide, wherein the single mutation is selected from the group consisting of L14R, I15R, S33R, E43R, V47R, A62R, G65R, T79R, D92R, D97R, V104R, G138R, N152R, and V176R. By "significantly inhibited" it is meant that the measured difference in binding is statistically significant. In preferred ~~embodiments~~examples, binding is significantly inhibited for two or more members of the group including all members of the group. In certain ~~embodiments~~examples of the fifteenth ~~aspect~~example, binding also is significantly activated when a single mutation is introduced into human ST2 domain 1 or domain 2 of the polypeptide, wherein the single mutation is selected from the group consisting of L53R, R72A, and S73R. By "significantly activated" it is meant that the measured difference in binding is statistically significant. In preferred ~~embodiments~~examples, binding is significantly activated for all members of the group. In certain ~~embodiments~~examples of the fifteenth ~~aspect~~example, the ST2 binding protein cross-competes for binding to human ST2 with an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:85 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:19. In particularly preferred ~~embodiments~~examples, the antigen binding protein is an antigen binding protein of the first, second, third, fourth, fifth, sixth, seventh, or eighth ~~aspect~~example.

[0076] In yet another aspect, there is provided an isolated ST2 antibody, wherein said ST2 antibody binds an ST2 comprising amino acids 19-322 of SEQ ID NO:1 within amino acids 33-44 or 88-94 of SEQ ID NO:1 as determined by hydrogen/deuterium exchange analysis. In yet another aspect, there is provided an isolated ST2 antibody which binds to ST2 creating an interface, wherein the interface created by said binding comprises ST2 residue K1, F2, P19, R20, Q21, G22, K23, Y26, I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, or Y81. In a sixteenth ~~aspect~~example, the ~~invention~~present disclosure provides an antigen binding protein of the first, second, third, fourth, fifth, sixth, seventh, eighth, fourtheenth, or fifteenth ~~aspect~~example wherein said ST2 binding protein preferably an antibody or antigen binding fragment thereof, binds a portion of ST2 comprising amino acids 33-44 and/or 88-94 of SEQ ID NO:1 as determined by hydrogen/deuterium exchange analysis.

[0077] In a seventeenth ~~aspect~~example, the ~~invention~~present disclosure provides an antigen binding protein preferably an antibody or antigen binding fragment thereof, of the first, second, third, fourth, fifth, sixth, seventh, eighth, fourtheenth, fifteenth, or sixteenth ~~aspect~~example which binds to ST2 creating an interface, wherein the interface created by said binding comprises an ST2 residue selected from the group consisting of K1, F2, P19, R20, Q21, G22, K23, Y26, I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, and Y81. In preferred embodiments of the seventeenth aspect, the interface created by said binding comprises ST2 residue P19, R20, Q21, G22, K23, and/or Y26, ST2 residue I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, and/or Y81, or ST2 residues P19, R20, Q21, G22, K23, Y26, I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, and Y81. The interface may be detrmined by solvent exposure difference between bound and unbound ST2 and interface residues are defined as those amino acids having a difference greater than 10% and those that form water-mediated hydrogen bonds with said antibody or determined by as those amino acids having at least one atom within 5Å of the antibody.

[0078] In an eighteenth ~~aspect~~example, the ~~invention~~present disclosure provides an isolated ST2 antigen binding protein, preferably an antibody or antigen binding fragment thereof, comprising a) a light chain variable domain having at least 90% or at least 95% identity to the amino acid sequence set forth in SEQ ID NO:96, b) a heavy chain variable domain having at least 90% or at least 95% identity to the amino acid sequence set forth in SEQ ID NO:30; c) a light chain variable domain of a) and a heavy chain variable domain of b), d) a light chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth SEQ ID NO:96; e) a heavy chain variable domain having no more than ten or no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:30; f) a light chain variable domain of d) and the heavy chain variable domain of e), g) a light chain variable domain comprising an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:107; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:118; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:129, h) a heavy chain variable domain comprising an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:41; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:52; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:63, or i) a light chain variable domain of g) and the heavy chain variable domain of h).

[0079] In preferred embodiments of the eighteenth ~~aspect~~example, the light chain variable region comprises D28 or a conservative substitution thereof, I29 or a conservative substitution thereof, S30 or a conservative substitution thereof, N31 or a conservative substitution thereof, Y32 or a conservative substitution thereof, Y49 or a conservative substitution thereof, D50 or a conservative substitution thereof, N53 or a conservative substitution thereof, E55 or a conservative substitution thereof, T56 or a conservative substitution thereof, D91 or a conservative substitution thereof, D92 or a conservative substitution thereof, N93 or a conservative substitution thereof, F94 or a conservative substitution thereof, or L96 or a conservative substitution thereof. In other preferred embodiments, the light chain variable region comprises D28 or a conservative substitution thereof, N31 or a conservative substitution thereof, D50 or a conservative substitution thereof, N53 or a conservative substitution thereof, E55 or a conservative substitution thereof, D91 or a conservative substitution thereof, and D92 or a

conservative substitution thereof. In still other preferred embodiments, the light chain variable region comprises D28, N31, D50, N53, E55, D91, and D92.

[0080] The eighteenth ~~aspect~~example also includes ST2 binding proteins, preferably antibodies or antigen binding fragment therof, wherein the heavy chain variable region comprises W33 or a conservative substitution thereof, I50 or a conservative substitution thereof, D57 or a conservative substitution thereof, R59 or a conservative substitution thereof, H99 or a conservative substitution thereof, G100 or a conservative substitution thereof, T101 or a conservative substitution thereof, S102 or a conservative substitution thereof, S103 or a conservative substitution thereof, D104 or a conservative substitution thereof, Y105 or a conservative substitution thereof, or Y106 or a conservative substitution thereof; wherein the heavy chain variable region comprises S102 or a conservative substitution thereof, S103 or a conservative substitution thereof, D104 or a conservative substitution thereof, and Y105 or a conservative substitution thereof; and wherein the heavy chain variable region comprises S102, S103, D104, and Y105.

