[0039] In another aspect, the present invention is directed to a method for determining whether a subject has a neurite degenerative disorder. The method may comprise measuring the level of RGMa in a sample from the subject; and comparing the level of RGMa in the sample with a normal control. An altered level of RGMa indicates that the subject has a neurite degenerative disorder. An increased level of RGMa as compared to the normal control, indicates that the subject has neurite degenerative disorder. The sample may be a blood sample or a serum sample or a cerebrospinal fluid sample. The step of measuring the level of RGMa in a sample, may be conducted with an immunoassay. The immunoassay may be an enzyme-linked immunosorbent assay (ELISA). The ELISA may be a sandwich ELISA.

[0040] In another aspect, the present invention is directed to an isolated antibody or antibody fragment comprising SEQ ID NOs:1-7 and 67.

[0041] In another aspect, the present invention is directed to an isolated antibody or antibody fragment comprising SEQ ID NOs:1-7 and 68.

[0042] In another aspect, the present invention is directed to an isolated antibody or antibody fragment comprising SEQ ID NOs:1-7 and 69.

[0043] In another aspect, the present invention is directed to an isolated antibody or antibody fragment comprising SEQ ID NOs:1-7 and 70.

[0044] In another aspect, the present invention is directed to an isolated antibody or antibody fragment comprising SEQ ID NOs:1-7 and 71.

[0045] In another aspect, the present invention is directed to an isolated antibody or antibody fragment comprising SEQ ID NOs:1-7 and 72.

[0046] In another aspect, the present invention is directed to an isolated antibody or antibody fragment comprising SEQ ID NOs:1-7 and 73.

In another aspect, the present invention is directed to an isolated monoclonal antibody or antibody fragment comprising SEQ ID NOs:1-7 and 67, 68, 69, 70, 71, 72, or 73, that binds to the RGMa epitope PCKILKCNSEFWSATSGSHAPAS (hRGMa 47-69) (SEQ ID NO:79).

[0047a] In another aspect, there is provided an isolated antibody or antibody fragment thereof which binds to Repulsive Guidance Molecule a ("RGMa"), wherein the antibody or antibody fragment comprises a heavy chain variable region comprising a complementarity determining region (CDR)1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ

ID NO:4, and a light chain variable region comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:73.

[0047b] In another aspect, there is provided the use of the antibody or antibody fragment as disclosed herein in the manufacture of a medicament for the treatment, prevention, modulation, or attenuation of a disease or disorder associated with neurite degeneration.

[0047c] In another aspect, there is provided a method for determining whether a subject has a neurite degenerative disorder, comprising

(a) measuring the level of RGMa in a sample isolated from the subject, wherein the level of RGMa in the sample is determined using the antibody or antibody fragment as described herein; and

(b) comparing the level of RGMa in the sample with a normal control,

wherein an altered level of RGMa indicates that the subject has a neurite degenerative disorder.

We claim:

1. An isolated antibody or antibody fragment thereof which binds to Repulsive Guidance Molecule a ("RGMa"), wherein the antibody comprises a domain or region selected from the group consisting of: (a) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:1, (b) a variable light domain region comprising the amino acid sequence of SEQ ID NO:5, (c) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:9, (d) a variable light domain region comprising the amino acid sequence of SEQ ID NO:13, (e) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:17, (f) a variable light domain region comprising the amino acid sequence of SEQ ID NO:21, (g) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:25, (h) a variable light domain region comprising the amino acid sequence of SEQ ID NO:29, (i) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:33, (j) a variable light domain region comprising the amino acid sequence of SEQ ID NO:37; (k) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:41; (l) a variable light domain region comprising the amino acid sequence of SEQ ID NO:45; (m) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:49; (n) a variable light domain region comprising the amino acid sequence of SEQ ID NO:53, (o) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:57, (p) a variable light domain region comprising the amino acid sequence of SEQ ID NO:61, (q) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:152, (r) a variable light domain region comprising the amino acid sequence of SEQ ID NO:95, (s) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:99, (t) a variable light domain region comprising the amino acid sequence of SEQ ID NO:103, (u) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:107, (v) a variable light domain region comprising the amino acid sequence of SEQ ID NO:111, (w) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:115, (x) a variable light domain region comprising the amino acid sequence of SEQ ID NO:119, (y) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:123, (z) a variable light domain region comprising the amino acid sequence of SEQ ID NO:127, (aa) a variable heavy domain region comprising the amino acid

sequence of SEQ ID NO:131, (bb) a variable light domain region comprising the amino acid sequence of SEQ ID NO:135, (cc) a variable light domain region comprising the amino acid sequence of SEQ ID NO:67, (dd) a variable light domain region comprising the amino acid sequence of SEQ ID NO:68, (ee) a variable light domain region comprising the amino acid sequence of SEQ ID NO:69 (ff) a variable light domain region comprising the amino acid sequence of SEQ ID NO:70, (gg) a variable light domain region comprising the amino acid sequence of SEQ ID NO:71, (hh) a variable light domain region comprising the amino acid sequence of SEQ ID NO:72, (ii) a variable light domain region comprising the amino acid sequence of SEQ ID NO:73, (jj) a variable heavy domain comprising the amino acid sequence of SEQ ID NO:1 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:5, (kk) a variable heavy domain comprising the amino acid sequence of SEQ ID NO:9 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:13, (ll) a variable heavy domain comprising the amino acid sequence of SEQ ID NO:17 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:21, (mm) a variable heavy domain comprising the amino acid sequence of SEQ ID NO:25 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:29, (nn) a variable heavy domain comprising the amino acid sequence of SEQ ID NO:33 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:37, (oo) a variably heavy domain comprising the amino acid sequence of SEQ ID NO:41 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:45, (pp) a variable heavy domain comprising the amino acid sequence of SEQ ID NO:49 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:53, (qq) a variable heavy domain comprising the amino acid sequence of SEQ ID NO:57 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:61, (rr) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:152 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:95, (ss) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:99 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:103, (tt) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:107 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:111, (uu) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:115 and a variable light domain region

