

CLAIMS

What is claimed is:

1. A ~~peptide~~polypeptide comprising an amino acid sequence of SEQ. ID. NO: 27.
2. The ~~peptide~~polypeptide of claim 1, further comprising a N-terminal leader peptide having the sequence of SEQ. ID. No: 7.
3. The ~~peptide~~polypeptide of claim 1, further comprising a linker peptide at the C-terminus.
4. The ~~peptide~~polypeptide of claim 3, wherein the linker peptide comprises the sequence of (GGGGS)_n, wherein n is 1, 2, 3, or 4.
5. The ~~peptide~~polypeptide of claim 4, wherein n is 1.
6. The ~~peptide~~polypeptide of claim 4, wherein n is 2.
7. The ~~peptide~~polypeptide of claim 4, wherein n is 3.
8. The ~~peptide~~polypeptide of claim 4, wherein n is 4.
9. The ~~peptide~~polypeptide of claim 1, further comprising a Fc ~~peptide~~polypeptide.
10. The ~~peptide~~polypeptide of claim 9, wherein the Fc ~~peptide~~polypeptide comprises the sequence of SEQ ID NO: 8 or SEQ ID NO: 15.
11. The ~~peptide~~polypeptide of claim 9, further comprising a leader peptide having the sequence of SEQ. ID. No: 7 at the N-terminus.
12. The ~~peptide~~polypeptide of claim 9, wherein the Fc peptide is at the C-terminus.
13. The ~~peptide~~polypeptide of claim 9, wherein the Fc peptide is at the N-terminus.
14. The ~~peptide~~polypeptide of claim 1, further comprising a linker peptide that links the peptide of SEQ ID NO: 27 and a Fc peptide.
15. The ~~peptide~~polypeptide of claim 14, further comprising a leader peptide having the sequence of SEQ. ID. No: 7 at the N-terminus.
16. The ~~peptide~~polypeptide of claim 14, wherein the linker peptide is (GGGGS)_n, n is 1, 2, 3, or 4.

17. The ~~peptide~~polypeptide of claim 16, wherein n is 4.
18. The ~~peptide~~polypeptide of claim 14, wherein the Fc peptide comprises the sequence of SEQ ID NO: 8 or SEQ ID NO: 15.
19. The ~~peptide~~polypeptide of claim 14, wherein the Fc peptide is at the C-terminus.
20. The ~~peptide~~polypeptide of claim 14, wherein the Fc peptide is at the N-terminus.
21. The ~~peptide~~polypeptide of claim 14, wherein the peptide comprises a ~~peptide comprising~~ the sequence of SEQ ID NO: 40.
22. A pharmaceutical composition comprising a ~~peptide~~polypeptide of claim 1 and a pharmaceutical carrier.
23. A pharmaceutical composition comprising a ~~peptide~~polypeptide of claim 14 and a pharmaceutical carrier.
24. A pharmaceutical composition comprising a ~~peptide~~polypeptide of claim 19 and a pharmaceutical carrier.
25. A pharmaceutical composition comprising a ~~peptide~~polypeptide of claim 24~~21~~ and a pharmaceutical carrier.
26. A ~~peptide~~polypeptide comprising an amino acid sequence of SEQ. ID. NO: 26.
27. The ~~peptide~~polypeptide of claim 46~~26~~, further comprising a N-terminal leader peptide having the sequence of SEQ. ID. No: 7.
28. The ~~peptide~~polypeptide of claim 26, further comprising a linker peptide at the C-terminus.
29. The ~~peptide~~polypeptide of claim 28, wherein the linker peptide comprises the sequence of (GGGS)n, wherein n is 1, 2, 3, or 4.
30. The ~~peptide~~polypeptide of claim 29, wherein n is 1.
31. The ~~peptide~~polypeptide of claim 29, wherein n is 2.
32. The ~~peptide~~polypeptide of claim 29, wherein n is 3.
33. The ~~peptide~~polypeptide of claim 29, wherein n is 4.