[0081] In certain embodiments of the eighteeth ~~aspect~~example, the ST2 antigen binding protein specifically binds human ST2 with an affinity of less than or equal to 1×10^{-10} M, inhibits binding of human ST2 to human IL-33, reduces human IL-33-mediated ST2 signaling in human ST2-expressing cells, inhibits binding of cynomolgus monkey ST2 to cynomolgus monkey IL-33, reduces IL-33-mediated cynomolgus monkey ST2 signaling in cynomolgus monkey ST2-expressing cells, and/or is an antibody such as a human antibody.

BRIEF DESCRIPTION OF THE DRAWINGS

[0082] FIG. 1 ST2 mAb treatment significantly inhibited IL-33-induced IL-5 in the bronchoalveolar lavage fluid (BALF) Balb/c and C57Bl/6 mice.

[0083] FIG. 2 ST2 mAb treatment is efficacious in a cockroach allergen (CRA)-induced model of asthma. ST2 antibody-treated mice had significantly fewer BALF eosinophils than isotype control Ig-treated mice.

[0084] FIG. 3 ST2 mAbs in the inhibition of human IL-33-induced IL-5 production from CD4+ T cells from various donors. The (—) line depicts the positive control value of human IL-33 in combination with human IL-2 without inhibition. The (· · · ·) depicts the positive control value of human IL-2. The (- -) line depicts the media control value.

[0085] FIG. 4 Dose response of human IL-33 in human NK cell assay.

What is claimed:

1. An isolated ST2 antibody comprising:

a) a light chain variable domain having at least 90% identity to the amino acid sequence set forth in SEQ ID NO:96;

b) a heavy chain variable domain having at least 90% identity to the amino acid sequence set forth in SEQ ID NO:30; or

c) a light chain variable domain of a) and a heavy chain variable domain of b).

2. The ST2 antibody of claim 1, wherein the light chain variable domain has at least 95% identity to the amino acid sequence set forth in SEQ ID NO:96.

3. The ST2 antibody of claim 1 or 2, wherein the heavy chain variable domain has at least 95% identity to the amino acid sequence set forth in SEQ ID NO:30.

4. An isolated ST2 antibody, comprising:

a) a light chain variable domain having no more than ten amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:96;

b) a heavy chain variable domain having no more than ten amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:30; or

c) the light chain variable domain of a) and the heavy chain variable domain of b).

5. The ST2 antibody of claim 4, wherein the light chain variable domain has no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:96.

6. The ST2 antibody of claim 4 or 5, wherein the heavy chain variable domain has no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:30.

7. The ST2 antibody of claim 1-6, wherein the light chain variable domain comprises the amino acid sequence set forth in SEQ ID NO:96.

8. The ST2 antibody of claim 1-7, wherein the heavy chain variable domain comprises the amino acid sequence set forth in SEQ ID NO:30.

9. An isolated ST2 antibody comprising:

a) a light chain variable domain comprising an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:107; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:118; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:129; and

b) a heavy chain variable domain comprising an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:41; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:52; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:63.

10. The isolated ST2 antibody of any of claim 1-9, wherein said light chain variable region comprises D28 or a conservative substitution thereof, I29 or a conservative substitution thereof, S30 or a conservative substitution thereof, N31 or a conservative substitution thereof, Y32 or a conservative substitution thereof, Y49 or a conservative substitution thereof, D50 or a conservative substitution thereof, N53 or a conservative substitution thereof, E55 or a conservative substitution thereof, T56 or a conservative substitution thereof, D91 or a conservative substitution thereof, D92 or a conservative substitution thereof, N93 or a conservative substitution thereof, F94 or a conservative substitution thereof, or L96 or a conservative substitution thereof.

11. The isolated ST2 antibody of claim 10, wherein said light chain variable region comprises D28 or a conservative substitution thereof, N31 or a conservative substitution thereof, D50 or a conservative substitution thereof, N53 or a conservative substitution thereof, E55 or a conservative substitution thereof, D91 or a conservative substitution thereof, and D92 or a conservative substitution thereof.

12. The isolated ST2 antibody of claim 11, wherein said light chain variable region comprises D28, N31, D50, N53, E55, D91, and D92.

13. The isolated ST2 antibody of any of claim 1-12, wherein said heavy chain variable region comprises W33 or a conservative substitution thereof, I50 or a conservative substitution thereof, D57 or a conservative substitution thereof, R59 or a conservative substitution thereof, H99 or a conservative substitution thereof, G100 or a conservative substitution thereof, T101 or a conservative substitution thereof, S102 or a conservative substitution thereof, S103 or a conservative substitution thereof, D104 or a conservative substitution thereof, Y105 or a conservative substitution thereof, or Y106 or a conservative substitution thereof.

14. The isolated ST2 antibody of claim 13, wherein said heavy chain variable region comprises S102 or a conservative substitution thereof, S103 or a conservative substitution thereof, D104 or a conservative substitution thereof, and Y105 or a conservative substitution thereof.

15. The isolated ST2 antibody of claim 14, wherein said heavy chain variable region comprises S102, S103, D104, and Y105.

16. The ST2 antibody of any of claims 1-15, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:107; an LCDR2 sequence as set forth in SEQ ID NO:118; and an LCDR3 sequence as set forth in SEQ ID NO:129; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:41; an HCDR2 sequence as set forth in SEQ ID NO:52; and an HCDR3 sequence as set forth in SEQ ID NO:63.

17. The ST2 antibody of any of claims 1-15, wherein the antibody specifically binds human ST2 with an affinity of less than or equal to 1×10^{-10} M.

18. The ST2 antibody of any of claims 1-17, wherein the antibody inhibits binding of human ST2 to human IL-33.

19. The ST2 antibody of any of claims 1-18, wherein the antibody reduces human IL-33-mediated ST2 signaling in human ST2-expressing cells.

20. The ST2 antibody of claim 18, wherein the antibody inhibits binding of cynomolgus monkey ST2 to cynomolgus monkey IL-33.