comprising the amino acid sequence of SEQ ID NO:119, (vv) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:123 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:127, (ww) a variable heavy domain region comprising the amino acid sequence of SEQ ID NO:131 and a variable light domain region comprising the amino acid sequence of SEQ ID NO:135, (xx) a variable heavy chain comprising a complementarity determining region (CDR)1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4, (yy) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:8, (zz) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:10, a CDR2 comprising the amino acid sequence of SEQ ID NO:11, and a CDR3 comprising the amino acid sequence of SEQ ID NO:12, (aaa) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:14, a CDR2 comprising the amino acid sequence of SEQ ID NO:15, and a CDR3 comprising the amino acid sequence of SEQ ID NO:16, (bbb) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:18, a CDR2 comprising the amino acid sequence of SEQ ID NO:19, and a CDR3 comprising the amino acid sequence of SEQ ID NO:20, (ccc) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:22, a CDR2 comprising the amino acid sequence of SEQ ID NO:23, and a CDR3 comprising the amino acid sequence of SEQ ID NO:24, (ddd) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:26, a CDR2 comprising the amino acid sequence of SEQ ID NO:27, and a CDR3 comprising the amino acid sequence of SEQ ID NO:28, (eee) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:30, a CDR2 comprising the amino acid sequence of SEQ ID NO:31, and a CDR3 comprising the amino acid sequence of SEQ ID NO:32, (fff) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:34, a CDR2 comprising the amino acid sequence of SEQ ID NO:35, and a CDR3 comprising the amino acid sequence of SEQ ID NO:36, (ggg) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:38, a CDR2 comprising the amino acid sequence of SEQ ID NO:39, and a CDR3 comprising the amino acid sequence of SEQ ID NO:40, (hhh) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of

SEQ ID NO:42, a CDR2 comprising the amino acid sequence of SEQ ID NO:43, and CDR3 comprising the amino acid sequence of SEQ ID NO:44; (iii) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:46, a CDR2 comprising the amino acid sequence of SEQ ID NO:47, and a CDR3 comprising the amino acid sequence of SEQ ID NO:48; (jjj) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:50, a CDR2 comprising the amino acid sequence of SEQ ID NO:51, and a CDR3 comprising the amino acid sequence of SEQ ID NO:52 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:54, a CDR2 comprising the amino acid sequence of SEQ ID NO:55, and a CDR3 comprising the amino acid sequence of SEQ ID NO:56, (kkk) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:58, a CDR2 comprising the amino acid sequence of SEQ ID NO:59, and a CDR3 comprising the amino acid sequence of SEQ ID NO:60, (lll) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:62, a CDR2 comprising the amino acid sequence of SEQ ID NO:63, and a CDR3 comprising the amino acid sequence of SEQ ID NO:64, (mmm) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:92 or 153, a CDR2 comprising the amino acid sequence of SEQ ID NO:93 or 154, and a CDR3 comprising the amino acid sequence of SEQ ID NO:94 or 155, (nnn) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:96 or 156, a CDR2 comprising the amino acid sequence of SEQ ID NO:97 or 157, and a CDR3 comprising the amino acid sequence of SEQ ID NO:98 or 158, (ooo) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:100, a CDR2 comprising the amino acid sequence of SEQ ID NO:101, and a CDR3 comprising the amino acid sequence of SEQ ID NO:102, (ppp) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:104, a CDR2 comprising the amino acid sequence of SEQ ID NO:105, and a CDR3 comprising the amino acid sequence of SEQ ID NO:106, (qqq) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:108, a CDR2 comprising the amino acid sequence of SEQ ID NO:109, and a CDR3 comprising the amino acid sequence of SEQ ID NO:110, (rrr) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:112, a CDR2 comprising the amino acid sequence of SEQ ID NO:113, and a CDR3 comprising the amino acid sequence of SEQ ID NO:114, (sss) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID

NO:116, a CDR2 comprising the amino acid sequence of SEQ ID NO:117, and a CDR3 comprising the amino acid sequence of SEQ ID NO:118, (ttt) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:120, a CDR2 comprising the amino acid sequence of SEQ ID NO:121, and a CDR3 comprising the amino acid sequence of SEQ ID NO:122, (uuu) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:124, a CDR2 comprising the amino acid sequence of SEQ ID NO:125, and a CDR3 comprising the amino acid sequence of SEQ ID NO:126, (vvv) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:128, a CDR2 comprising the amino acid sequence of SEQ ID NO:129, and a CDR3 comprising the amino acid sequence of SEQ ID NO:130, (www) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:132, a CDR2 comprising the amino acid sequence of SEQ ID NO:133, and a CDR3 comprising the amino acid sequence of SEQ ID NO:134, (xxx) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:136, a CDR2 comprising the amino acid sequence of SEQ ID NO:137, and a CDR3 comprising the amino acid sequence of SEQ ID NO:138, (yyy) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:67, (zzz) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:68, (aaaa) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:69, (bbbb) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:70,(cccc) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:71, (dddd) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:72, (eeee) a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid

sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:73, (ffff) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:8, (gggg) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:67, (hhhh) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:92 or153, a CDR2 comprising the amino acid sequence of SEQ ID NO:93 or 154, and a CDR3 comprising the amino acid sequence of SEQ ID NO:94 or 155 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:96 or 156, a CDR2 comprising the amino acid sequence of SEQ ID NO:97 or 157, and a CDR3 comprising the amino acid sequence of SEQ ID NO:98 or 158, (iiii) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:100, a CDR2 comprising the amino acid sequence of SEQ ID NO:101, and a CDR3 comprising the amino acid sequence of SEQ ID NO:102 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:104, a CDR2 comprising the amino acid sequence of SEQ ID NO:105, and a CDR3 comprising the amino acid sequence of SEQ ID NO:106, (jjjj) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:108, a CDR2 comprising the amino acid sequence of SEQ ID NO:109, and a CDR3 comprising the amino acid sequence of SEQ ID NO:110 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:112, a CDR2 comprising the amino acid sequence of SEQ ID NO:113, and a CDR3 comprising the amino acid sequence of SEQ ID NO:114, (kkkk) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:116, a CDR2 comprising the amino acid sequence of SEQ ID NO:117, and a CDR3 comprising the amino acid sequence of SEQ ID NO:118 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:120, a CDR2 comprising the amino acid sequence of SEQ

ID NO:121, and a CDR3 comprising the amino acid sequence of SEQ ID NO:122, (llll) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:124, a CDR2 comprising the amino acid sequence of SEQ ID NO:125, and a CDR3 comprising the amino acid sequence of SEQ ID NO:126 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:128, a CDR2 comprising the amino acid sequence of SEQ ID NO:129, and a CDR3 comprising the amino acid sequence of SEQ ID NO:130, (mmmm) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:132, a CDR2 comprising the amino acid sequence of SEQ ID NO:133, and a CDR3 comprising the amino acid sequence of SEQ ID NO:134 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:136, a CDR2 comprising the amino acid sequence of SEQ ID NO:137, and a CDR3 comprising the amino acid sequence of SEQ ID NO:138, (nnnn) a variable heavy chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4 and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:68, (oooo) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:69, (pppp) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:70, (qqqq) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid

sequence of SEQ ID NO:71, (rrrr) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:72, (ssss) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:73, (tttt) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:10, a CDR2 comprising the amino acid sequence of SEQ ID NO:11, and a CDR3 comprising the amino acid sequence of SEQ ID NO:12, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:14, a CDR2 comprising the amino acid sequence of SEQ ID NO:15, and a CDR3 comprising the amino acid sequence of SEQ ID NO:16, (uuuu) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:18, a CDR2 comprising the amino acid sequence of SEQ ID NO:19, and a CDR3 comprising the amino acid sequence of SEQ ID NO:20, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:22, a CDR2 comprising the amino acid sequence of SEQ ID NO:23, and a CDR3 comprising the amino acid sequence of SEQ ID NO:24, (vvvv) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:26, a CDR2 comprising the amino acid sequence of SEQ ID NO:27, and a CDR3 comprising the amino acid sequence of SEQ ID NO:28, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:30, a CDR2 comprising the amino acid sequence of SEQ ID NO:31, and a CDR3 comprising the amino acid sequence of SEQ ID NO:32, (wwww) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:34, a CDR2 comprising the amino acid sequence of SEQ ID NO:35, and a CDR3 comprising the amino acid sequence of SEQ ID NO:36, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:38, a CDR2 comprising the amino acid sequence of SEQ ID NO:39, and a CDR3 comprising the amino acid sequence of SEQ ID NO:40, (xxxx) a variable heavy domain chain comprising a

CDR1 comprising the amino acid sequence of SEQ ID NO:42, a CDR2 comprising the amino acid sequence of SEQ ID NO:43, and a CDR comprising the amino acid sequence of SEQ ID NO:44, and a variable light domain chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:46, a CDR2 comprising the amino acid sequence of SEQ ID NO:47, and a CDR3 comprising the amino acid sequence of SEQ ID NO:48; (yyyy) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:50, a CDR2 comprising the amino acid sequence of SEQ ID NO:51, and a CDR3 comprising the amino acid sequence of SEQ ID NO:52, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:54, a CDR2 comprising the amino acid sequence of SEQ ID NO:55, and a CDR3 comprising the amino acid sequence of SEQ ID NO:56, (zzzz) a variable heavy chain comprising a CDR 1 comprising the amino acid sequence of SEQ ID NO:58, a CDR2 comprising the amino acid sequence of SEQ ID NO:59, and a CDR3 comprising the amino acid sequence of SEQ ID NO:60, and a variable light chain comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:62, a CDR2 comprising the amino acid sequence of SEQ ID NO:63, and a CDR3 comprising the amino acid sequence of SEQ ID NO:64.

2. The isolated antibody or antibody fragment of claim 1, wherein the antibody is selected from the group consisting of a human antibody, an immunoglobulin molecule, a disulfide linked Fv, a monoclonal antibody, an affinity matured, a scFv, a chimeric antibody, a single domain antibody, a CDR-grafted antibody, a diabody, a humanized antibody, a multispecific antibody, a Fab, a dual specific antibody, a DVD, a Fab', a bispecific antibody, a F(ab')2, and a Fv.

3. The isolated antibody or antibody fragment of claim 3, wherein the antibody or antibody fragment is human.

4. The isolated antibody or antibody fragment of claim 1, wherein the monoclonal antibody or antibody fragment comprises a heavy chain immunoglobulin constant domain selected from the group consisting of a human IgM constant domain, a human IgG4 constant domain, a human IgG1 constant domain, a human IgE constant domain, a human IgG2 constant domain, a human igG3 constant domain, and a human IgA constant domain.

5. The isolated antibody or antibody fragment of claim 4, wherein the human IgG1 constant domain comprises SEQ ID NO:140.

6. The isolated antibody or antibody fragment of claim 4, wherein the human IgG1 constant domain consists of SEQ ID NO:140.

7. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy region comprising a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:9, SEQ ID NO:17, SEQ ID NO:25, SEQ ID NO:33, SEQ ID NO:41, SEQ ID NO:49, SEQ ID NO:57, SEQ ID NO:91, SEQ ID NO:99, SEQ ID NO:107, SEQ ID NO:115, SEQ ID NO:123, and SEQ ID NO:131.

8. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable light region comprising a sequence selected from the group consisting of SEQ ID NO:5, SEQ ID NO:13, SEQ ID NO:21, SEQ ID NO:29, SEQ ID NO:37, SEQ ID NO:45, SEQ ID NO:53, SEQ ID NO:61, SEQ ID NO:95, SEQ ID NO:103, SEQ ID NO:111, SEQ ID NO:119, SEQ ID NO:127, and SEQ ID NO:135.

9. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:8, or SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:67, SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:68, or SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:69, or SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:70, or SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:71, or SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:72 or SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:73, or SEQ ID NO:14, SEQ ID NO:15, and SEQ ID NO:16, or SEQ ID NO:22, SEQ ID NO:23, and SEQ ID NO:24, or SEQ ID NO:30, SEQ ID NO:31, and SEQ ID NO:32, or SEQ ID NO:38, SEQ ID NO:39, and SEQ ID NO:40, or SEQ ID NO:54, SEQ ID NO:55, and SEQ ID NO:56, or SEQ ID NO:62, SEQ ID NO:63, and SEQ ID NO:64, or SEQ ID NO:46, SEQ ID NO:47, and SEQ ID NO:48, SEQ ID NO:96, SEQ ID NO:97, and SEQ ID NO:98, SEQ ID NO:104, SEQ ID NO:105, and SEQ ID NO:106, SEQ ID NO:112, SEQ ID NO:113, and SEQ ID NO:114, SEQ ID NO:120, SEQ ID NO:121, and SEQ ID NO:122, SEQ ID NO:128, SEQ ID NO:129, and SEQ ID NO:130, SEQ ID NO:136, SEQ ID NO:137, and SEQ ID NO:138, and SEQ ID NO: 156, and SEQ ID NO: 157, and SEQ ID NO: 158.

10. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:2, SEQ ID NO:3, and SEQ ID NO:4, or SEQ ID

NO:10, SEQ ID NO:11, and SEQ ID NO:12, or SEQ ID NO:18, SEQ ID NO:19, and SEQ ID NO:20, or SEQ ID NO:26, SEQ ID NO:27, and SEQ ID NO:28, or SEQ ID NO:34, SEQ ID NO:35, and SEQ ID NO:36, or SEQ ID NO:50, SEQ ID NO:51, and SEQ ID NO:52, or SEQ ID NO:58, SEQ ID NO:59, and SEQ ID NO:60, SEQ ID NO:42, SEQ ID NO:43, and SEQ ID NO:44, SEQ ID NO:92, SEQ ID NO:93, and SEQ ID NO:94, SEQ ID NO:100, SEQ ID NO:101, and SEQ ID NO:102, SEQ ID NO:108, SEQ ID NO:109, and SEQ ID NO:110, SEQ ID NO:116, SEQ ID NO:117, and SEQ ID NO:118, SEQ ID NO:124, SEQ ID NO:125, and SEQ ID NO:126, SEQ ID NO:132, SEQ ID NO:133, and SEQ ID NO:134, and SEQ ID NO: 153, and SEQ ID NO: 154, and SEQ ID NO: 155.

11. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:2, SEQ ID NO:3, and SEQ ID NO:4, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:8.

12. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:10, SEQ ID NO:11, and SEQ ID NO:12, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:14, SEQ ID NO:15, and SEQ ID NO:16.

13. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:18, SEQ ID NO:19, and SEQ ID NO:20, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:22, SEQ ID NO:23, and SEQ ID NO:24.

14. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:26, SEQ ID NO:27, and SEQ ID NO:28, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:30, SEQ ID NO:31, and SEQ ID NO:32.

15. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-

determining region (CDR) residues SEQ ID NO:34, SEQ ID NO:35, and SEQ ID NO:36, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:38, SEQ ID NO:39, and SEQ ID NO:40.

16. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:50, SEQ ID NO:51, and SEQ ID NO:52, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:54, SEQ ID NO:55, and SEQ ID NO:56.

17. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:58, SEQ ID NO:59, and SEQ ID NO:60, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:62, SEQ ID NO:63, and SEQ ID NO:64.

18. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:42, SEQ ID NO:43, and SEQ ID NO:44, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:46, SEQ ID NO:47, and SEQ ID NO:48.

19. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:92 or 153, SEQ ID NO:93 or 154, and SEQ ID NO:94 or 155, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:96 or 156, SEQ ID NO:97 or 157, and SEQ ID NO:98 or 158.

20. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:100, SEQ ID NO:101, and SEQ ID NO:102, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:104, SEQ ID NO:105, and SEQ ID NO:106.

21. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:108, SEQ ID NO:109, and SEQ ID NO:110,

and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:112, SEQ ID NO:113, and SEQ ID NO:114.

22. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:116, SEQ ID NO:117, and SEQ ID NO:118, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:120, SEQ ID NO:121, and SEQ ID NO:122.

23. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:124, SEQ ID NO:125, and SEQ ID NO:126, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:128, SEQ ID NO:129, and SEQ ID NO:130.

24. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises a variable heavy domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:132, SEQ ID NO:133, and SEQ ID NO:134, and a variable light domain that comprises complementarity-determining region (CDR) residues SEQ ID NO:136, SEQ ID NO:137, and SEQ ID NO:138.

25. The antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment further comprises an agent selected from the group consisting of: an immunoadhesion molecule, an imaging agent, and a therapeutic agent.

