What Is Claimed Is:

1. A variant antigen binding molecule (ABM) which binds membrane bound human carcinoembryonic antigen (CEA), wherein the ABM is stable at a temperature that is at least 0.5, 1.0, 1.5, or 2.0 degree Celcius higher than PR1A3 antibody or a humanized version of PR1A3 antibody.

2. The ABM of claim 1, wherein the increase in stability is measured using a dynamic light scattering assay.

3. The ABM of claim 1 or 2, wherein the PR1A3 antibody or humanized version of PR1A3 antibody is a humanized version of PR1A3 antibody which comprises the heavy chain variable region CH7A (SEQ ID NO:101) and the light chain variable region 2F1 (SEQ ID NO: 209).

4. The ABM of any of claims 1-3, wherein the ABM comprises a heavy chain variable region comprising:

a heavy chain CDR1 selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, and SEQ ID NO:12,

a heavy chain CDR2 selected from the group consisting of SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, and SEQ ID NO:24, and

heavy chain CDR3 selected from the group consisting of SEQ ID NO:217, SEQ ID NO:218, SEQ ID NO:219 SEQ ID NO:220, SEQ ID NO:221, SEQ ID NO:222, SEQ ID NO:223, and SEQ ID NO:224.

5. The ABM of claim 4, wherein the ABM comprises a light chain variable region comprising:

a light chain CDR1 selected from the group consisting of SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:40, SEQ ID NO:41, SEQ ID NO:42, SEQ ID NO:43, SEQ ID NO:44, and SEQ ID NO:45, and

a light chain CDR2 selected from the group consisting of SEQ ID NO:46, and SEQ ID NO:47, SEQ ID NO:48, SEQ ID NO:49, SEQ ID NO:50, SEQ ID NO:51, SEQ ID NO:52, SEQ ID NO:53, SEQ ID NO:54, and SEQ ID NO:55, and

a light chain CDR3 of SEQ ID NO:56.

6. The ABM of claim 5, wherein the heavy chain variable region comprises:

the heavy chain CDR1 of SEQ ID NO:1,

the heavy chain CDR2 of SEQ ID NO:13,

a heavy chain CDR3 selected from the group consisting SEQ ID NO:217, SEQ ID NO:218, SEQ ID NO:219 SEQ ID NO:220, SEQ ID NO:221, SEQ ID NO:222, SEQ ID NO:223, and SEQ ID NO:224; and

wherein the light chain variable region comprises:

the light chain CDR1 of SEQ ID NO:39,

the light chain CDR2 of SEQ ID NO:49, and

the light chain CDR3 of SEQ ID NO:56.

7. The ABM of any of claims 4-6, wherein the ABM comprises the framework residues of CH1A1A (SEQ ID NO: 261) or CH1A1B (SEQ ID NO: 262).

8. The ABM of claim 7, wherein the heavy chain variable region comprises an amino acid sequence that is at least 95% identical to a sequence selected from the group consisting of SEQ ID NO: 234, SEQ ID NO: 235, SEQ ID NO: 239, SEQ ID NO: 241, SEQ ID NO: 242, and SEQ ID NO: 247 and wherein the light chain variable region comprises an amino acid sequence that is at least 95% identical to the sequence of SEQ ID NO: 209.

9. A variant antigen binding molecule (ABM) which binds membrane bound human carcinoembryonic antigen (CEA), wherein the heavy chain variable region comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 233, SEQ ID NO: 234, SEQ ID NO: 235, SEQ ID NO: 239, SEQ ID NO: 241, SEQ ID NO: 242, SEQ ID NO: 243, and SEQ ID NO: 247 and wherein the light chain variable region comprises the amino acid sequence of SEQ ID NO: 209.

10. The ABM of any one of claims 1-9, wherein the ABM comprises an Fc region.

11. The ABM of any of claims 1-10, wherein the ABM or is an antibody or fragment thereof selected from the group consisting of: a whole antibody, an scFv fragment, an Fv fragment, an F(ab')2 fragment, a minibody, a diabody, a triabody, and a tetrabody.

12. The ABM of any of claims 1-11, wherein the ABM binds the same epitope as, or is capable of competing for binding with, the murine monoclonal antibody PR1A3.

13. The ABM of any of claims 1-12, wherein the ABM binds to membrane bound CEA with a Kd of 100 nM, 10 nM, 1 nM or lower.