21. The ST2 antibody of claim 20, wherein the antibody reduces IL-33-mediated cynomolgus monkey ST2 signaling in cynomolgus monkey ST2-expressing cells.

22. The ST2 antibody of any of claims 1-21, wherein the antibody is a human antibody.

23. The ST2 antibody of claim 22 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:85 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:19.

24. An isolated nucleic acid encoding a light chain variable domain of an antibody of any of claims 1-23.

25. An isolated nucleic acid encoding a heavy chain variable domain of an antibody of any of claims 1-23.

26. An isolated nucleic acid encoding a light chain variable domain and a heavy chain variable domain of an antibody of any of claims 1-23.

27. The isolated nucleic acid of claim 24, wherein the nucleic acid encodes an antibody light chain.

28. The isolated nucleic acid of claim 27, wherein the light chain is encoded by a nucleic acid comprising a nucleotide sequence at least 80% identical to the nucleotide sequence set forth in SEQ ID NO:74.

29. The isolated nucleic acid of claim 27, wherein the light chain is encoded by a nucleic acid comprising a nucleotide sequence at least 90% identical to the nucleotide sequence set forth in SEQ ID NO:74.

30. The isolated nucleic acid of claim 27, wherein the light chain is encoded by a nucleic acid comprising a nucleotide sequence at least 95% identical to the nucleotide sequence set forth in SEQ ID NO:74.

31. The isolated nucleic acid of claim 27, wherein the light chain is encoded by a nucleic acid comprising a nucleotide sequence set forth in SEQ ID NO:74.

32. The isolated nucleic acid of claim 25, wherein the nucleic acid encodes an antibody heavy chain.

33. The isolated nucleic acid of claim 32, wherein the heavy chain is encoded by a nucleic acid comprising a nucleotide sequence at least 80% identical to the nucleotide sequence set forth in SEQ ID NO:8.

34. The isolated nucleic acid of claim 32, wherein the heavy chain is encoded by a nucleic acid comprising a nucleotide sequence at least 90% identical to the nucleotide sequence set forth in SEQ ID NO:8.

35. The isolated nucleic acid of claim 32, wherein the heavy chain is encoded by a nucleic acid comprising a nucleotide sequence at least 95% identical to the nucleotide sequence set forth in SEQ ID NO:8.

36. The isolated nucleic acid of claim 32, wherein the heavy chain is encoded by a nucleic acid comprising a nucleotide sequence set forth in SEQ ID NO:8.

37. An expression vector comprising the isolated nucleic acid of any of claims 24-36.

38. A recombinant host cell comprising an isolated nucleic acid of any of claims 24-36 operably linked to a promoter.

39. A recombinant host cell comprising an expression vector of claim 37.

40. The recombinant host cell of claim 39, wherein the host cell secretes an antibody that binds ST2.

41. The recombinant host cell of any of claims 39-40, wherein the cell is of mammalian origin.

42. The recombinant host cell of claim 41, wherein the cell is a Chinese hamster ovary (CHO) cell line.

43. Use of a ST2 antibody of any one of claims 1-23 in the manufacture of a medicament for treating an autoimmune or inflammatory disorder to a patient in need thereof.

44. The use of claim 43, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:96 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:30.

45. The use of claim 44, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:85 and a heavy chain amino acid sequence as set forth in SEQ ID NO:19.

46. The use of any of claims 43-45, wherein the antibody inhibits binding of IL-33 to ST2.

47. The use of claim 46, wherein the autoimmune or inflammatory disorder is asthma, atopic dermatitis, chronic obstructive pulmonary disease, pulmonary fibrosis, sepsis and trauma, systemic lupus erythematosus, inflammatory bowel disease, rheumatoid arthritis, sclerosis, Wegener's granulomatosis, Behchet disease, cardiovascular disease, rhinosinusitis, nasal polyposis, or eosinophilic bronchitis.

48. A method of making an ST2 antibody, the method comprising:

a) culturing a recombinant host cell of any one of claims 39-42; and

b) isolating the ST2 antibody from said culture.

49. An isolated ST2 antibody, wherein the ST2 antibody cross-competes with an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:85 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:19.

50. The isolated ST2 antibody of claim 49, wherein said ST2 antibody is an ST2 antibody of any of claims 1-23.

51. An isolated ST2 antibody, wherein said ST2 antibody binds an ST2 comprising amino acids 19-322 of SEQ ID NO:1 within amino acids 33-44 or 88-94 of SEQ ID NO:1 as determined by hydrogen/deuterium exchange analysis.

52. The isolated ST2 antibody of claim 51, wherein said ST2 antibody binds within amino acids 33-44 and 88-94 of SEQ ID NO:1 as determined by hydrogen/deuterium exchange analysis.

53. The isolated ST2 antibody of claim 52, wherein said ST2 binding protein is an ST2 binding protein of any of claims 1-23.

54. An isolated ST2 antibody which binds to ST2 creating an interface, wherein the interface created by said binding comprises ST2 residue K1, F2, P19, R20, Q21, G22, K23, Y26, I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, or Y81.

55. The isolated ST2 antibody of claim 54, wherein the interface created by said binding comprises ST2 residue P19, R20, Q21, G22, K23, or Y26.

56. The isolated ST2 antibody of claim 55, wherein the interface created by said binding comprises ST2 residues P19, R20, Q21, G22, K23, and Y26.

57. The isolated ST2 antibody of claim 54, wherein the interface created by said binding comprises ST2 residue I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, or Y81.

58. The isolated ST2 antibody of claim 57, wherein the interface created by said binding comprises ST2 residues I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, and Y81.

59. The isolated ST2 antibody of claim 54, wherein the interface created by said binding comprises ST2 residues P19, R20, Q21, G22, K23, Y26, I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, and Y81.

60. The isolated ST2 antibody of claim 59, wherein the interface created by said binding comprises ST2 residues K1, F2, P19, R20, Q21, G22, K23, Y26, I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, and Y81.