26. The antibody or antibody fragment of claim 25, wherein the imaging agent is selected from the group consisting of a radiolabel, an enzyme, a fluorescent label, a luminescent label, a bioluminescent label, a magnetic label, and biotin.

27. The antibody or antibody fragment of claim 26, wherein the radiolabel is selected from the group consisting of 3H, 14C, 35S, 90Y, 99Tc, 111In, 125I, 131I, 177Lu, 166Ho, and 153Sm.

28. A pharmaceutical composition comprising the antibody, antibody fragment, mixture or derivative thereof of claim 1.

29. Use of a therapeutically effective amount of the antibody of claim 1, in the manufacture of a medicament for treating, preventing, modulating, or attenuating a disease or disorder associated with neurite degeneration.

30. The use of claim 29, wherein the neurite degenerative disorder is selected from the group consisting of multiple sclerosis, Parkinson's disease, Alzheimer's disease, Tay-Sachs disease, Niemann-Pick disease, Gaucher's disease, Hurler's syndrome, Huntington's disease, amyotrophic lateral sclerosis, idiopathic inflammatory demyelinating diseases, vitamin B12 deficiency, central pontine myelinolysis, tabes dorsalis, transverse myelitis, Devic's disease, progressive multifocal leukoencephalopathy, optic neuritis, traumatic injury to the CNS, , an ischemic cerebral stroke, glaucoma, diabetic retinopathy, age-dependent macular degeneration, and a leukodystrophy.

31. A method for determining whether a subject has a neurite degenerative disorder, comprising

(a) measuring the level of RGMa in a sample from the subject; and

(b) comparing the level of RGMa in the sample with a normal control, wherein an altered level of RGMa indicates that the subject has a neurite degenerative disorder.

32. The method of claim 31, wherein an increased level of RGMa as compared to the normal control, indicates that the subject has neurite degenerative disorder.

33. The method of claim 31, wherein the sample is selected from the group consisting of a blood sample, a cerebrospinal fluid sample, and a serum sample.

34. The method of claim 31, wherein step (a) is an immunoassay.

35. The method of claim 35, wherein the immunoassay is an enzyme-linked immunosorbent assay (ELISA).

36. The method of claim 35, wherein the ELISA is a sandwich ELISA.

37. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises SEQ ID NOs:1-7 and 67.

38. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises SEQ ID NOs:1-7 and 68.

39. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises SEQ ID NOs:1-7 and 69.

40. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises SEQ ID NOs:1-7 and 70.

41. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises SEQ ID NOs:1-7 and 71.

42. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises SEQ ID NOs:1-7 and 72.

43. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment comprises SEQ ID NOs:1-7 and 73.

44. The isolated antibody of any one of claims 37-43, wherein the isolated antibody binds to the RGMa epitope PCKILKCNSEFWSATSGSHAPAS (hRGMa 47-69) (SEQ ID NO:79).

45. An isolated antibody or antibody fragment thereof which binds to Repulsive Guidance Molecule a ("RGMa"), wherein the antibody or antibody fragment comprises a variable heavy domain that comprises three complementarity-determining regions (CDR) corresponding to the following formulas, respectively:

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 (Formula 1 – CDR-H1), wherein Xaa1 is an amino acid selected from the group consisting of S, D, E, N, G, and T; Xaa2 is an amino acid selected from the group consisting of H, Y, L, S, and Q; Xaa3 is an amino acid selected from the group consisting of G, D, A, T, and Y; Xaa4 is an amino acid selected from the group consisting of I, M, and W; and Xaa5 is an amino acid sequence from the group consisting of S, N, H, A, T, and Q;

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – Xaa7 – Xaa8 – Xaa9 – Xaa10 – Xaa11 – Xaa12 – Xaa13 – Xaa14 – Xaa15 – Xaa16 – $(Xaa)_n$ (Formula 2 – CDR-H2), wherein n is 0 or 1, and wherein Xaa1 is an amino acid selected from the group consisting of Y, V, A, G, L, G, S, and N; Xaa2 is an amino acid selected from the group consisting of I, M, and F; Xaa3 is an amino acid selected from the group consisting of S, N, D, F, and Y; Xaa4 is an amino acid selected from the group consisting of P, Y, G, W, H, A, and S; Xaa5 is an amino acid selected from the group consisting of Y, N, D, E, S, K, G, and T; Xaa6 is an amino acid selected from the group consisting of S, G, D, T, and N; Xaa7 is an amino acid selected from the group consisting of G, S, I, E, N, and R; Xaa8 is an amino acid selected from the group consisting of N, L, R, S, T, and Y; Xaa9 is an amino acid selected from the group consisting of T, K, G, N, I, and Y; Xaa10 is an amino acid selected from the group consisting of N, G, Y, T, and K; Xaa11 is an amino acid selected from the group consisting of Y, F, N, and H; Xaa12 is an amino acid selected from the

group consisting of A, T, V, P, L, and S; Xaa13 is an amino acid selected from the group consisting of Q, D, P, and S; Xaa14 is an amino acid selected from the group consisting of K, S, N, and L; Xaa15 is an amino acid selected from the group consisting of L, F, V, K, and R; Xaa16 is an amino acid selected from the group consisting of Q, K, R, and S; and Xaa17 is a glycine; and

