CLAIMS

What is claimed:

1. An antibody or antigen binding fragment thereof that binds ACVR2B, wherein the affinity of the antibody or antigen binding fragment to ACVR2B is greater than to ACVR2A, and wherein the antibody or antigen binding fragment comprises:

(i) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 25, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 26;

(ii) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 1, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 2;

(iii) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 3, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 4;

(iv) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 5, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 6;

(v) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 7, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 8;

(vi) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 9, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 10;

(vii) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 11, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 12;

(viii) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 13, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 14;

(ix) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 15, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 16;

(x) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino

acid sequence of SEQ ID NO: 17, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 18;

(xi) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 19, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 20;

(xii) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 21, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 22;

(xiii) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 23, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 24;

(xiv) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 27, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 28;

(xv) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 29, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 30;

(xvi) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 31, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 32; or

(xvii) a HCDR1, a HCDR2, and a HCDR3 as set forth in a VH comprising the amino acid sequence of SEQ ID NO: 33, and a LCDR1, a LCDR2, and a LCDR3 as set forth in a VL comprising the amino acid sequence of SEQ ID NO: 34.

2. The antibody or antigen binding fragment of claim 1, wherein

(i) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 107, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 108, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 109, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 110, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 111, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 112;

(ii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 35, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 36, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 37, the LCDR1 comprises the amino

acid sequence of SEQ ID NO: 38, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 39, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 40;

(iii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 41, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 42, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 43, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 44, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 45, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 46;

(iv) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 47, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 48, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 49, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 50, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 51, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 52;

(v) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 53, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 54, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 55, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 56, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 57, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 58;

(vi) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 59, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 60, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 61, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 62, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 63, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 64;

(vii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 65, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 66, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 67, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 68, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 69, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 70;

(viii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 71, the HCDR2

comprises the amino acid sequence of SEQ ID NO: 72, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 73, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 74, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 75, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 76;

(ix) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 77, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 78, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 79, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 80, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 81, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 82;

(x) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 83, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 84, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 85, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 86, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 87, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 88;

(xi) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 89, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 90, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 91, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 92, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 93, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 94;

(xii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 95, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 96, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 97, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 98, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 99, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 100;

(xiii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 101, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 102, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 103, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 104, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 105, and the LCDR3 comprises the amino acid

sequence of SEQ ID NO: 106;

(xiv) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 113, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 114, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 115, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 116, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 117, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 118;

(xv) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 119, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 120, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 121, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 122, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 123, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 124;

(xvi) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 125, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 126, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 127, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 128, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 129, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 130; or

(xvii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 131, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 132, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 133, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 134, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 135, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 136.

3. The antibody or antigen binding fragment of claim 1, wherein

(i) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 209, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 210, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 211, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 212, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 213, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 214;

(ii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 137, the

HCDR2 comprises the amino acid sequence of SEQ ID NO: 138, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 139, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 140, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 141, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 142;

(iii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 143, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 144, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 145, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 146, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 147, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 148;

(iv) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 149, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 150, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 151, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 152, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 153, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 154;

(v) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 155, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 156, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 157, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 158, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 159, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 160;

(vi) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 161, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 162, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 163, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 164, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 165, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 166;

(vii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 167, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 168, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 169, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 170, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 171, and the LCDR3 comprises the amino acid

sequence of SEQ ID NO: 172;

(viii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 173, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 174, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 175, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 176, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 177, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 178;

(ix) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 179, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 180, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 181, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 182, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 183, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 184;

(x) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 185, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 186, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 187, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 188, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 189, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 190;

(xi) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 191, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 192, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 193, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 194, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 195, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 196;

(xii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 197, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 198, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 199, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 200, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 201, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 202;

(xiii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 203, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 204, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 205, the LCDR1 comprises

the amino acid sequence of SEQ ID NO: 206, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 207, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 208;

(xiv) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 215, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 216, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 217, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 218, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 219, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 220;

(xv) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 221, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 222, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 223, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 224, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 225, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 226;

(xvi) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 227, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 228, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 229, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 230, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 231, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 232;

(xvii) the HCDR1 comprises the amino acid sequence of SEQ ID NO: 233, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 234, the HCDR3 comprises the amino acid sequence of SEQ ID NO: 235, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 236, the LCDR2 comprises the amino acid sequence of SEQ ID NO: 237, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 238.

4. The antibody or antigen binding fragment of any one of claims 1-3, wherein the antibody or antigen binding fragment comprises:

(i) a VH comprising the amino acid sequence of SEQ ID NO: 25, and a VL comprising the amino acid sequence of SEQ ID NO: 26;

(ii) a VH comprising the amino acid sequence of SEQ ID NO: 1, and a VL comprising the amino acid sequence of SEQ ID NO: 2;

(iii) a VH comprising the amino acid sequence of SEQ ID NO: 3, and a VL comprising the amino acid sequence of SEQ ID NO: 4;

(iv) a VH comprising the amino acid sequence of SEQ ID NO: 5, and a VL comprising the amino acid sequence of SEQ ID NO: 6;

(v) a VH comprising the amino acid sequence of SEQ ID NO: 7, and a VL comprising the amino acid sequence of SEQ ID NO: 8;

(vi) a VH comprising the amino acid sequence of SEQ ID NO: 9, and a VL comprising the amino acid sequence of SEQ ID NO: 10;

(vii) a VH comprising the amino acid sequence of SEQ ID NO: 11, and a VL comprising the amino acid sequence of SEQ ID NO: 12;