61. The isolated ST2 antibody of any of claim 54-60, wherein the interface is determined by solvent exposure difference between bound and unbound ST2 wherein interface residues are defined as those amino acids having a difference greater than 10% and those that form water-mediated hydrogen bonds with said antibody.

62. The isolated ST2 antibody of any of claim 54-60, wherein the interface residues are defined as those amino acids having at least one atom within 5Å of said antibody.

CLAIMS

What is claimed:

1. An isolated ST2 antigen binding protein comprising:

a) a light chain variable domain having at least 90% identity to the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165;

b) a heavy chain variable domain having at least 90% identity to the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:145, SEQ ID NO:146, or SEQ ID NO:147; or

c) a light chain variable domain of a) and a heavy chain variable domain of b).

2. The ST2 antigen binding protein of claim 1, wherein the light chain variable domain has at least 95% identity to the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165.

3. The ST2 antigen binding protein of claim 1 or 2, wherein the heavy chain variable domain has at least 95% identity to the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:145, SEQ ID NO:146, or SEQ ID NO:147.

4. An isolated ST2 antigen binding protein, comprising:

a) a light chain variable domain having no more than ten amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165;

b) a heavy chain variable domain having no more than ten amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, SEQ

ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:145, SEQ ID NO:146, or SEQ ID NO:147; or

c) the light chain variable domain of a) and the heavy chain variable domain of b).

5. The ST2 antigen binding protein of claim 4, wherein the light chain variable domain has no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165.

6. The ST2 antigen binding protein of claim 4 or 5, wherein the heavy chain variable domain has no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:145, SEQ ID NO:146, or SEQ ID NO:147.

7. The ST2 antigen binding protein of claim 1-6, wherein the light chain variable domain comprises the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165.

8. The ST2 antigen binding protein of claim 1-7, wherein the heavy chain variable domain comprises the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:145, SEQ ID NO:146, or SEQ ID NO:147.

9. An isolated ST2 antigen binding protein comprising:
a light chain variable domain comprising:

a) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:106; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:117; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:128;

b) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:107; an LCDR2 having no more

than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:118; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:129;

c) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:108; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:119; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:130;

d) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:109; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:120; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:131;

e) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:110; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:121; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:132;

f) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:111; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:122; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:133;

g) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:112; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:123; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:134;

h) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:113; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:124; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:135;

i) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:114; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:125; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:136;

j) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:115; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:126; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:137;

k) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:116; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:127; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:138;

l) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:166; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:169; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:172;

m) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:167; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:170; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:173; or

n) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:168; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:171; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:174;

and

a heavy chain variable domain comprising:

o) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:40; an HCDR2 having no more

than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:51; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:62;

p) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:41; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:52; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:63;

q) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:42; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:53; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:64;

r) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:43; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:54; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:65;

s) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:44; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:55; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:66;

t) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:45; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:56; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:67;

u) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:46; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:57; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:68;

v) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:47; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:58; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:69;

w) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:48; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:59; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:70;

x) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:49; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:60; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:71; or

y) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:50; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:61; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:72;

z) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:148; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:151; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:154;

aa) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:149; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:152; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:155; or

bb) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:150; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set

forth in SEQ ID NO:153; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:156.

10. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of a) and the heavy chain variable domain of o).

11. The ST2 antigen binding protein of claim 10, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:106; an LCDR2 sequence as set forth in SEQ ID NO:117; and an LCDR3 sequence as set forth in SEQ ID NO:128; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:40; an HCDR2 sequence as set forth in SEQ ID NO:51; and an HCDR3 sequence as set forth in SEQ ID NO:62.

12. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of b) and the heavy chain variable domain of p).

13. The ST2 antigen binding protein of claim 12, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:107; an LCDR2 sequence as set forth in SEQ ID NO:118; and an LCDR3 sequence as set forth in SEQ ID NO:129; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:41; an HCDR2 sequence as set forth in SEQ ID NO:52; and an HCDR3 sequence as set forth in SEQ ID NO:63.

14. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of c) and the heavy chain variable domain of q).

15. The ST2 antigen binding protein of claim 14, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:108; an LCDR2 sequence as set forth in SEQ ID NO:119; and an LCDR3 sequence as set forth in SEQ ID NO:130; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:42; an HCDR2 sequence as set forth in SEQ ID NO:53; and an HCDR3 sequence as set forth in SEQ ID NO:64.

16. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of d) and the heavy chain variable domain of r).

17. The ST2 antigen binding protein of claim 16, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:109; an LCDR2 sequence as set forth in SEQ ID NO:120; and an LCDR3 sequence as set forth in SEQ ID NO:131; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:43; an HCDR2 sequence as set forth in SEQ ID NO:54; and an HCDR3 sequence as set forth in SEQ ID NO:65.

18. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of e) and the heavy chain variable domain of s).

19. The ST2 antigen binding protein of claim 18, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:110; an LCDR2 sequence as set forth in SEQ ID NO:121; and an LCDR3 sequence as set forth in SEQ ID NO:132; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:44; an HCDR2 sequence as set forth in SEQ ID NO:55; and an HCDR3 sequence as set forth in SEQ ID NO:66.

20. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of f) and the heavy chain variable domain of t).

21. The ST2 antigen binding protein of claim 20, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:111; an LCDR2 sequence as set forth in SEQ ID NO:122; and an LCDR3 sequence as set forth in SEQ ID NO:133; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:45; an HCDR2 sequence as set forth in SEQ ID NO:56; and an HCDR3 sequence as set forth in SEQ ID NO:67.

22. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of g) and the heavy chain variable domain of u).

23. The ST2 antigen binding protein of claim 22, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:112; an LCDR2 sequence as set forth in SEQ ID NO:123; and an LCDR3 sequence as set forth in SEQ ID NO:134; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:46; an HCDR2 sequence as set forth in SEQ ID NO:57; and an HCDR3 sequence as set forth in SEQ ID NO:68.

24. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of h) and the heavy chain variable domain of v).