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – $(Xaa)_n$ (Formula 3 – CDR-H3), wherein n is 0 - 11, and

wherein Xaa1 is an amino acid selected from the group consisting of V, S, E, N, L, D, Q, and A; Xaa2 is an amino acid selected from the group consisting of G, T, R, Y, L, I, D, and S; Xaa3 is an amino acid selected from the group consisting of S, V, D, G, F, Y, P, M, C, L, and A; Xaa4 is an amino acid selected from the group consisting of G, L, Y, N, E, K, A, and F; Xaa5 is an amino acid selected from the group consisting of P, S, Y, A, V, G, T, E, and W; Xaa6 is an amino acid selected from the group consisting of Y, V, S, L, D, G, H, and P; Xaa7 is an amino acid selected from the group consisting of Tyr, Asp, Gly, Ser, Phe, Leu, and Cys; Xaa8 is an amino acid selected from the group consisting of Tyr, Lys, Asp, Ala, and Gln; Xaa9 is an amino acid selected from the group consisting of Met, Glu, Phe, Leu, Ser, Thr, Pro, and Tyr; Xaa10 is an amino acid selected from the group consisting of Asp, Gly, Tyr, Ser, Leu, His, and Phe; Xaa11 is an amino acid selected from the group consisting of Val, Tyr, Leu, His, Gly, Trp, and Asp; Xaa12 is an amino acid selected from the group consisting of Tyr and Phe; Xaa13 is an amino acid selected from the group consisting of Tyr, Gly, and Asp; Xaa14 is an amino acid selected from the group consisting of Ala, Leu, Pro, and Tyr; Xaa15 is an amino acid selected from the group consisting of Met, Leu, and Phe; Xaa16 is an amino acid selected from the group consisting of Asp and Gly; and Xaa17 is an amino acid selected from the group consisting of an Val, Asp, and Tyr.

46. An isolated antibody or antibody fragment thereof which binds to Repulsive Guidance Molecule a ("RGMa"), wherein the antibody or antibody fragment comprises a variable light domain that comprises three complementarity-determining regions (CDR) corresponding to the following formulas, respectively:

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – Xaa7 – Xaa8 – Xaa9 – Xaa10 – Xaa11 – $(Xaa)_n$ (Formula 1 –CDR-L1), wherein n is 0-3, and

wherein Xaa1 is an amino acid selected from the group consisting of T, S, R, G, and Q; Xaa2 is an amino acid selected from the group consisting of G, L, and A; Xaa3 is an amino acid selected from the group consisting of T, D, S, N and A; Xaa4 is an amino acid selected from the group consisting of S, K, G, Q, N, and E; Xaa5 is an amino acid sequence from the group consisting of S, L, G, I , D, and P; Xaa6 is an amino acid selected from the group consisting of S, G, N, H, and I; Xaa7 is an amino acid selected from the group consisting of V, D, I, S, G and H; Xaa8 is an amino acid selected from the group consisting of G, K, A, S, I, N, T, and D; Xaa9 is an amino acid selected from the group consisting of D, Y, A, C, S, and F; Xaa10 is an amino acid selected from the group consisting of S, A, G, L, V, and N; Xaa11 is an amino acid selected from the group consisting of I, C, Y, H, R, N, and S; Xaa12 is an amino acid selected from the group consisting of Tyr, Gly, Ala, and Val; Xaa13 is an amino acid selected from the group consisting of Val, and Asn; and Xaa14 is an amino acid selected from the group consisting of Ser and His;

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – Xaa7 – $(Xaa)_n$ (Formula 2 – CDR-L2), wherein n is 0-4, and wherein Xaa1 is an amino acid selected from the group consisting of D, Q, G, V, Y, S and E; Xaa2 is an amino acid selected from the group consisting of V, D, N, and A; Xaa3 is an amino acid selected from the group consisting of T, S, Y, N, and K; Xaa4 is an amino acid selected from the group consisting of K, N, D, Q and T; Xaa5 is an amino acid selected from the group consisting of R, G, S, and L; Xaa6 is an amino acid selected from the group consisting of P, S, I, and E; Xaa7 is an amino acid selected from the group consisting of S, H, I, and T; Xaa8 is Asn; Xaa9 is Lys; and Xaa10 is Gly; Xaa11 is Asp; and

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – Xaa7 – Xaa8 – Xaa9 – $(Xaa)_n$ (Formula 3 – CDR-L3), wherein n is 0-2, and

wherein Xaa1 is an amino acid selected from the group consisting of C, Q, H, F, H, L, V, I, K, Y, and A; Xaa2 is an amino acid selected from the group consisting of S, A, T, Q, and V; Xaa3 is an amino acid selected from the group consisting of Y, W, and S; Xaa4 is an amino acid selected from the group consisting of A, D, G, S, H and Y; Xaa5 is an amino acid selected from the group consisting of G, S, N, P, D, V, and T; Xaa6 is an amino acid selected from the group consisting

of I, T, S, G, L, F and Y; Xaa7 is an amino acid selected from the group consisting of D, T, L, I, P, and S; Xaa8 is an amino acid selected from the group consisting of T, G, R, Y, D, N, W, L, F and P; Xaa9 is an amino acid selected from the group consisting of L, V, G, T, and H; Xaa10 is an amino acid selected from the group consisting of Val, Tyr, and His; Xaa11 is Leu or Val.

47. An isolated antibody or antibody fragment thereof which binds to Repulsive Guidance Molecule a ("RGMa"), wherein the antibody or antibody fragment comprises a variable heavy domain that comprises three complementarity-determining regions (CDR-H1, H2, and H3) corresponding to the following formulas, respectively:

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 (Formula 1 – CDR-H1), wherein Xaa1 is an amino acid selected from the group consisting of S, D, E, N, G, and T; Xaa2 is an amino acid selected from the group consisting of H, Y, L, S, and Q; Xaa3 is an amino acid selected from the group consisting of G, D, A, T, and Y; Xaa4 is an amino acid selected from the group consisting of I, M, and W; and Xaa5 is an amino acid sequence from the group consisting of S, N, H, A, T, and Q;

