CLAIMS:

1. A pharmaceutical composition for treating an autoimmune disease comprising a pharmaceutically acceptable carrier and an agent capable of activating CD4+CD25+ regulatory T cells, wherein the composition is to be administered to a subject at most every 3 days.

2. A pharmaceutical composition according to claim 1 wherein the period between administrations is at least four weeks.

3. A pharmaceutical composition according to claim 1 wherein the period between administrations is at least twelve weeks.

4. A pharmaceutical composition according to claim 1 wherein the period between administrations is at least twenty-four weeks.

5. A pharmaceutical composition according to claim 1, wherein the period between administrations is at least 6 calendar months.

6. A pharmaceutical composition according to claim 1, wherein the period between administrations is at least 1 year.

7. A pharmaceutical composition according to claim 1 wherein the composition is to be administered to a subject yearly over a period of 1 to 5 years.

8. A pharmaceutical composition according to any preceding claim, wherein the composition is to be administered to a subject in a dose of the agent from 0.2 mg to 200 mg per dose.

9. A pharmaceutical composition according any one of claims 1 to 7, wherein the composition is to be administered to a subject in a dose of the agent from 0.1 to 60 mg/m^2 body surface area of the subject.

10. A pharmaceutical composition according to any one of claims 1 to 7 wherein the composition is to be administered to a subject in a dose of the agent from 1 μg/kg to 2 mg/kg.

11. A pharmaceutical composition according to any one of claims 1 to 7 wherein the agent is present in a concentration of from10 μg/ml to 150 mg/ml.

12. A pharmaceutical composition according to any preceding claim wherein the autoimmune disease is selected from psoriasis, rheumatoid arthritis, multiple sclerosis, type-1 diabetes, inflammatory bowel diseases, Crohn's disease, Hashimoto's thyreoiditis, autoimmune thyreoiditis, autoimmune myasthenia gravis, systemic lupus erythematosus and transplantation-related diseases such as graft-versus-host or general organ tolerance issues.

13. A pharmaceutical composition according to any preceding claim wherein the autoimmune disease is psoriasis.

14. A pharmaceutical composition according to any preceding claim wherein the disease is rheumatoid arthritis.

15. A pharmaceutical composition according to any preceding claim wherein the composition is for parenteral administration.

16. A pharmaceutical composition according to claim 15, wherein the composition is for intramuscular administration, intravenous administration or subcutaneous administration.

17. A pharmaceutical composition according to claim 16 wherein the disease is psoriasis and the composition is for intravenous or subcutaneous administration.

18. A pharmaceutical composition according to claim 16 the composition is for intravenous administration and the composition is to be administered in a dose of 0.3 mg to 25 mg.

19. A pharmaceutical composition according to claim 16 wherein the disease is rheumatoid arthritis and the composition is for intravenous or subcutaneous administration.

20. A pharmaceutical composition according to any preceding claim wherein within the period of 10 minutes after the beginning of administration to 96 hours after completion of the administration the level of a cytokine in the subject's blood plasma is less than a 20 fold increase of the level immediately prior to administration, and wherein the cytokine is selected from IFN-γ, TNF-α, IL-6 and IL-2.

21. A pharmaceutical composition according to any one of claims 1 to 19 wherein within the period of 10 minutes after the beginning of administration to 96 hours after completion of the administration the level of a cytokine in the subject's blood plasma is less than a 20 fold increase of the upper limit of normal (ULN) value, wherein the cytokine is selected from IFN-γ, TNF-α, IL-6 and IL-2, and wherein the ULN value is 3.8, 2.8, 4.4, and 19.4 pg/ml respectively.

22. A pharmaceutical composition according to any preceding claim wherein within the period of 72 to 96 hours after administration the cell count of CD4+ lymphocytes in the subject's blood plasma is at least 200 cells/µl.

23. A pharmaceutical composition according to claim 22 wherein the cell count of CD4+ lymphocytes in the subject's blood plasma is at least 250 cells/µl.