25. The ST2 antigen binding protein of claim 24, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:113; an LCDR2 sequence as set forth in SEQ ID NO:124; and an LCDR3 sequence as set forth in SEQ ID NO:135; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:47; an HCDR2 sequence as set forth in SEQ ID NO:58; and an HCDR3 sequence as set forth in SEQ ID NO:69.

26. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of i) and the heavy chain variable domain of w).

27. The ST2 antigen binding protein of claim 26, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:114; an LCDR2 sequence as set forth in SEQ ID NO:125; and an LCDR3 sequence as set forth in SEQ ID NO:136; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:48; an HCDR2 sequence as set forth in SEQ ID NO:59; and an HCDR3 sequence as set forth in SEQ ID NO:70.

28. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of j) and the heavy chain variable domain of x).

29. The ST2 antigen binding protein of claim 28, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:115; an LCDR2 sequence as set forth in SEQ ID NO:126; and an LCDR3 sequence as set forth in SEQ ID NO:137; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:49; an HCDR2 sequence as set forth in SEQ ID NO:60; and an HCDR3 sequence as set forth in SEQ ID NO:71.

30. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of k) and the heavy chain variable domain of y).

31. The ST2 antigen binding protein of claim 30, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:116; an LCDR2 sequence as set forth in SEQ ID NO:127; and an LCDR3 sequence as set forth in SEQ ID NO:138; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:50; an HCDR2 sequence as set forth in SEQ ID NO:61; and an HCDR3 sequence as set forth in SEQ ID NO:72.

32. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of l) and the heavy chain variable domain of z).

33. The ST2 antigen binding protein of claim 32, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:166; an LCDR2 sequence as set forth in SEQ ID NO:169; and an LCDR3 sequence as set forth in SEQ ID NO:172; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:148; an HCDR2 sequence as set forth in SEQ ID NO:151; and an HCDR3 sequence as set forth in SEQ ID NO:154.

34. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of m) and the heavy chain variable domain of aa).

35. The ST2 antigen binding protein of claim 34, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:167; an LCDR2 sequence as set forth in SEQ

ID NO:170; and an LCDR3 sequence as set forth in SEQ ID NO:173; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:149; an HCDR2 sequence as set forth in SEQ ID NO:152; and an HCDR3 sequence as set forth in SEQ ID NO:155.

36. The ST2 antigen binding protein of claim 9 comprising the light chain variable domain of n) and the heavy chain variable domain of bb).

37. The ST2 antigen binding protein of claim 36, wherein the light chain variable domain comprises an LCDR1 as set forth in SEQ ID NO:168; an LCDR2 sequence as set forth in SEQ ID NO:171; and an LCDR3 sequence as set forth in SEQ ID NO:174; and the heavy chain variable domain comprises an HCDR1 as set forth in SEQ ID NO:150; an HCDR2 sequence as set forth in SEQ ID NO:153; and an HCDR3 sequence as set forth in SEQ ID NO:156.

38. The ST2 antigen binding protein of any of claims 1-37, wherein the antigen binding protein specifically binds human ST2 with an affinity of less than or equal to 1×10^{-10} M.

39. The ST2 antigen binding protein of any of claims 1-38, wherein the antigen binding protein inhibits binding of human ST2 to human IL-33.

40. The ST2 antigen binding protein of any of claims 1-39, wherein the antigen binding protein reduces human IL-33-mediated ST2 signaling in human ST2-expressing cells.

41. The ST2 antigen binding protein of claim 39, wherein the antigen binding protein inhibits binding of cynomolgus monkey ST2 to cynomolgus monkey IL-33.

42. The ST2 antigen binding protein of claim 41, wherein the antigen binding protein reduces IL-33-mediated cynomolgus monkey ST2 signaling in cynomolgus monkey ST2-expressing cells.

43. The ST2 antigen binding protein of any of claims 1-42, wherein the antigen binding protein is an antibody.

44. The ST2 antigen binding protein of claim 43, wherein the antibody is a human antibody.

45. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:84 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:18.

46. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:85 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:19.

47. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:86 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:20.

48. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:87 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:21.

49. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:88 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:22.

50. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:89 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:23.

51. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:90 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:24.

52. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:91 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:25.

53. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:92 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:26.

54. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:93 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:27.

55. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:94 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:28.

56. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:160 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:142.

57. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:161 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:143.

58. The ST2 antigen binding protein of claim 44 comprising a light chain and a heavy chain, wherein the light chain comprises the amino acid sequence set forth in SEQ ID:162 and the heavy chain comprises the amino acid sequence set forth in SEQ ID NO:144.

59. An isolated nucleic acid encoding a polypeptide, said polypeptide comprising:

a) a light chain variable domain having at least 95% identity to the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165;

b) a heavy chain variable domain having at least 95% identity to the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:145, SEQ ID NO:146, or SEQ ID NO:147;

c) a light chain variable domain having no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:163, SEQ ID NO:164, or SEQ ID NO:165;

d) a heavy chain variable domain having no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:145, SEQ ID NO:146, or SEQ ID NO:147;

e) a light chain variable domain comprising:

i) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:106; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:117; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:128;

ii) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:107; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:118; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:129;

iii) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:108; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:119; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:130;

iv) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:109; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:120; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:131;

v) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:110; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:121; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:132;

vi) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:111; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:122; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:133;

vii) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:112; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in

SEQ ID NO:123; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:134;

viii) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:113; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:124; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:135;

ix) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:114; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:125; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:136;

x) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:115; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:126; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:137;

xi) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:116; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:127; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:138;

xii) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:166; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:169; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:172;

xiii) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:167; an LCDR2 having no more than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:170; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:173; or

xiv) an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:168; an LCDR2 having no more

than three amino acid additions, deletions, or substitutions from the LCDR2 sequence set forth in SEQ ID NO:171; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:174; or

f) a heavy chain variable domain comprising:

i) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:40; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:51; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:62;

ii) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:41; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:52; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:63;

iii) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:42; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:53; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:64;

iv) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:43; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:54; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:65;

v) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:44; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:55; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:66;

vi) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:45; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:56; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:67;

vii) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:46; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:57; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:68;

viii) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:47; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:58; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:69;

ix) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:48; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:59; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:70;

x) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:49; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:60; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:71;

xi) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:50; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:61; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:72;

xii) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:148; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:151; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:154;

xiii) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:149; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID

NO:152; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:155; or

xiv) an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:150; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:153; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:156.

