

CLAIMS

What is claimed is:

1. A Galectin-9 (GAL9) antigen binding molecule, comprising: a first antigen binding site (ABS) specific for a first epitope of a first GAL9 antigen, wherein the first antigen binding site comprises all three VH CDRs from any one of the ABS clones selected from P9-28, P9-02B, P9-04, P9-05, P9-08, P9-09, P9-10, P9-15, P9-16, P9-18, P9-19, P9-20, P9-21, P9-22, P9-27, P9-31, P9-32, P9-36, P9-39, P9-49, P9-54, and P9-58.
2. A Galectin-9 (GAL9) antigen binding molecule, comprising a first antigen binding site (ABS) specific for a first epitope of a first GAL9 antigen, wherein the first antigen binding site comprises all three VL CDRs from any one of the ABS clones selected from P9-28, P9-02B, P9-04, P9-05, P9-08, P9-09, P9-10, P9-15, P9-16, P9-18, P9-19, P9-20, P9-21, P9-22, P9-27, P9-31, P9-32, P9-36, P9-39, P9-49, P9-54, and P9-58.
3. A Galectin-9 (GAL9) antigen binding molecule, comprising a first antigen binding site (ABS) specific for a first epitope of a first GAL9 antigen, wherein the first antigen binding site comprises all three VH CDRs and all three VL CDRs from any one of the ABS clones selected from P9-28, P9-02B, P9-04, P9-05, P9-08, P9-09, P9-10, P9-15, P9-16, P9-18, P9-19, P9-20, P9-21, P9-22, P9-27, P9-31, P9-32, P9-36, P9-39, P9-49, P9-54, and P9-58.
4. A Galectin-9 (GAL9) antigen binding molecule, comprising a first antigen binding site (ABS) specific for a first epitope of a first GAL9 antigen, wherein the first antigen binding site comprises the VL sequence and the VH sequence from any one of the ABS clones selected from P9-28, P9-02B, P9-04, P9-05, P9-08, P9-09, P9-10, P9-15, P9-16, P9-18, P9-19, P9-20, P9-21, P9-22, P9-27, P9-31, P9-32, P9-36, P9-39, P9-49, P9-54, and P9-58.
5. The GAL9 antigen binding molecule of claim 4, wherein the first antigen binding site (ABS) further comprises a first IgG heavy chain polypeptide and a first IgG light chain polypeptide.
6. The GAL9 antigen binding molecule of any one of claims 1-5, wherein the GAL9 antigen is a human GAL9 antigen.

7. A GAL9 antigen binding molecule, wherein the GAL9 antigen binding molecule increases TNF- α secretion by activated immune cells, wherein the increase is greater than an 80-fold increase relative to activated immune cells treated with a control agent.
8. A GAL9 antigen binding molecule, wherein the GAL9 antigen binding molecule increases IFN γ secretion by activated immune cells, wherein the increase is greater than an 1.2-fold increase relative to activated immune cells treated with a control agent.
9. A GAL9 antigen binding molecule, wherein the GAL9 antigen binding molecule increases CD40L surface expression of Activated CD8 $^{+}$ T-cells, wherein the increase is greater than a 2-fold increase relative to activated CD8 $^{+}$ T-cells treated with a control agent.
10. A GAL9 antigen binding molecule, wherein the GAL9 antigen binding molecule increases OX40 surface expression of Activated CD8 $^{+}$ T-cells, wherein the increase is greater than a 2-fold increase relative to activated CD8 $^{+}$ T-cells treated with a control agent.
11. A GAL9 antigen binding molecule, wherein the GAL9 antigen binding molecule increases IL-12 production of activated dendritic cells (DCs), wherein the increase is greater than an 20-fold increase relative to activated DCs treated with a control agent.
12. A GAL9 antigen binding molecule, wherein the GAL9 antigen binding molecule increases PD-L2 surface expression on activated dendritic cells (DCs), wherein the increase is greater than an 4-fold increase relative to activated DCs treated with a control agent.
13. A GAL9 antigen binding molecule, wherein the GAL9 antigen binding molecule demonstrates one or more of the following properties:
 - A) increases TNF- α secretion by activated immune cells, wherein the increase is greater than an 80-fold increase relative to activated immune cells treated with a control agent,
 - B) increases IFN- γ secretion by activated immune cells, wherein the increase is greater than an 1.2-fold increase relative to activated immune cells treated with a control agent,
 - C) increases CD40L surface expression of activated CD8 $^{+}$ T-cells, wherein the increase is greater than a 2-fold increase relative to activated CD8 $^{+}$ T-cells treated with a control agent

agent,

D) increases OX40 surface expression of activated CD8⁺ T-cells, wherein the increase is greater than a 2-fold increase relative to activated CD8⁺ T-cells treated with a control agent,

E) increases IL-12 production of activated dendritic cells (DCs), wherein the increase is greater than an 20-fold increase relative to activated DCs treated with a control agent,

F) increases PD-L2 surface expression on activated dendritic cells (DCs), wherein the increase is greater than an 4-fold increase relative to activated DCs treated with a control agent.

14. The GAL9 antigen binding molecule of any one of claims 7-13, wherein the control agent is a negative control agent or positive control agent.
15. The GAL9 antigen binding molecule of claim 14, wherein the control agent is a control antibody.
16. The GAL9 antigen binding molecule of claim 15, wherein the control antibody is selected from the group consisting of: an ECA42 clone anti-GAL9 antibody, an RG9.1 clone anti-GAL9 antibody, an RG9.35 clone anti-GAL9 antibody, an anti-PD1 antibody, and a non-GAL9 binding isotype control antibody.