24. A pharmaceutical composition according to any preceding claim wherein the agent is a humanized monoclonal antibody or fragment or derivative thereof.

25. A pharmaceutical composition according to claim 24 wherein the agent is an anti-CD4 antibody or fragment or derivative thereof.

26. A pharmaceutical composition according to any preceding claim wherein the agent is a humanized anti-CD4 antibody, or fragment or derivative thereof, having V domains defined by the following polypeptide sequences:

- H chain V domain:

EEQLVESGGGLVKPGGSLRLSCAASGFSFSDCRMYWLRQAPGKGLEWIGVISVKSEN YGANYAESVRGRFTISRDDSKNTVYLQMNSLKTEDTAVYYCSASYYRYDVGAWFA YWGQGTLVTVSS (SEQ ID NO: 1)

- L chain V domain:

DIVMTQSPDSLAVSLGERATINCRASKSVSTSGYSYIYWYQQKPGQPPKLLIYLASILE SGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQHSRELPWTFGQGTKVEIK (SEQ ID NO: 2).

or V domains comprising polypeptide sequences having at least 80% sequence identity with SEQ ID NO: 1 and SEQ ID NO: 2.

27. A pharmaceutical composition according to any preceding claim wherein the agent is a humanized anti-CD4 antibody derived from the mouse monoclonal anti-CD4 antibody B-F5.

28. A method of treatment of an autoimmune disease which method comprises administering a medicament to a subject, wherein the medicament comprises an agent capable of activating CD4+CD25+ regulatory T cells, and wherein the medicament is administered to the subject in a plurality of doses.

29. A method of treatment according to claim 28 wherein the medicament is administered to the subject according to any one of claims 2 to 7.

30. A method of treatment according to claim 28 or claim 29 wherein the medicament is administered to the subject in the dose specified in any one of claims 8 to 10.

31. A method of treatment according to any one of claims 28 to 30 wherein the autoimmune disease is as defined in any one of claims 12 to 14.

32. A method of treatment according to any one of claims 28 to 31 wherein the agent is a humanized anti-CD4 antibody or fragment or derivative thereof derived from the mouse monoclonal anti-CD4 antibody B-F5.

33. A method of treatment according to any one of claim 28 to 31 wherein the agent is a humanized anti-CD4 antibody or fragment or derivative thereof having V domains defined by the following polypeptide sequences:

- H chain V domain:

EEQLVESGGGLVKPGGSLRLSCAASGFSFSDCRMYWLRQAPGKGLEWIGVISVKSEN YGANYAESVRGRFTISRDDSKNTVYLQMNSLKTEDTAVYYCSASYYRYDVGAWFA YWGQGTLVTVSS (SEQ ID NO: 1)

- L chain V domain:

DIVMTQSPDSLAVSLGERATINCRASKSVSTSGYSYIYWYQQKPGQPPKLLIYLASILE SGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQHSRELPWTFGQGTKVEIK (SEQ ID NO: 2).

or V domains comprising polypeptide sequences having at least 80% sequence identity with SEQ ID NO: 1 and SEQ ID NO: 2.

34. A pharmaceutical composition according to any preceding claim wherein within the period of 3 to 6 hours after administration the cell count of CD4+ lymphocytes in the subject's blood plasma is below 250 cells/µl.

35. A pharmaceutical composition according to any one of claims 1 to 34 wherein within the period of 72 to 96 hours after administration the cell count of CD4+ lymphocytes in the subject's blood plasma is equal or higher than 50% of the cell count of the subject immediately prior to administration.

36. A pharmaceutical composition according to claim 13 wherein the composition is capable of treating psoriasis by providing at least a 40% improvement in the Psoriasis Area and Severity Index (PASI) score of the patient.

37. A pharmaceutical composition according to claim 13 wherein the composition is capable of treating psoriasis by providing at least a 50% improvement in the Psoriasis Area and Severity Index (PASI) score of the patient.