34. The ~~peptide~~polypeptide of claim 26, further comprising a Fc ~~peptide~~polypeptide.
35. The ~~peptide~~polypeptide of claim 34, wherein the Fc ~~peptide~~polypeptide comprises the sequence of SEQ ID NO: 8 or SEQ ID NO: 15.
36. The ~~peptide~~polypeptide of claim 34, further comprising a leader peptide having the sequence of SEQ. ID. No: 7 at the N-terminus.
37. The ~~peptide~~polypeptide of claim 34, wherein the Fc ~~peptide~~polypeptide is at the C-terminus.
38. The ~~peptide~~polypeptide of claim 34, wherein the Fc ~~peptide~~polypeptide is at the N-terminus.
39. The ~~peptide~~polypeptide of claim 26, further comprising a linker peptide that links the peptide of SEQ ID NO: 26 and a Fc peptide.
40. The ~~peptide~~polypeptide of claim 39, further comprising a leader peptide having the sequence of SEQ. ID. No: 7 at the N-terminus.
41. The ~~peptide~~polypeptide of claim ~~49~~39, wherein the linker peptide is (GGGS)n, wherein n is 1, 2, 3, or 4.
42. The ~~peptide~~polypeptide of claim ~~42~~41, wherein n is 4.
43. The ~~peptide~~polypeptide of claim 39, wherein the Fc ~~peptide~~polypeptide comprises the sequence of SEQ ID NO: 8 or SEQ ID NO: 15.
44. The ~~peptide~~polypeptide of claim 39, wherein the Fc ~~peptide~~polypeptide is at the C-terminus.
45. The ~~peptide~~polypeptide of claim 39, wherein the Fc ~~peptide~~polypeptide is at the N-terminus.
46. The ~~peptide~~polypeptide of claim 39, wherein the peptide comprises ~~a peptide comprising~~ the sequence of SEQ ID NO: 39.
47. A pharmaceutical composition comprising a ~~peptide~~polypeptide of claim ~~26~~5 and a pharmaceutical carrier.
48. A pharmaceutical composition comprising a ~~peptide~~polypeptide of claim 39 and a

pharmaceutical carrier.

49. A pharmaceutical composition comprising a ~~peptide~~polypeptide of claim 43 and a pharmaceutical carrier.

50. A pharmaceutical composition comprising a ~~peptide~~polypeptide of claim 46 and a pharmaceutical carrier.

51. A method of activating T regulatory cells, the method comprising contacting a T regulatory cell with a ~~peptide~~polypeptide of any one of claims ~~1-47~~1-21 and 26-46 or the pharmaceutical composition of any one of claims 22-25 and 47-50.

~~52. A method of treating an inflammatory disorder in a subject, said method comprising administering to a subject in need thereof a therapeutically effective amount of a peptide of any one of claims 1-47 or the pharmaceutical composition of any one of claims 48-50.~~

~~53. The method of claim 52, wherein the inflammatory disorder is alopecia areata, atopic dermatitis, dermatitis herpetiformis, psoriasis, lupus, graft versus host disease (GVHD), inflammation, autoimmune disease, atopic diseases, paraneoplastic autoimmune diseases, cartilage inflammation, arthritis, rheumatoid arthritis, juvenile arthritis, juvenile rheumatoid arthritis, pauciarticular juvenile rheumatoid arthritis, polyarticular juvenile rheumatoid arthritis, systemic onset juvenile rheumatoid arthritis, juvenile ankylosing spondylitis, juvenile enteropathic arthritis, juvenile reactive arthritis, juvenile Reiter's Syndrome, SEA Syndrome (Seronegativity, Enthesopathy, Arthropathy Syndrome), juvenile dermatomyositis, juvenile psoriatic arthritis, juvenile scleroderma, juvenile systemic lupus erythematosus, juvenile vasculitis, pauciarticular rheumatoid arthritis, polyarticular rheumatoid arthritis, systemic onset rheumatoid arthritis, ankylosing spondylitis, enteropathic arthritis, reactive arthritis, Reiter's Syndrome, SEA Syndrome (Seronegativity, Enthesopathy, Arthropathy Syndrome), dermatomyositis, psoriatic arthritis, scleroderma, vasculitis, myolitis, polymyolitis, dermatomyolitis, polyarteritis nodosa, Wegener's granulomatosis, arteritis, ploymyalgia rheumatica, sarcoidosis, sclerosis, primary biliary sclerosis, sclerosing cholangitis, Sjogren's syndrome, plaque psoriasis, guttate psoriasis, inverse psoriasis, pustular psoriasis, erythrodermic psoriasis, dermatitis, atherosclerosis, Still's disease, Systemic Lupus Erythematosus (SLE), myasthenia gravis, inflammatory bowel disease (IBD), Crohn's disease, ulcerative colitis, celiac disease, multiple sclerosis (MS), asthma, COPD, rhinosinusitis, rhinosinusitis with polyps,~~

~~eosinophilic esophagitis, eosinophilic bronchitis, Guillain-Barre disease, Type I diabetes mellitus, thyroiditis(e.g., Graves' disease), Addison's disease, Raynaud's phenomenon, autoimmune hepatitis, steroid refractory chronic graft versus host disease, transplantation rejection(e.g. kidney, lung, heart, skin, and the like), kidney damage, hepatitis C induced vasculitis, spontaneous loss of pregnancy, alopecia, vitiligo, focal segmental glomerulosclerosis (FSGS), Minimal Change Disease, Membranous Nephropathy, ANCA Associated Glomerulonephropathy, Membranoproliferative Glomerulonephritis, IgA Nephropathy, lupus nephritis, and the like.~~