60. The isolated nucleic acid of claim 59, wherein the polypeptide comprises an antibody light chain.

61. The isolated nucleic acid of claim 60, wherein the light chain is encoded by a nucleic acid comprising a nucleotide sequence at least 80% identical to the nucleotide sequence set forth in SEQ ID NO:73, SEQ ID NO:74, SEQ ID NO:75, SEQ ID NO:76, SEQ ID NO:77, SEQ ID NO:78, SEQ ID NO:79, SEQ ID NO:80, SEQ ID NO:81, SEQ ID NO:82, SEQ ID NO:83, SEQ ID NO:157, SEQ ID NO:158, or SEQ ID NO:159.

62. The isolated nucleic acid of claim 61, wherein the light chain is encoded by a nucleic acid comprising a nucleotide sequence at least 90% identical to the nucleotide sequence set forth in SEQ ID NO:73, SEQ ID NO:74, SEQ ID NO:75, SEQ ID NO:76, SEQ ID NO:77, SEQ ID NO:78, SEQ ID NO:79, SEQ ID NO:80, SEQ ID NO:81, SEQ ID NO:82, SEQ ID NO:83, SEQ ID NO:157, SEQ ID NO:158, or SEQ ID NO:159.

63. The isolated nucleic acid of claim 62, wherein the light chain is encoded by a nucleic acid comprising a nucleotide sequence at least 95% identical to the nucleotide sequence set forth in SEQ ID NO:73, SEQ ID NO:74, SEQ ID NO:75, SEQ ID NO:76, SEQ ID NO:77, SEQ ID NO:78, SEQ ID NO:79, SEQ ID NO:80, SEQ ID NO:81, SEQ ID NO:82, SEQ ID NO:83, SEQ ID NO:157, SEQ ID NO:158, or SEQ ID NO:159.

64. The isolated nucleic acid of claim 63, wherein the light chain is encoded by a nucleic acid comprising a nucleotide sequence set forth in SEQ ID NO:73, SEQ ID NO:74, SEQ ID NO:75, SEQ ID NO:76, SEQ ID NO:77, SEQ ID NO:78, SEQ ID NO:79, SEQ ID NO:80, SEQ ID NO:81, SEQ ID NO:82, SEQ ID NO:83, SEQ ID NO:157, SEQ ID NO:158, or SEQ ID NO:159.

65. The isolated nucleic acid of claim 59, wherein the polypeptide comprises an antibody heavy chain.

66. The isolated nucleic acid of claim 65, wherein the heavy chain is encoded by a nucleic acid comprising a nucleotide sequence at least 80% identical to the nucleotide sequence set forth in SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:139, SEQ ID NO:140, or SEQ ID NO:141.

67. The isolated nucleic acid of claim 66, wherein the heavy chain is encoded by a nucleic acid comprising a nucleotide sequence at least 90% identical to the nucleotide sequence set forth in SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:139, SEQ ID NO:140, or SEQ ID NO:141.

68. The isolated nucleic acid of claim 67, wherein the heavy chain is encoded by a nucleic acid comprising a nucleotide sequence at least 95% identical to the nucleotide sequence set forth in SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:139, SEQ ID NO:140, or SEQ ID NO:141.

69. The isolated nucleic acid of claim 68, wherein the heavy chain is encoded by a nucleic acid comprising a nucleotide sequence set forth in SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:139, SEQ ID NO:140, or SEQ ID NO:141.

70. An expression vector comprising the isolated nucleic acid of any of claims 59-69.

71. The expression vector of claim 70, wherein the isolated nucleic acid encodes an antibody light chain.

72. The expression vector of claim 70, wherein the isolated nucleic acid encodes an antibody heavy chain.

73. The expression vector of claim 71, further comprising an isolated nucleic acid encoding an antibody heavy chain.

74. A recombinant host cell comprising an isolated nucleic acid of any of claims 59-69 operably linked to a promoter.

75. A recombinant host cell comprising an expression vector of any of claims 70-73.

76. The recombinant host cell of claim 75, wherein the host cell comprises an expression vector of claim 71 and 72.

77. The recombinant host cell of claim 76, wherein the host cell secretes an antibody that binds ST2.

78. The recombinant host cell of any of claims 74-77, wherein the cell is of mammalian origin.

79. The recombinant host cell of claim 78, wherein the cell is a Chinese hamster ovary (CHO) cell line.

80. A method of treating an autoimmune or inflammatory disorder, said method comprising administering a therapeutically effective amount of a ST2 antigen binding protein of any one of claims 1-58 to a patient in need thereof.

81. The method of claim 80, wherein the ST2 antigen binding protein is an antibody.

82. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:95 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:29.

83. The method of claim 82, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:84 and a heavy chain amino acid sequence as set forth in SEQ ID NO:18.

84. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:96 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:30.

85. The method of claim 84, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:85 and a heavy chain amino acid sequence as set forth in SEQ ID NO:19.

86. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:97 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:31.

87. The method of claim 86 wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:86 and a heavy chain amino acid sequence as set forth in SEQ ID NO:20.

88. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:98 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:32.

89. The method of claim 88, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:87 and a heavy chain amino acid sequence as set forth in SEQ ID NO:21.

90. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:99 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:33.

91. The method of claim 90, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:88 and a heavy chain amino acid sequence as set forth in SEQ ID NO:22.

92. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:100 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:34.

93. The method of claim 92, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:89 and a heavy chain amino acid sequence as set forth in SEQ ID NO:23.

94. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:101 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:35.