38. A pharmaceutical composition according to claim 36 or claim 37 wherein the improvement is seen at 56 days after administration of a single dose of the composition.

39. A pharmaceutical composition according to claim 36 or 37 wherein the improvement is seen at 75 days after administration of a single dose of the composition.

40. A pharmaceutical composition according to any one of claims 36 to 39 wherein the dose of the agent is 0.5 mg.

41. A pharmaceutical composition according to any one of claims 36 to 39 wherein the dose of the agent is 2.5 mg.

Claims:

1. Use of a humanized anti-CD4 antibody capable of activating CD4+CD25+ regulatory T cells for the manufacture of a medicament for treating an autoimmune disease in a subject, wherein the humanized anti-CD4 antibody comprises an H chain V domain, an L chain V domain, and an IgG1 constant domain wherein:

(a) the H chain V domain comprises the sequences DCRMY, VISVKSENYGANYAESVRG and SYYRYDVGAWFAY, and the L chain V domain comprises the sequences RASKSVSTSGYSYIY, LASILES and QHSRELPWT; and/or

(b) the H chain V domain has at least 80% sequence identity with SEQ ID No: 1 and the L chain V domain has at least 80% sequence identity with SEQ ID No: 2,

wherein the medicament is to be administered to the subject from every week to every 31 days,

and wherein the medicament is to be administered to the subject in a dose of the humanized anti-CD4 antibody of from 20 to 200 mg.

2. Use of a humanized anti-CD4 antibody for the manufacture of a medicament for treating an autoimmune disease in a subject, wherein the humanized anti-CD4 antibody comprises an H chain V domain, an L chain V domain, and an IgG1 constant domain, wherein the H chain V domain has SEQ ID No: 1, and the L chain V domain has SEQ ID NO: 2,

wherein the medicament is to be administered to the subject from every week to every 31 days,

and wherein the medicament is to be administered to the subject in a dose of the humanized anti-CD4 antibody of from 20 to 200 mg.

3. Use according to claim 1 or claim 2 wherein the dose of the humanized anti-CD4 antibody is from 20 to 100 mg.

4. Use of a humanized anti-CD4 antibody capable of activating CD4+CD25+ regulatory T cells for the manufacture of a medicament for treating an autoimmune disease in a subject, wherein the humanized anti-CD4 antibody comprises an H chain V domain, an L chain V domain, and an IgG1 constant domain wherein:

(a) the H chain V domain comprises the sequences DCRMY, VISVKSENYGANYAESVRG and SYYRYDVGAWFAY, and the L chain V domain comprises the sequences RASKSVSTSGYSYIY, LASILES and QHSRELPWT; and/or

(b) the H chain V domain has at least 80% sequence identity with SEQ ID No: 1 and the L chain V domain has at least 80% sequence identity with SEQ ID No: 2,

wherein the medicament is to be administered to the subject from every week to every 31 days,

and wherein the medicament is to be administered to the subject in a dose of the humanized anti-CD4 antibody of from 8 to 60 mg/m^2 body surface area of the subject.

5. Use of a humanized anti-CD4 antibody for the manufacture of a medicament for treating an autoimmune disease in a subject, wherein the humanized anti-CD4 antibody comprises an H chain V domain, an L chain V domain, and an IgG1 constant domain, wherein the H chain V domain has SEQ ID No: 1, and the L chain V domain has SEQ ID NO: 2,

wherein the medicament is to be administered to the subject from every week to every 31 days,

and wherein the medicament is to be administered to the subject in a dose of the humanized anti-CD4 antibody of from 8 to 60 mg/m^2 body surface area of the subject.

