

CLAIMS

- ~~1.~~ An IL-7 binding protein that binds to one or more amino acid residue within the amino acid sequence set forth in SEQ ID NO:12 of human IL-7.
- ~~2.~~ The IL-7 binding protein of claim 1, which protects residues 67 to 81 (SEQ ID NO:12) of IL-7 from deuterium exchange in HDX-MS analysis.
- ~~3.~~ The IL-7 binding protein of claim 1, which protects residues 67 to 80 (SEQ ID NO:16) of IL-7 from deuterium exchange in HDX-MS analysis.
- ~~4.~~ An IL-7 binding protein that binds to human IL-7 adjacent an IL-7R α binding site, with a K_D of about 100nM or less as measured by surface plasmon resonance assay.
- ~~5.~~ The IL-7 binding protein of claim 4, wherein the IL-7 binding protein inhibits IL-7 binding to IL-7R as measured in an *in vitro* competitive binding assay as determined using a surface plasmon resonance assay.
- ~~6.~~ The IL-7 binding protein according to any one of the preceding claims comprising one or more of CDRH1 as set out in SEQ ID NO:6, CDRH2 as set out in SEQ ID NO:7, CDRH3 as set out in SEQ ID NO:8, CDRL1 as set out in SEQ ID NO:9, CDRL2 as set out in SEQ ID NO:10 and/or CDRL3 as set out in SEQ ID NO:11.
- ~~7.~~ An IL-7 binding protein comprising CDRH1 as set out in SEQ ID NO:6, CDRH2 as set out in SEQ ID NO:7, CDRH3 as set out in SEQ ID NO:8, CDRL1 as set out in SEQ ID NO:9, CDRL2 as set out in SEQ ID NO:10 and CDRL3 as set out in SEQ ID NO:11.
- ~~8.~~ The IL-7 binding protein of claim 7, comprising a V_H domain having at least 90% identity to the amino acid sequence set out in SEQ ID NO:4 and/or a V_L domain having at least 90% identity to the amino acid sequence as set out in SEQ ID NO:5.
- ~~9.1.~~ The An IL-7 binding protein of claim 8 comprising a V_H domain as set out in SEQ ID NO:4 and a V_L domain as set out in SEQ ID NO:5.
- ~~10.2.~~ The IL-7 binding protein according to ~~any one of the preceding claims~~ claim 1, wherein the IL-7 binding protein comprises a constant region such that the IL-7 binding protein has reduced ADCC and/or complement activation or effector functionality.
- ~~11.3.~~ The IL-7 binding protein according to claim ~~102~~ 102, wherein the IL-7 binding protein comprises a heavy chain Fc domain having an alanine residue at position 235 and position 237 according to EU numbering.
- ~~12.4.~~ The IL-7 binding protein according to any one of the preceding claims, wherein the IL-7 binding protein comprises a scaffold selected from human IgG1 isotype and human IgG4 isotype.