(viii) a VH comprising the amino acid sequence of SEQ ID NO: 13, and a VL comprising the amino acid sequence of SEQ ID NO: 14;

(ix) a VH comprising the amino acid sequence of SEQ ID NO: 15, and a VL comprising the amino acid sequence of SEQ ID NO: 16;

(x) a VH comprising the amino acid sequence of SEQ ID NO: 17, and a VL comprising the amino acid sequence of SEQ ID NO: 18;

(xi) a VH comprising the amino acid sequence of SEQ ID NO: 19, and a VL comprising the amino acid sequence of SEQ ID NO: 20;

(xii) a VH comprising the amino acid sequence of SEQ ID NO: 21, and a VL comprising the amino acid sequence of SEQ ID NO: 22;

(xiii) a VH comprising the amino acid sequence of SEQ ID NO: 23, and a VL comprising the amino acid sequence of SEQ ID NO: 24;

(xiv) a VH comprising the amino acid sequence of SEQ ID NO: 27, and a VL comprising the amino acid sequence of SEQ ID NO: 28;

(xv) a VH comprising the amino acid sequence of SEQ ID NO: 29, and a VL comprising the amino acid sequence of SEQ ID NO: 30;

(xvi) a VH comprising the amino acid sequence of SEQ ID NO: 31, and a VL comprising the amino acid sequence of SEQ ID NO: 32; or

(xvii) a VH comprising the amino acid sequence of SEQ ID NO: 33, and a VL comprising the amino acid sequence of SEQ ID NO: 34.

5. The antibody or antigen binding fragment of any one of claims 1-4, wherein the antibody or antigen binding fragment is an IgG; optionally wherein the antibody or

antigen binding fragment is a human antibody.

6. The antibody or antigen binding fragment of any one of claims 1 -5, wherein the antibody or antigen binding fragment comprises one or more mutations in the Fc region to reduce or eliminate the antibody-dependent cell-mediated cytotoxicity (ADCC) and/or complement dependent cytotoxicity (CDC) effect; optionally wherein the antibody or antigen binding fragment comprises:

(1) one or two mutations of L239A and L240A; or

(2) one or two mutations of L234A and L235A.

7. The antibody or antigen binding fragment of any one of claims 1-6, wherein the antibody or antigen binding fragment thereof is genetically fused or chemically conjugated to an agent.

8. A nucleic acid molecule encoding the antibody or antigen binding fragment of any one of claims 1-7.

9. A vector comprising the nucleic acid molecule of claim 8.

10. A host cell transformed with the vector of claim 9.

11. A composition comprising a therapeutically effective amount of the antibody or antigen binding fragment of any one of claims 1-7, the nucleic acid molecule of claim 8, or the vector of claim 9, and a pharmaceutically acceptable excipient.

12. Use of the composition of claim 11 in the manufacture of a medicament for treating a disease or disorder in a subject,
wherein the disease or disorder is associated with ACVR2B; or
wherein the disease or disorder is associated with ACVR2B ligands; or
wherein the disease or disorder is associated with Activin A, Activin B, Activin AB, GDF8 or GDF11; or
wherein the disease or disorder is a musculoskeletal disease or disorder; optionally
wherein the musculoskeletal disease or disorder is selected from a group consisting of muscle atrophy, spinal muscular atrophy and cancer cachexia; or

wherein the disease or disorder is an age-related condition selected from a group consisting of sarcopenia, skin atrophy, muscle wasting, brain atrophy, atherosclerosis, arteriosclerosis, pulmonary emphysema, osteoporosis, osteoarthritis, immunologic incompetence, high blood pressure, dementia, Huntington's disease, Alzheimer's disease, cataracts, age-related macular degeneration, prostate cancer, stroke, diminished life expectancy, frailty, memory loss, wrinkles, impaired kidney function, and age-related hearing loss; or
wherein the disease or disorder is a metabolic disorder selected from a group consisting of Type II Diabetes, Metabolic Syndrome, hyperglycemia, NASH and obesity; or
wherein the disease or disorder is selected from a group consisting of acute and/or chronic renal disease or failure, liver fibrosis or cirrhosis, lung fibrosis, pulmonary hypertension (PH), pulmonary arterial hypertension (PAH), kidney fibrosis, Parkinson's Disease, ALS, brain atrophy, dementia cachexia, boneloss inducing cancers; or
wherein the disease or disorder is cancer selected from a group consisting of rhabdomyosarcomas, ovarian cancers, breast cancer, esophageal cancer, head and neck cancer, lung cancer, melanoma, multiple myeloma, colorectal cancer, hepatocellular carcinomas, pancreatic cancer, endometrial cancer and gastrointestinal cancers; or
wherein the disease or disorder is anemia;
and optionally wherein the use further comprises a second agent to be administered.

13. The use of claim 12 wherein the second agent is an ACVR2A antagonist, wherein optionally the ACVR2A antagonist is an ACVR2A antibody.

14. An in vitro method for inhibiting or antagonizing ACVR2B activity in a cell, comprising contacting the cell with the composition of claim 11.

15. An in vitro method for inhibiting or blocking the binding of an ACVR2B ligand to ACVR2B expressed on a cell or an ACVR2B ligand induced signaling through AC VR2B in a cell, comprising contacting the cell with the composition of claim 11, wherein optionally the ACVR2B ligand is Activin A, Activin B, Activin AB, GDF8 or GDF11.