

In another aspect, the present disclosure provides the use of an engineered polypeptide in the manufacture of a medicament for treating an autoimmune disease; wherein said autoimmune disease comprises systemic lupus erythematosus (SLE), multiple sclerosis (MS), Inflammatory bowel disease (IBD), Rheumatoid arthritis, Sjögren syndrome, dermatomyositis, autoimmune hemolytic anemia, Neuromyelitis optica (NMO), NMO Spectrum Disorder (NMOSD), idiopathic thrombocytopenic purpura (ITP), antineutrophil cytoplasmic autoantibodies (ANCA) associated with systemic autoimmune small vessel vasculitis syndromes or microscopic polyangiitis (MPA), granulomatosis with polyangiitis (GPA, Wegener's granulomatosis), or eosinophilic granulomatosis with polyangiitis (EGPA, Churg-Strauss syndrome); wherein the engineered polypeptide comprises a chimeric antigen receptor polypeptide comprising a signal peptide, antigen recognition domain, a hinge region, a transmembrane domain, a signaling domain, and a co-stimulatory domain; and wherein said antigen recognition domain comprises FcER1A; and at least one enhancer; wherein a cleavage site is disposed between the chimeric antigen receptor polypeptide and enhancer.

In yet another aspect, the present disclosure provides the use of an effective amount of engineered cells in the manufacture of a medicament for treating asthma in a patient; wherein the engineered cells comprise: a chimeric antigen receptor polypeptide comprising a signal peptide, antigen recognition domain, a hinge region, a transmembrane domain, a signaling domain, and a co-stimulatory domain; and wherein said antigen recognition domain comprises FcER1A. In yet another aspect, the present disclosure provides the use of engineered polypeptides in the manufacture of a medicament for preventing or mediating organ rejection in a patient; wherein the engineered polypeptides comprise a chimeric antigen receptor polypeptide comprising a signal peptide, antigen recognition domain, a hinge region, a transmembrane domain, a signaling domain, and a co-stimulatory domain; and wherein said antigen recognition domain comprises FcER1A; and at least one enhancer; wherein a cleavage site is disposed between the chimeric antigen receptor polypeptide and enhancer. In another example, the present disclosure provides a method of treating asthma. The method includes administering an engineered cell described above.

In another example, the present disclosure provides a method of treating organ rejection. The method includes administering an engineered cell described above.

## CLAIMS

1. Use of an engineered cell in the manufacture of a medicament for treating asthma;

wherein the engineered cell comprises: a chimeric antigen receptor polypeptide comprising a signal peptide, antigen recognition domain, a hinge region, a transmembrane domain, a signaling domain, and a co-stimulatory domain; and

wherein said antigen recognition domain comprises FcER1A.

2. Use of an engineered cell in the manufacture of a medicament for treating an autoimmune disease; wherein said autoimmune disease comprises systemic lupus erythematosus (SLE),

multiple sclerosis (MS), Inflammatory bowel disease (IBD), Rheumatoid arthritis, Sjögren syndrome, dermatomyositis, autoimmune hemolytic anemia, Neuromyelitis optica (NMO),

NMO Spectrum Disorder (NMOSD), idiopathic thrombocytopenic purpura (ITP), antineutrophil cytoplasmic autoantibodies (ANCAs) associated with systemic autoimmune small vessel vasculitis syndromes or microscopic polyangiitis (MPA), granulomatosis with polyangiitis (GPA, Wegener's granulomatosis), or eosinophilic granulomatosis with polyangiitis (EGPA,

Churg-Strauss syndrome);

wherein the engineered cell comprises: a chimeric antigen receptor polypeptide comprising a signal peptide, antigen recognition domain, a hinge region, a transmembrane domain, a signaling domain, and a co-stimulatory domain; and

wherein said antigen recognition domain comprises FcER1A.

3. Use of an engineered polynucleotide in the manufacture of a medicament for treating an autoimmune disease; wherein said autoimmune disease comprises systemic lupus erythematosus (SLE), multiple sclerosis (MS), Inflammatory bowel disease (IBD), Rheumatoid arthritis,

Sjögren syndrome, dermatomyositis, autoimmune hemolytic anemia, Neuromyelitis optica (NMO), NMO Spectrum Disorder (NMOSD), idiopathic thrombocytopenic purpura (ITP), antineutrophil cytoplasmic autoantibodies (ANCA) associated with systemic autoimmune small vessel vasculitis syndromes or microscopic polyangiitis (MPA), granulomatosis with polyangiitis (GPA, Wegener's granulomatosis), or eosinophilic granulomatosis with polyangiitis (EGPA, Churg-Strauss syndrome);

wherein the engineered polynucleotide comprises a chimeric antigen receptor polypeptide comprising a signal peptide, antigen recognition domain, a hinge region, a transmembrane domain, a signaling domain, and a co-stimulatory domain; and

wherein said antigen recognition domain comprises FcER1A; and at least one enhancer; wherein a high efficiency cleavage site is disposed between the chimeric antigen receptor polypeptide and enhancer.

4. Use of an effective amount of engineered cells in the manufacture of a medicament for treating asthma in a patient;

wherein the engineered cells comprise: a chimeric antigen receptor polypeptide comprising a signal peptide, antigen recognition domain, a hinge region, a transmembrane domain, a signaling domain, and a co-stimulatory domain; and

wherein said antigen recognition domain comprises FcER1A.

5. Use of an effective amount of engineered polynucleotides in the manufacture of a medicament for preventing or mediating organ rejection in a patient;

wherein the engineered polynucleotide comprises a chimeric antigen receptor polypeptide comprising a signal peptide, antigen recognition domain, a hinge region, a transmembrane domain, a signaling domain, and a co-stimulatory domain; and

wherein said antigen recognition domain comprises FcER1A; and at least one enhancer;

- 5 wherein a high efficiency cleavage site is disposed between the chimeric antigen receptor polypeptide and enhancer.