6. Use according to claim 4 or claim 5 wherein the dose of the humanized anti-CD4 antibody is from 8 to 50 mg/m^2.

7. Use of a humanized anti-CD4 antibody capable of activating CD4+CD25+ regulatory T cells for the manufacture of a medicament for treating an autoimmune disease in a subject, wherein the humanized anti-CD4 antibody comprises an H chain V domain, an L chain V domain, and an IgG1 constant domain wherein:

(a) the H chain V domain comprises the sequences DCRMY, VISVKSENYGANYAESVRG and SYYRYDVGAWFAY, and the L chain V domain comprises the sequences RASKSVSTSGYSYIY, LASILES and QHSRELPWT; and/or

(b) the H chain V domain has at least 80% sequence identity with SEQ ID No: 1 and the L chain V domain has at least 80% sequence identity with SEQ ID No: 2,

wherein the medicament is to be administered to the subject from every week to every 31 days,
and wherein the medicament is to be administered to the subject in a dose of the humanized anti-CD4 antibody of from 0.2 to 2 mg/kg.

8. Use of a humanized anti-CD4 antibody for the manufacture of a medicament for treating an autoimmune disease in a subject, wherein the humanized anti-CD4 antibody comprises an H chain V domain, an L chain V domain, and an IgG1 constant domain, wherein the H chain V domain has SEQ ID No: 1, and the L chain V domain has SEQ ID NO: 2,
wherein the medicament is to be administered to the subject from every week to every 31 days,
and wherein the medicament is to be administered to the subject in a dose of the humanized anti-CD4 antibody of from 0.2 to 2 mg/kg.

9. Use according to claim 7 or claim 8 wherein the dose of the humanized anti-CD4 antibody is from 0.2 to 1.5 mg/kg.

10. Use according to any preceding claim wherein the medicament is to be administered every week, every 10 days, every four weeks or every calendar month.

11. Use according to any preceding claim wherein the medicament is to be administered intramuscularly, intravenously or subcutaneously.

12. Use according to any preceding claim wherein the autoimmune disease is selected from psoriasis, rheumatoid arthritis, multiple sclerosis, type-1 diabetes, inflammatory bowel diseases, Crohn's disease, autoimmune thyroiditis, autoimmune myasthenia gravis, systemic lupus erythematosus and transplantation-related diseases.

13. Use according to claim 12, wherein the transplantation-related disease is graft-versus-host or general organ tolerance issues.

14. Use according to claim 12, wherein the disease is psoriasis or rheumatoid arthritis.

15. A kit when used for treating an autoimmune disease, wherein the kit comprises a plurality of doses of a pharmaceutical composition, the pharmaceutical composition comprising a humanized anti-CD4 antibody capable of activating CD4+CD25+ regulatory T cells and a pharmaceutically acceptable carrier, the pharmaceutical composition of each dose comprising from 20 to 200 mg of the humanized anti-CD4 antibody, wherein the humanized anti-CD4 antibody comprises an H chain V domain, an L chain V domain, and an IgG1 constant domain, wherein:

(a) the H chain V domain comprises the sequences DCRMY, VISVKSENYGANYAESVRG and SYYRYDVGAWFAY, and the L chain V domain comprises the sequences RASKSVSTSGYSYIY, LASILES and QHSRELPWT; and/or

(b) the H chain V domain has at least 80% sequence identity with SEQ ID No: 1 and the L chain V domain has at least 80% sequence identity with SEQ ID No: 2.

16. A kit according to claim 15 wherein the humanized anti-CD4 antibody has V domains defined by the following polypeptide sequences:

- H chain V domain:

EEQLVESGGGLVKPGGSLRLSCAASGFSFSDCRMYWLRQAPGKGLEWIGVISVKSEN YGANYAESVRGRFTISRDDSKNTVYLQMNSLKTEDTAVYYCSASYYRYDVGAWFA YWGQGTLVTVSS (SEQ ID NO: 1)

- L chain V domain:

DIVMTQSPDSLAVSLGERATINCRASKSVSTSGYSYIYWYQQKPGQPPKLLIYLASILE SGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQHSRELPWTFGQGTKVEIK (SEQ ID NO: 2),

or V domains comprising polypeptide sequences having at least 90% sequence identity with SEQ ID NO: 1 and SEQ ID NO: 2.