14. An isolated antibody which binds membrane bound CEA, wherein the antibody comprises a heavy chain variable region comprising:

a heavy chain CDR1 selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, and SEQ ID NO:12,

~~a heavy chain CDR2 selected from the group consisting of SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, and SEQ ID NO:24, and~~

~~a heavy chain CDR3 selected from the group consisting of SEQ ID NO:217, SEQ ID NO:218, SEQ ID NO:219 SEQ ID NO:220, SEQ ID NO:221, SEQ ID NO:222, SEQ ID NO:223, and SEQ ID NO:224,~~

~~wherein the antibody is stable at a temperature that is at least 0.5, 1.0, 1.5, or 2.0 degree Celcius higher than PR1A3 antibody or humanized version of PR1A3 antibody.~~

~~15. The antibody of claim 14, wherein the increase in stability is measured using a dynamic light scattering assay.~~

~~16. The antibody of claim 14 or 15, wherein the PR1A3 antibody or humanized version of PR1A3 antibod is a humanized version of PR1A3 antibody which comprises the heavy chain variable region CH7A (SEQ ID NO:101) and the light chain variable region 2F1 (SEQ ID NO: 209).~~

~~17. The antibody of any of claims 14-16, wherein antibody comprises a light chain variable region comprising:~~

~~a light chain CDR1 selected from the group consisting of SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:40, SEQ ID NO:41, SEQ ID NO:42, SEQ ID NO:43, SEQ ID NO:44, and SEQ ID NO:45, and~~

~~a light chain CDR2 selected from the group consisting of SEQ ID NO:46, and SEQ ID NO:47, SEQ ID NO:48, SEQ ID NO:49, SEQ ID NO:50, SEQ ID NO:51, SEQ ID NO:52, SEQ ID NO:53, SEQ ID NO:54, and SEQ ID NO:55, and~~

~~a light chain CDR3 of SEQ ID NO:56.~~

What Is Claimed Is:

~~18~~1. ~~The~~ An isolated antibody ~~of claim 17~~which binds to membrane-bound carcinoembryonic antigen (CEA), wherein the antibody comprises a heavy chain variable region ~~comprises~~comprising:

the heavy chain CDR1 of SEQ ID NO:1 ,

the heavy chain CDR2 of SEQ ID NO:13,

a heavy chain CDR3 selected from the group consisting of SEQ ID NO:217, SEQ ID NO:218, SEQ ID NO:219 SEQ ID NO:220, SEQ ID NO:221, SEQ ID NO:222, and SEQ ID NO:223~~, and SEQ ID NO:224~~; and

~~wherein the~~a light chain variable region ~~comprises~~comprising:

the light chain CDR1 of SEQ ID NO:39,

the light chain CDR2 of SEQ ID NO:49, and

the light chain CDR3 of SEQ ID NO:56.

~~19~~2. The antibody of ~~any one of~~ claims ~~14-18~~1, wherein the antibody comprises the framework residues of CH1A1A (SEQ ID NO: 261) or CH1A1B (SEQ ID NO: 262).

~~20~~3. The antibody of ~~any of~~ claims ~~14-19~~1 or 2, wherein the heavy chain variable region comprises an amino acid sequence that is at least 95% identical to a sequence selected from the group consisting of SEQ ID NO: 233, SEQ ID NO: 234, SEQ ID NO: 235, SEQ ID NO: 239, SEQ ID NO: 241, SEQ ID NO: 242, SEQ ID NO: 243, and SEQ ID NO: 247 and wherein the light chain variable region comprises an amino acid sequence that is at least 95% identical to the sequence of SEQ ID NO: 209.

4. The antibody of any one of claims 1-3, wherein the antibody comprises a heavy chain variable region comprising the heavy chain CDR1 of SEQ ID NO: 1, the heavy chain CDR2 of SEQ ID NO: 13, the heavy chain CDR3 of SEQ ID NO: 233; and a light chain variable region comprising the light chain CDR1 of SEQ ID NO: 39, the light chain CDR2 of SEQ ID NO: 49, and the light chain CDR 3 of SEQ ID NO: 56.

~~21~~5. The antibody of any one of claims ~~14~~1-~~20~~4, wherein the antibody embodiments binds the same epitope as, or is capable of competing for binding with, the murine monoclonal antibody PR1A3.

~~22~~6. The antibody of any one of claims ~~14~~1-~~21~~5, wherein the ~~ABM~~ antibody binds to membrane-bound CEA with a Kd of 100 nM, 10 nM, 1 nM or lower.

~~23~~7. An antibody which binds membrane-bound human carcinoembryonic antigen (CEA), wherein the heavy chain variable region comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 233, SEQ ID NO: 234, SEQ ID NO: 235, SEQ ID NO: 239, SEQ ID NO: 241, SEQ ID NO: 242, SEQ ID NO: 243, and SEQ ID NO: 247 and wherein the light chain variable region comprises the amino acid sequence of SEQ ID NO: 209.