95. The method of claim 94, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:90 and a heavy chain amino acid sequence as set forth in SEQ ID NO:24.

96. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:102 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:36.

97. The method of claim 96, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:91 and a heavy chain amino acid sequence as set forth in SEQ ID NO:25.

98. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:103 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:37.

99. The method of claim 98, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:92 and a heavy chain amino acid sequence as set forth in SEQ ID NO:26.

100. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:104 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:38.

101. The method of claim 100, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:93 and a heavy chain amino acid sequence as set forth in SEQ ID NO:27.

102. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:105 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:39.

103. The method of claim 102, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:94 and a heavy chain amino acid sequence as set forth in SEQ ID NO:28.

104. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:163 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:145.

105. The method of claim 104, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:160 and a heavy chain amino acid sequence as set forth in SEQ ID NO:142.

106. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:164 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:146.

107. The method of claim 106, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:161 and a heavy chain amino acid sequence as set forth in SEQ ID NO:143.

108. The method of claim 81, wherein the antibody comprises a light chain variable domain amino acid sequence as set forth in SEQ ID NO:165 and a heavy chain variable domain amino acid sequence as set forth in SEQ ID NO:147.

109. The method of claim 108, wherein the antibody comprises a light chain amino acid sequence as set forth in SEQ ID NO:162 and a heavy chain amino acid sequence as set forth in SEQ ID NO:144.

110. The method of any of claims 80-109 , wherein the antigen binding protein inhibits binding of IL-33 to ST2.

111. The method of claim 110, wherein the autoimmune or inflammatory disorder is asthma, atopic dermatitis, chronic obstructive pulmonary disease, pulmonary fibrosis, sepsis and trauma, HIV infection, systemic lupus erythematosus, inflammatory bowel disease, rheumatoid arthritis, sclerosis, Wegener's granulomatosis, Behchet disease, cardiovascular disease, rhinosinusitis, nasal polyposis, or eosinophilic bronchitis.

112. A method of making an ST2 antigen binding protein, the method comprising:

a) culturing a recombinant host cell of any one of claims 74-79; and

b) isolating the ST2 antigen binding protein from said culture.

113. An isolated ST2 antigen binding protein, wherein the ST2 antigen binding protein cross-competes with:

a) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:85 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:19; or

b) an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:93 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:27.

114. The ST2 antigen binding protein of claim 113, wherein said ST2 binding protein is an ST2 binding protein of any of claims 1-58.

115. The ST2 antigen binding protein of claim 113 or claim 114, wherein the ST2 antigen binding protein cross-competes with an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:85 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:19.

116. An isolated ST2 antigen binding protein that binds a polypeptide comprising human ST2 domain 1 and domain 2 (SEQ ID NO:175), wherein binding is significantly inhibited when a single mutation is introduced into human ST2 domain 1 or domain 2 of the polypeptide, wherein the single mutation is L14R, I15R, S33R, E43R, V47R, A62R, G65R, T79R, D92R, D97R, V104R, G138R, N152R, or V176R.

117. The isolated ST2 antigen binding protein of claim 116, wherein binding is significantly inhibited for two or more of the single mutations.

118. The isolated ST2 antigen binding protein of claim 117, wherein binding is significantly inhibited for all of the single mutations.

119. The isolated ST2 antigen binding protein of claim 116, wherein binding is significantly activated when a single mutation is introduced into human ST2 domain 1 or domain 2 of the polypeptide, wherein the single mutation is L53R, R72A, or S73R.

120. The isolated ST2 antigen binding protein of claim 119, wherein binding is significantly activated for all members of the group.

121. The isolated ST2 antigen binding protein of claim 116, wherein the ST2 binding protein cross-competes for binding to human ST2 with an antibody comprising a light chain comprising the amino acid sequence set forth in SEQ ID:85 and a heavy chain comprising the amino acid sequence set forth in SEQ ID NO:19.

122. The isolated ST2 antigen binding protein of any of claim 116-121, wherein said ST2 binding protein is an ST2 binding protein of any of claims 1-58.

123. An isolated ST2 antigen binding protein, wherein said ST2 antigen binding protein binds an ST2 comprising amino acids 19-322 of SEQ ID NO:1 within amino acids 33-44 or 88-94 of SEQ ID NO:1 as determined by hydrogen/deuterium exchange analysis.

124. The isolated ST2 antigen binding protein of claim 123, wherein said ST2 binding protein binds within amino acids 33-44 and 88-94 of SEQ ID NO:1 as determined by hydrogen/deuterium exchange analysis.

125. The isolated ST2 antigen binding protein of claim 124, wherein said ST2 binding protein is an ST2 binding protein of any of claims 1-58.

126. An isolated ST2 antigen binding protein which binds to ST2 creating an interface, wherein the interface created by said binding comprises ST2 residue K1, F2, P19, R20, Q21, G22, K23, Y26, I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, or Y81.

127. The isolated ST2 antigen binding protein of claim 126, wherein the interface created by said binding comprises ST2 residue P19, R20, Q21, G22, K23, or Y26.

128. The isolated ST2 antigen binding protein of claim 127, wherein the interface created by said binding comprises ST2 residues P19, R20, Q21, G22, K23, and Y26.

129. The isolated ST2 antigen binding protein of claim 126, wherein the interface created by said binding comprises ST2 residue I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, or Y81.

130. The isolated ST2 antigen binding protein of claim 129, wherein the interface created by said binding comprises ST2 residues I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, and Y81.

131. The isolated ST2 antigen binding protein of claim 126, wherein the interface created by said binding comprises ST2 residues P19, R20, Q21, G22, K23, Y26, I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, and Y81.

132. The isolated ST2 antigen binding protein of claim 131, wherein the interface created by said binding comprises ST2 residues K1, F2, P19, R20, Q21, G22, K23, Y26, I70, V71, R72, S73, P74, T75, F76, N77, R78, T79, and Y81.

