

CLAIMS

What is claimed is

1. An isolated antibody that specifically binds to 78-kDa glucose-regulated protein (GRP78), wherein the antibody comprises a heavy chain variable domain comprising a CDR1, CDR2, and a CDR3, wherein the heavy chain variable domain CDR1 comprises SEQ ID NO: 72, the heavy chain variable region domain CDR2 comprises SEQ ID NO:73, and the heavy chain variable region domain CDR3 selected from the group consisting of SEQ ID NO:3, 9, 23, 31, 39, and 47; and a light chain variable domain comprising a CDR1, CDR2, and CDR3, wherein the light chain variable domain CDR1 comprises SEQ ID NO:74, the light chain variable region domain CDR2 comprises SEQ ID NO:75, and the light chain variable region domain CDR3 comprises SEQ ID NO:76.
2. An isolated antibody that specifically binds to 78-kDa glucose-regulated protein (GRP78), wherein the antibody comprises a heavy chain variable domain comprising a CDR1, CDR2, and a CDR3, wherein the heavy chain variable domain CDR1 comprises SEQ ID NO: 1, the heavy chain variable region domain CDR2 comprises SEQ ID NO:2, and the heavy chain variable region domain CDR3 comprises SEQ ID NO:3; and a light chain variable domain comprising a CDR1, CDR2, and CDR3, wherein the light chain variable domain CDR1 comprises SEQ ID NO:4, the light chain variable region domain CDR2 comprises SEQ ID NO:5, and the light chain variable region domain CDR3 comprises SEQ ID NO:6.
3. An isolated antibody that specifically binds to 78-kDa glucose-regulated protein (GRP78), wherein the antibody comprises a heavy chain variable domain comprising a CDR1, CDR2, and a CDR3, wherein the heavy chain variable domain CDR1 comprises SEQ ID NO: 7, the heavy chain variable region domain CDR2 comprises SEQ ID NO:8, and the heavy chain variable region domain CDR3 comprises SEQ ID NO:9; and a light chain variable domain comprising a CDR1, CDR2, and CDR3, wherein the light chain variable domain CDR1

comprises SEQ ID NO:10, the light chain variable region domain CDR2 comprises SEQ ID NO:11, and the light chain variable region domain CDR3 comprises SEQ ID NO:12.

4. An isolated antibody that specifically binds to 78-kDa glucose-regulated protein (GRP78), wherein the antibody comprises a heavy chain variable domain comprising a CDR1, CDR2, and a CDR3, wherein the heavy chain variable domain CDR1 comprises SEQ ID NO: 21, the heavy chain variable region domain CDR2 comprises SEQ ID NO:22, and the heavy chain variable region domain CDR3 comprises SEQ ID NO:23; and a light chain variable domain comprising a CDR1, CDR2, and CDR3, wherein the light chain variable domain CDR1 comprises SEQ ID NO:24, the light chain variable region domain CDR2 comprises SEQ ID NO:25, and the light chain variable region domain CDR3 comprises SEQ ID NO:26.
5. An isolated antibody that specifically binds to 78-kDa glucose-regulated protein (GRP78), wherein the antibody comprises a heavy chain variable domain comprising a CDR1, CDR2, and a CDR3, wherein the heavy chain variable domain CDR1 comprises SEQ ID NO:29, the heavy chain variable region domain CDR2 comprises SEQ ID NO:30, and the heavy chain variable region domain CDR3 comprises SEQ ID NO:31; and a light chain variable domain comprising a CDR1, CDR2, and CDR3, wherein the light chain variable domain CDR1 comprises SEQ ID NO:32, the light chain variable region domain CDR2 comprises SEQ ID NO:33, and the light chain variable region domain CDR3 comprises SEQ ID NO:34.
6. An isolated antibody that specifically binds to 78-kDa glucose-regulated protein (GRP78), wherein the antibody comprises a heavy chain variable domain comprising a CDR1, CDR2, and a CDR3, wherein the heavy chain variable domain CDR1 comprises SEQ ID NO:37, the heavy chain variable region domain CDR2 comprises SEQ ID NO:38, and the heavy chain variable region domain CDR3 comprises SEQ ID NO:39; and a light chain variable domain comprising a

CDR1, CDR2, and CDR3, wherein the light chain variable domain CDR1 comprises SEQ ID NO:40, the light chain variable region domain CDR2 comprises SEQ ID NO:41, and the light chain variable region domain CDR3 comprises SEQ ID NO:42.