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – Xaa7 – Xaa8 – Xaa9 – Xaa10 – Xaa11 – Xaa12 – Xaa13 – Xaa14 – Xaa15 – Xaa16 – $(Xaa)_n$ (Formula 2 – CDR-H2), wherein n is 0 or 1, and wherein Xaa1 is an amino acid selected from the group consisting of Y, V, A, G, L, G, S, and N; Xaa2 is an amino acid selected from the group consisting of I, M, and F; Xaa3 is an amino acid selected from the group consisting of S, N, D, F, and Y; Xaa4 is an amino acid selected from the group consisting of P, Y, G, W, H, A, and S; Xaa5 is an amino acid selected from the group consisting of Y, N, D, E, S, K, G, and T; Xaa6 is an amino acid selected from the group consisting of S, G, D, T, and N; Xaa7 is an amino acid selected from the group consisting of G, S, I, E, N, and R; Xaa8 is an amino acid selected from the group consisting of N, L, R, S, T, and Y; Xaa9 is an amino acid selected from the group consisting of T, K, G, N, I, and Y; Xaa10 is an amino acid selected from the group consisting of N, G, Y, T, and K; Xaa11 is an amino acid selected from the group consisting of Y, F, N, and H; Xaa12 is an amino acid selected from the group consisting of A, T, V, P, L, and S; Xaa13 is an amino acid selected from the group consisting of Q, D, P, and S; Xaa14 is an amino acid selected from the group consisting of K, S, N, and L; Xaa15 is an amino acid selected from the group consisting of L, F, V, K, and R; Xaa16

is an amino acid selected from the group consisting of Q, K, R, and S; and Xaa17 is a glycine; and

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – $(Xaa)_n$ (Formula 3 – CDR-H3), wherein n is 0 - 11, and

wherein Xaa1 is an amino acid selected from the group consisting of V, S, E, N, L, D, Q, and A; Xaa2 is an amino acid selected from the group consisting of G, T, R, Y, L, I, D, and S; Xaa3 is an amino acid selected from the group consisting of S, V, D, G, F, Y, P, M, C, L, and A; Xaa4 is an amino acid selected from the group consisting of G, L, Y, N, E, K, A, and F; Xaa5 is an amino acid selected from the group consisting of P, S, Y, A, V, G, T, E, and W; Xaa6 is an amino acid selected from the group consisting of Y, V, S, L, D, G, H, and P; Xaa7 is an amino acid selected from the group consisting of Tyr, Asp, Gly, Ser, Phe, Leu, and Cys; Xaa8 is an amino acid selected from the group consisting of Tyr, Lys, Asp, Ala, and Gln; Xaa9 is an amino acid selected from the group consisting of Met, Glu, Phe, Leu, Ser, Thr, Pro, and Tyr; Xaa10 is an amino acid selected from the group consisting of Asp, Gly, Tyr, Ser, Leu, His, and Phe; Xaa11 is an amino acid selected from the group consisting of Val, Tyr, Leu, His, Gly, Trp, and Asp; Xaa12 is an amino acid selected from the group consisting of Tyr and Phe; Xaa13 is an amino acid selected from the group consisting of Tyr, Gly, and Asp; Xaa14 is an amino acid selected from the group consisting of Ala, Leu, Pro, and Tyr; Xaa15 is an amino acid selected from the group consisting of Met, Leu, and Phe; Xaa16 is an amino acid selected from the group consisting of Asp and Gly; and Xaa17 is an amino acid selected from the group consisting of an Val, Asp, and Tyr; and

wherein the antibody or antibody fragment also comprises a variable light domain that comprises three complementarity-determining regions (CDR-L1, L2, and L3) corresponding to the following formulas, respectively:

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – Xaa7 – Xaa8 – Xaa9 – Xaa10 – Xaa11 – $(Xaa)_n$ (Formula 1 –CDR-L1), wherein n is 0-3, and

wherein Xaa1 is an amino acid selected from the group consisting of T, S, R, G, and Q; Xaa2 is an amino acid selected from the group consisting of G, L, and A; Xaa3 is an amino acid selected from the group consisting of T, D, S, N and A; Xaa4 is an amino acid selected from the group

consisting of S, K, G, Q, N, and E; Xaa5 is an amino acid sequence from the group consisting of S, L, G, I , D, and P; Xaa6 is an amino acid selected from the group consisting of S, G, N, H, and I; Xaa7 is an amino acid selected from the group consisting of V, D, I, S, G and H; Xaa8 is an amino acid selected from the group consisting of G, K, A, S, I, N, T, and D; Xaa9 is an amino acid selected from the group consisting of D, Y, A, C, S, and F; Xaa10 is an amino acid selected from the group consisting of S, A, G, L, V, and N; Xaa11 is an amino acid selected from the group consisting of I, C, Y, H, R, N, and S; Xaa12 is an amino acid selected from the group consisting of Tyr, Gly, Ala, and Val; Xaa13 is an amino acid selected from the group consisting of Val, and Asn; and Xaa14 is an amino acid selected from the group consisting of Ser and His;

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – Xaa7 – $(Xaa)_n$ (Formula 2 – CDR-L2), wherein n is 0-4, and wherein Xaa1 is an amino acid selected from the group consisting of D, Q, G, V, Y, S and E; Xaa2 is an amino acid selected from the group consisting of V, D, N, and A; Xaa3 is an amino acid selected from the group consisting of T, S, Y, N, and K; Xaa4 is an amino acid selected from the group consisting of K, N, D, Q and T; Xaa5 is an amino acid selected from the group consisting of R, G, S, and L; Xaa6 is an amino acid selected from the group consisting of P, S, I, and E; Xaa7 is an amino acid selected from the group consisting of S, H, I, and T; Xaa8 is Asn; Xaa9 is Lys; and Xaa10 is Gly; Xaa11 is Asp; and