133. The isolated ST2 antigen binding protein of any of claim 126-131, wherein the interface is determined by solvent exposure difference between bound and unbound ST2 wherein interface

residues are defined as those amino acids having a difference greater than 10% and those that form water-mediated hydrogen bonds with said antibody.

134. The isolated ST2 antigen binding protein of any of claim 126-131, wherein the interface residues are defined as those amino acids having at least one atom within 5Å of said antibody.

135. An isolated ST2 antigen binding protein comprising:

a) a light chain variable domain having at least 90% identity to the amino acid sequence set forth in SEQ ID NO:96;

b) a heavy chain variable domain having at least 90% identity to the amino acid sequence set forth in SEQ ID NO:30; or

c) a light chain variable domain of a) and a heavy chain variable domain of b).

136. The isolated ST2 antigen binding protein of claim 135, wherein the light chain variable domain has at least 95% identity to the amino acid sequence set forth in SEQ ID NO:96.

137. The isolated ST2 antigen binding protein of claim 135 or 136, wherein the heavy chain variable domain has at least 95% identity to the amino acid sequence set forth in SEQ ID NO:30.

138. An isolated ST2 antigen binding protein comprising:

a) a light chain variable domain having no more than ten amino acid additions, deletions or substitutions from the amino acid sequence set forth SEQ ID NO:96;

b) a heavy chain variable domain having no more than ten amino acid additions, deletions or substitutions from the amino acid sequence set forth in SEQ ID NO:30; or

c) a light chain variable domain of a) and the heavy chain variable domain of b).

139. The isolated ST2 antigen binding protein of claim 138, wherein the light chain variable domain has no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth SEQ ID NO:96.

140. The isolated ST2 antigen binding protein of claim 138 or 139, wherein the heavy chain variable domain has no more than five amino acid additions, deletions or substitutions from the amino acid sequence set forth SEQ ID NO:30.

141. An isolated ST2 antigen binding protein comprising:

a) a light chain variable domain comprising an LCDR1 having no more than three amino acid additions, deletions, or substitutions from the LCDR1 sequence set forth in SEQ ID NO:107; an LCDR2 having no more than three amino acid additions, deletions, or substitutions

from the LCDR2 sequence set forth in SEQ ID NO:118; and an LCDR3 having no more than three amino acid additions, deletions, or substitutions from the LCDR3 sequence set forth in SEQ ID NO:129;

b) a heavy chain variable domain comprising an HCDR1 having no more than three amino acid additions, deletions, or substitutions from the HCDR1 sequence set forth in SEQ ID NO:41; an HCDR2 having no more than three amino acid additions, deletions, or substitutions from the HCDR2 sequence set forth in SEQ ID NO:52; and an HCDR3 having no more than three amino acid additions, deletions, or substitutions from the HCDR3 sequence set forth in SEQ ID NO:63; or

c) a light chain variable domain of a) and the heavy chain variable domain of b).

142. The isolated ST2 antigen binding protein of any of claim 135-141, wherein said light chain variable region comprises D28 or a conservative substitution thereof, I29 or a conservative substitution thereof, S30 or a conservative substitution thereof, N31 or a conservative substitution thereof, Y32 or a conservative substitution thereof, Y49 or a conservative substitution thereof, D50 or a conservative substitution thereof, N53 or a conservative substitution thereof, E55 or a conservative substitution thereof, T56 or a conservative substitution thereof, D91 or a conservative substitution thereof, D92 or a conservative substitution thereof, N93 or a conservative substitution thereof, F94 or a conservative substitution thereof, or L96 or a conservative substitution thereof.

143. The isolated ST2 antigen binding protein of claim 142, wherein said light chain variable region comprises D28 or a conservative substitution thereof, N31 or a conservative substitution thereof, D50 or a conservative substitution thereof, N53 or a conservative substitution thereof, E55 or a conservative substitution thereof, D91 or a conservative substitution thereof, and D92 or a conservative substitution thereof.

144. The isolated ST2 antigen binding protein of claim 143, wherein said light chain variable region comprises D28, N31, D50, N53, E55, D91, and D92.

145. The isolated ST2 antigen binding protein of any of claim 135-144, wherein said heavy chain variable region comprises W33 or a conservative substitution thereof, I50 or a conservative substitution thereof, D57 or a conservative substitution thereof, R59 or a conservative substitution thereof, H99 or a conservative substitution thereof, G100 or a conservative substitution thereof, T101 or a conservative substitution thereof, S102 or a conservative substitution thereof, S103 or a conservative substitution thereof, D104 or a conservative

substitution thereof, Y105 or a conservative substitution thereof, or Y106 or a conservative substitution thereof.

146. The isolated ST2 antigen binding protein of claim 145, wherein said heavy chain variable region comprises S102 or a conservative substitution thereof, S103 or a conservative substitution thereof, D104 or a conservative substitution thereof, and Y105 or a conservative substitution thereof.

147. The isolated ST2 antigen binding protein of claim 146, wherein said heavy chain variable region comprises S102, S103, D104, and Y105.

148. The ST2 antigen binding protein of any of claims 113-147, wherein the antigen binding protein specifically binds human ST2 with an affinity of less than or equal to 1×10^{-10} M.

149. The ST2 antigen binding protein of any of claims 113-148, wherein the antigen binding protein inhibits binding of human ST2 to human IL-33.

150. The ST2 antigen binding protein of any of claims 113-149, wherein the antigen binding protein reduces human IL-33-mediated ST2 signaling in human ST2-expressing cells.

151. The ST2 antigen binding protein of claim 149, wherein the antigen binding protein inhibits binding of cynomolgus monkey ST2 to cynomolgus monkey IL-33.

152. The ST2 antigen binding protein of claim 151, wherein the antigen binding protein reduces IL-33-mediated cynomolgus monkey ST2 signaling in cynomolgus monkey ST2-expressing cells.

153. The ST2 antigen binding protein of any of claims 113-152, wherein the antigen binding protein is an antibody.

154. The ST2 antigen binding protein of claim 153, wherein the antibody is a human antibody.