8. The antibody of claim 7, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO: 239 or SEQ ID NO: 247 and the light chain variable region comprises the amino acid sequence of SEQ ID NO: 209.

~~24~~9. The ~~ABM of any of claims 1-13 or the~~ antibody of any one of claims ~~14~~1-~~23~~8, wherein the ~~ABM or~~ antibody comprises an Fc region that has been glycoengineered.

~~25~~10. The ~~ABM or~~ antibody of claim ~~24~~9, wherein at least ~~about~~ 20% to ~~about~~ 100% of the N-linked oligosaccharides in the Fc region are nonfucosylated.

~~26~~11. The ~~ABM or~~ antibody of claim ~~24~~9, wherein at least ~~about~~ 20% to ~~about~~ 100% of the N-linked oligosaccharides in the Fc region are bisected.

~~27~~12. The ~~ABM or~~ antibody of claim ~~24~~9, wherein at least ~~about~~ 20% to ~~about~~ 50% of the N-linked oligosaccharides in the Fc region are bisected, nonfucosylated.

~~28~~13. The ~~ABM or~~ antibody of any of claims ~~24~~9-~~27~~12, wherein the ~~ABM or~~ antibody has at least one increased effector function.

~~29~~14. The ~~ABM or~~ antibody of claim ~~28~~13, wherein the at least one increased effector function is selected from the group consisting of: increased Fc receptor binding affinity, increased antibody-mediated cellular cytotoxicity (ADCC), increased binding to NK cells, increased binding to macrophages, increased binding to monocytes, increased binding to polymorphonuclear cells, direct signaling inducing apoptosis, increased dendritic cell maturation, and increased T cell priming.

~~30~~15. The ABM or antibody of claim ~~29~~14, wherein the ~~ABM or~~ antibody has an increase in ADCC of at least about 40% to about 100% as compared to the non-glycoengineered parent ~~antigen binding molecule~~antibody.

~~31~~16. An isolated polynucleotide encoding the ~~ABM or~~ antibody of any one of claims 1-~~30~~15.

~~32~~17. A vector comprising the polynucleotide of claim ~~31~~16.

~~33~~18. A host cell comprising the vector of claim ~~32~~17.

~~34~~19. A composition comprising the ~~ABM or~~ antibody of any one of claims 1-~~30~~ 15 and a pharmaceutically acceptable carrier.

~~35~~20. An *in vitro* method of inducing cell lysis of a tumor cell, the method comprising contacting the tumor cell with the ~~ABM or~~ antibody of any of claims 1-~~30~~ 15 or the composition of claim ~~34~~19.

~~36~~21. The *in vitro* method of claim ~~35~~20, wherein the tumor cell is selected from the group consisting of a colorectal cancer cell, NSCLC (non-small cell lung cancer), gastric cancer cell, pancreatic cancer cell and breast cancer cell.

~~37~~22. The *in vitro* method of claim ~~35~~20, wherein the cell lysis is induced by antibody dependent cell cytotoxicity of the ~~ABM or~~ antibody.

~~38~~23. The ~~ABM or~~ antibody of any one of claims 1-~~30~~ 15 or the composition of claim ~~34~~ 19 for use in treating a subject having a cancer that abnormally expresses CEA.

~~39~~24. The ~~ABM or~~ antibody of any one of claims 1-~~30~~ 15 or the composition of claim ~~34~~ 19 for use in increasing survival time in a subject having a cancer that abnormally expresses CEA.

~~40~~25. The ~~ABM,~~ antibody or composition of claim ~~38~~ 23 or ~~39~~24, wherein the cancer is selected from the group consisting of colorectal cancer, non-small cell lung cancer (NSCLC), gastric cancer, pancreatic cancer and breast cancer.

~~41~~26. The ~~ABM,~~ antibody or composition of any of claims ~~35~~23-~~40~~25, wherein the ABM or antibody or composition is for administration in combination with chemotherapy or radiation therapy.

~~42~~27. The ~~ABM,~~ antibody or composition of any of claims ~~35~~23-~~41~~26, wherein the subject is a human.

~~43~~28. Use of the ~~ABM or~~ antibody of any of claims 1-~~30~~ 15 or the composition of claim ~~34~~ 19 in the manufacture of a medicament for treating a subject having a cancer that abnormally expresses CEA.

~~44~~29. The use of claim ~~43~~28, wherein the cancer is selected from the group consisting of colorectal cancer, non-small cell lung cancer (NSCLC), gastric cancer, pancreatic cancer and breast cancer.

30. The use of claims 28 or 29, wherein the antibody or composition is for administration in combination with chemotherapy or radiation therapy.

31. The use of any of claims 28-30, wherein the subject is a human.