Xaa1 – Xaa2 – Xaa3 – Xaa4 – Xaa5 – Xaa6 – Xaa7 – Xaa8 – Xaa9 – $(Xaa)_n$ (Formula 3 – CDR-L3), wherein n is 0-2, and
wherein Xaa1 is an amino acid selected from the group consisting of C, Q, H, F, H, L, V, I, K, Y, and A; Xaa2 is an amino acid selected from the group consisting of S, A, T, Q, and V; Xaa3 is an amino acid selected from the group consisting of Y, W, and S; Xaa4 is an amino acid selected from the group consisting of A, D, G, S, H and Y; Xaa5 is an amino acid selected from the group consisting of G, S, N, P, D, V, and T; Xaa6 is an amino acid selected from the group consisting of I, T, S, G, L, F and Y; Xaa7 is an amino acid selected from the group consisting of D, T, L, I, P, and S; Xaa8 is an amino acid selected from the group consisting of T, G, R, Y, D, N, W, L, F and P; Xaa9 is an amino acid selected from the group consisting of L, V, G, T, and H; Xaa10 is an amino acid selected from the group consisting of Val, Tyr, and His; Xaa11 is Leu or Val.

Claims

1. An isolated antibody or antibody fragment thereof which binds to Repulsive Guidance Molecule a ("RGMa"), wherein the antibody or antibody fragment comprises a heavy chain variable region comprising a complementarity determining region (CDR)1 comprising the amino acid sequence of SEQ ID NO:2, a CDR2 comprising the amino acid sequence of SEQ ID NO:3, and a CDR3 comprising the amino acid sequence of SEQ ID NO:4, and a light chain variable region comprising a CDR1 comprising the amino acid sequence of SEQ ID NO:6, a CDR2 comprising the amino acid sequence of SEQ ID NO:7, and a CDR3 comprising the amino acid sequence of SEQ ID NO:73.

2. The isolated antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment is selected from the group consisting of a human antibody, an immunoglobulin molecule, a disulfide linked Fv, a monoclonal antibody, an affinity matured antibody, a scFv, a chimeric antibody, a single domain antibody, a CDR-grafted antibody, a diabody, a humanized antibody, a multispecific antibody, a Fab, a dual specific antibody, a DVD, a Fab', a bispecific antibody, a F(ab')2, and a Fv.

3. The isolated antibody or antibody fragment of claim 1 or claim 2, wherein the antibody or antibody fragment is human.

4. The isolated antibody or antibody fragment of any one of claims 1-3, wherein the antibody or antibody fragment comprises a heavy chain immunoglobulin constant domain selected from the group consisting of a human IgM constant domain, a human IgG4 constant domain, a human IgG1 constant domain, a human IgE constant domain, a human IgG2 constant domain, a human igG3 constant domain, and a human IgA constant domain.

5. The isolated antibody or antibody fragment of claim 4, wherein the human IgG1 constant domain comprises the amino acid sequence of SEQ ID NO: 140, 141, 142, or 143.

6. The isolated antibody or antibody fragment of claim 4, wherein the human IgG1 constant domain comprises the amino acid sequence of SEQ ID NO: 143.

7. The isolated antibody or antibody fragment of claim 6, wherein the antibody or antibody fragment comprises a light chain amino acid sequence as set forth in SEQ ID NO: 146 and a variable heavy chain amino acid sequence as set forth in SEQ ID NO: 147.

8. The antibody or antibody fragment of any one of claims 1-7, wherein the antibody or antibody fragment further comprises an agent selected from the group consisting of: an immunoadhesion molecule, an imaging agent, and a therapeutic agent, wherein

(a) the imaging agent is selected from the group consisting of a radiolabel, an enzyme, a fluorescent label, a luminescent label, a bioluminescent label, a magnetic label, and biotin, and

(b) the radiolabel is selected from the group consisting of 3H, 14C, 35S, 90Y, 99Tc, 111In, 125I, 131I, 177Lu, 166Ho, and 153Sm.

9. A pharmaceutical composition comprising the antibody, antibody fragment, mixture or derivative thereof of any one of claims 1-8.

10. Use of the antibody or antibody fragment of any one of claims 1-8 in the manufacture of a medicament for the treatment, prevention, modulation, or attenuation of a disease or disorder associated with neurite degeneration.

11. The use of claim 10, wherein the disease or disorder associated with neurite degeneration is selected from the group consisting of multiple sclerosis, Parkinson's disease, Alzheimer's disease, Tay-Sachs disease, Niemann-Pick disease, Gaucher's disease, Hurler's syndrome, Huntington's disease, amyotrophic lateral sclerosis, idiopathic inflammatory demyelinating diseases, vitamin B12 deficiency, central pontine myelinolysis, tabes dorsalis, transverse myelitis, Devic's disease, progressive multifocal leukoencephalopathy, optic neuritis, traumatic injury to the CNS, , an ischemic cerebral stroke, glaucoma, diabetic retinopathy, age-dependent macular degeneration, and a leukodystrophy.

12. A method for determining whether a subject has a neurite degenerative disorder, comprising

(a) measuring the level of RGMa in a sample isolated from the subject, wherein the level of RGMa in the sample is determined using the antibody or antibody fragment of any one of claims 1-8; and

(b) comparing the level of RGMa in the sample with a normal control,

wherein an altered level of RGMa indicates that the subject has a neurite degenerative disorder.

13. The method of claim 12, wherein an increased level of RGMa as compared to the normal control indicates that the subject has neurite degenerative disorder.

14. The method of claim 12 or claim 13, wherein the sample is selected from the group consisting of a blood sample, a cerebrospinal fluid sample, and a serum sample.

15. The method of any one of claims 12-14, wherein step (a) is an immunoassay.