7. An isolated antibody that specifically binds to 78-kDa glucose-regulated protein (GRP78), wherein the antibody comprises a heavy chain variable domain comprising a CDR1, CDR2, and a CDR3, wherein the heavy chain variable domain CDR1 comprises SEQ ID NO:45, the heavy chain variable region domain CDR2 comprises SEQ ID NO:46, and the heavy chain variable region domain CDR3 comprises SEQ ID NO:47; and a light chain variable domain comprising a CDR1, CDR2, and CDR3, wherein the light chain variable domain CDR1 comprises SEQ ID NO:48, the light chain variable region domain CDR2 comprises SEQ ID NO:49, and the light chain variable region domain CDR3 comprises SEQ ID NO:50.
8. The isolated antibody of claim 2, wherein the antibody comprises a heavy chain variable domain comprising SEQ ID NO: 13 and/or a light chain variable domain comprising SEQ ID NO: 14.
9. The isolated antibody of claim 3, wherein the antibody comprises a heavy chain variable domain comprising SEQ ID NO: 15 and/or a light chain variable domain comprising SEQ ID NO: 16.
10. The isolated antibody of claim 4, wherein the antibody comprises a heavy chain variable domain comprising SEQ ID NO: 27 and/or a light chain variable domain comprising SEQ ID NO: 28.
11. The isolated antibody of claim 5, wherein the antibody comprises a heavy chain variable domain comprising SEQ ID NO: 35 and/or a light chain variable domain comprising SEQ ID NO: 36.

12. The isolated antibody of claim 6, wherein the antibody comprises a heavy chain variable domain comprising SEQ ID NO: 43 and/or a light chain variable domain comprising SEQ ID NO: 44.
13. The isolated antibody of claim 7, wherein the antibody comprises a heavy chain variable domain comprising SEQ ID NO: 51 and/or a light chain variable domain comprising SEQ ID NO: 52.
14. The antibody of any one of claims 1-13, wherein the antibody is selected from the group consisting of a humanized antibody, a single chain variable fragment (scFv) antibody, an antibody fragment, or a chimeric antibody.
15. The antibody of any one of claims 1-14, wherein the antibody is conjugated directly or indirectly to a payload selected from the group consisting of a therapeutic agent, an imaging agent, or a combination thereof.
16. ~~A method of enhancing radiotherapy in a subject in need thereof comprising administering an effective amount~~Use of a composition comprising an antibody that specifically binds to 78-kDa glucose-regulated protein (GRP78)~~such that radiotherapy is enhanced~~in the manufacture of a medicament for enhancing radiotherapy in a subject, wherein the antibody is conjugated directly or indirectly to a payload selected from the group consisting of a therapeutic agent, an imaging agent, or a combination thereof and wherein the antibody is an isolated antibody of claims 1-13.
- ~~17. The method of claim 9, further comprising administering ionizing radiation to the subject.~~
- ~~18. The method of claim 9, further comprising imaging the subject.~~
- ~~19.~~17. The ~~method~~use of claim ~~9~~16, wherein, the therapeutic agent is one or more of a CAR-bearing immune effector cell, a BITE, or a DART.

~~20.18. A method of imaging a tumor or a cancer in a subject in need thereof, the method comprising administering a composition comprising the conjugated GRP78 to the subject, and imaging cancer in a subject, Use of a composition comprising using~~ an antibody of claims 1-13 in the manufacture of a medicament for imaging a tumor or cancer in a subject, wherein the antibody is conjugated to an imaging agent.

~~21.19. A method of treating a tumor or a cancer in a subject in need thereof comprising administering an effective amount~~ Use of a composition comprising an antibody of any one of claims 1-13 in the manufacture of a medicament for treating a tumor or a cancer in a subject, wherein the antibody is conjugated directly or indirectly to a therapeutic agent.