~~5452. Use of A method of promoting or stimulating STAT5 phosphorylation in T regulatory cells, said method administering to a subject in need thereof a therapeutically effective amount of a peptide~~the polypeptide ~~of any one of claims 1-471-21 and 26-46 or the pharmaceutical composition of any one of claims 22-25 and 48-5047-50 in the manufacture of a medicament for promoting or stimulating STAT5 phosphorylation in T regulatory cells in a subject in need thereof.~~

~~5553. Use of a peptide~~the polypeptide ~~of any one of claims 1-471-21 and 26-46 or the pharmaceutical composition of any one of claims 22-25 48-5047-50 in the preparation of a medicament for the treatment of an inflammatory disorder.~~

~~5654. The use of claim 5553, wherein the inflammatory disorder is alopecia areata, atopic dermatitis, dermatitis herpetiformis, psoriasis, lupus, graft versus host disease (GVHD), inflammation, autoimmune disease, atopic diseases, paraneoplastic autoimmune diseases, cartilage inflammation, arthritis, rheumatoid arthritis, juvenile arthritis, juvenile rheumatoid arthritis, pauciarticular juvenile rheumatoid arthritis, polyarticular juvenile rheumatoid arthritis, systemic onset juvenile rheumatoid arthritis, juvenile ankylosing spondylitis, juvenile enteropathic arthritis, juvenile reactive arthritis, juvenile Reiter's Syndrome, SEA Syndrome (Seronegativity, Enthesopathy, Arthropathy Syndrome), juvenile dermatomyositis, juvenile psoriatic arthritis, juvenile scleroderma, juvenile systemic lupus erythematosus, juvenile vasculitis, pauciarticular rheumatoid arthritis, polyarticular rheumatoid arthritis, systemic onset rheumatoid arthritis, ankylosing spondylitis, enteropathic arthritis, reactive arthritis, Reiter's Syndrome, SEA Syndrome (Seronegativity, Enthesopathy, Arthropathy Syndrome), dermatomyositis, psoriatic arthritis, scleroderma, vasculitis, myolitis, polymyolitis, dermatomyolitis, polyarteritis nodosa, Wegener's granulomatosis, arteritis, ploymyalgia~~

rheumatica, sarcoidosis, sclerosis, primary biliary sclerosis, sclerosing cholangitis, Sjogren's syndrome, plaque psoriasis, guttate psoriasis, inverse psoriasis, pustular psoriasis, erythrodermic psoriasis, dermatitis, atherosclerosis, Still's disease, Systemic Lupus Erythematosus (SLE), myasthenia gravis, inflammatory bowel disease (IBD), Crohn's disease, ulcerative colitis, celiac disease, multiple sclerosis (MS), asthma, COPD, rhinosinusitis, rhinosinusitis with polyps, eosinophilic esophagitis, eosinophilic bronchitis, Guillain-Barre disease, Type I diabetes mellitus, thyroiditis(e.g., Graves' disease), Addison's disease, Raynaud's phenomenon, autoimmune hepatitis, steroid refractory chronic graft versus host disease, transplantation rejection(e.g. kidney, lung, heart, skin, and the like), kidney damage, hepatitis C-induced vasculitis, spontaneous loss of pregnancy, alopecia, vitiligo, focal segmental glomerulosclerosis (FSGS), Minimal Change Disease, Membranous Nephropathy, ANCA Associated Glomerulonephropathy, Membranoproliferative Glomerulonephritis, IgA Nephropathy, or lupus nephritis, ~~and the like.~~

~~5755.~~ A nucleic acid molecule encoding ~~a peptide~~ the polypeptide of any one of claims ~~1-471-~~ 21 and 26-46.

~~5856.~~ A vector comprising the nucleic acid molecule of claim ~~5755.~~

~~5957.~~ A plasmid comprising the nucleic acid molecule of claim ~~5755.~~

~~6058.~~ A cell comprising the nucleic acid molecule of ~~embodiment 57~~ claim 55.

~~6159.~~ A cell comprising the plasmid of claim ~~5957.~~

~~6260.~~ A cell comprising the vector of claim ~~5856.~~

~~6361.~~ A cell comprising or expressing ~~a peptide~~ the polypeptide of any one of claims ~~1-471-21~~ and 26-46 ~~or a peptide as described herein.~~