- ~~13-5.~~ The IL-7 binding protein according to claim ~~124~~, wherein the IL-7 binding protein is of human IgG1 isotype.
- ~~14-6.~~ The IL-7 binding protein according to any one of the preceding claims, wherein the IL-7 binding protein is a monoclonal antibody.
- ~~15-7.~~ The IL-7 binding protein according to claim ~~146~~, wherein the monoclonal antibody is human, humanized or chimeric.
- ~~16-8.~~ The IL-7 binding protein according any one of the preceding claims 7 to 15, comprising a heavy chain having at least 90% identity to the amino acid sequence set out in SEQ ID NO:2 and a light chain having at least 90% identity to the amino acid sequence as set out in SEQ ID NO:3.
- ~~17-9.~~ The IL-7 binding protein according to claim ~~168~~, comprising a heavy chain as set out in SEQ ID NO:2 and a light chain as set out in SEQ ID NO:3.
- ~~18-10.~~ The IL-7 binding protein according to any one of the preceding claims, wherein the IL-7 binding protein binds to IL-7 with a K_D of 50 nM or less, 10 nM or less, 1 nM or less, or 0.1 nM or less.
- ~~19-11.~~ The IL-7 binding protein according to any one of the preceding claims, wherein the IL-7 binding protein binds to IL-7 and (i) inhibits IL-7 dependent IFN- γ or IL-10 secretion from peripheral blood mononuclear cells with an IC_{50} of 1 nM or less, and/or (ii) inhibits IL-7 dependent STAT5 phosphorylation in CD4⁺ T cells with an IC_{50} of 1 nM or less.
- ~~20-12.~~ The IL-7 binding protein according to any one of the preceding claims, wherein the IL-7 binding protein inhibits signaling, activation, cytokine production and proliferation of CD4⁺ T cells and/or CD8⁺ T cells.
- ~~21-13.~~ A nucleic acid sequence encoding an IL-7 binding protein as defined in any one of the preceding claims.
- ~~22-14.~~ An expression vector comprising a nucleic acid sequence as defined in claim ~~2113~~.
- ~~23-15.~~ A host cell comprising the nucleic acid sequence of claim ~~21-13~~ or the expression vector of claim ~~1422~~.
- ~~24-16.~~ An IL-7 binding protein expressed by the host cell of claim ~~2315~~.
- ~~25-17.~~ A method of making an IL-7 binding protein according to any one of claims ~~1-2012~~, the method comprising maintaining a host cell as defined in claim ~~23-15~~ in a medium to produce the IL-7 binding protein and isolating or purifying the IL-7 binding protein produced by the host cell.
- ~~26.~~ An IL-7 binding protein that competes for binding to IL-7 with the IL-7 binding protein of any one of claims ~~1-20 or 24~~.
- ~~27.~~ A pharmaceutical composition, comprising a pharmaceutically acceptable carrier or excipient and an IL-7 binding protein that exhibits binding for IL-7 at an epitope comprising at least 5 contiguous amino acids of a sequence set out in SEQ ID NO:12 or SEQ ID NO:16.

- ~~28-18.~~ A pharmaceutical composition comprising the IL-7 binding protein according to any one of claims 1-~~20-12~~ and ~~24-16~~, and a pharmaceutically acceptable carrier or excipient.
- ~~29-19.~~ An IL-7 binding protein as defined in any one of claims 1-~~20-12~~ or ~~24-16~~ for use in therapy.
- ~~30.~~ A method for the treatment of an autoimmune and/or inflammatory condition in a subject in need thereof, comprising administering to the subject a therapeutically effective amount of an IL-7 binding protein as defined in any one of claims 1-20 or 24 or the pharmaceutical composition as defined in claim 27 or 28.
- ~~31-20.~~ An IL-7 binding protein as defined in any one of claims 1-~~20-12~~ or ~~24-16~~ for use in the treatment of an autoimmune and/or inflammatory condition.
- ~~32-21.~~ Use of an IL-7 binding protein as defined in any one of claims 1-~~20-12~~ or ~~24-16~~ in the manufacture of a medicament for treatment of an autoimmune and/or inflammatory condition.
- ~~33-22.~~ The method according to claim ~~30~~, IL-7 binding protein for use according to claim ~~32-20~~ or use of an IL-7 binding protein according to claim ~~32-21~~, wherein the autoimmune and/or inflammatory condition is multiple sclerosis, Sjögren's syndrome, rheumatoid arthritis, Crohn's disease, ulcerative colitis or lupus erythematosus.
- ~~34-23.~~ The method according to claim ~~33~~, IL-7 binding protein for use according to claim ~~32~~ or use of an IL-7 binding protein according to claim ~~32-22~~, wherein the multiple sclerosis is clinically isolated syndrome, relapsing remitting, primary progressive or secondary progressive.
- ~~35-24.~~ A kit comprising the IL-7 binding protein according to any one of claims 1-~~20-12~~ or ~~24-16~~ and instructions for use.