WHAT IS CLAIMED IS:

1. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to ~~the~~ a population of cells comprising immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

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(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

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(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

2. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising ~~the~~ immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

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3. The use of claim 1 or 2, further comprising a reduced intensity conditioning protocol.

4. The use of claim 1 or 2, further comprising an *in-vivo* T cell debulking protocol.

5. The use of claim 1 or 2, wherein a dose of said T cell depleted immature hematopoietic cells comprises 5 - 40 x $10^6$ CD34+ cells per kilogram body weight.

6. The use of claim 5, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 10 x $10^6$ CD34+ cells per kilogram body weight.

7. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are selected from the group consisting of T cell depleted bone marrow cells, T cell depleted G-CSF mobilized peripheral blood progenitor cells, T cell depleted

cord blood, purified CD34+ cells attained by positive selection from bone marrow and/or from G-CSF mobilized peripheral blood progenitor cells, and ex-vivo expanded $CD34^+$ cells.

8. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x $10^6$ $CD8^+$ $TCR\alpha/\beta^-$ cells per kilogram body weight.

9. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are obtained by magnetic-activated cell sorting.

10. The use of claim 1 or 2, wherein when said surface marker is a T cell surface marker, said unbound cells comprise T cell depleted immature hematopoietic cells.

11. The use of claim 10, wherein said T cell surface marker is selected from the group consisting of CD2, CD3, CD4, CD8 and TCRα/β.

12. The use of claim 1 or 2, wherein when said surface marker is an immature hematopoietic cell surface marker, said bound cells comprise T cell depleted immature hematopoietic cells.

13. The use of claim 12, wherein said immature hematopoietic cell surface marker is selected from the group consisting of CD34, CD33 and CD131.

14. The use of claim 1 or 2, further comprising separating B cells from said T cell depleted immature hematopoietic cells by the use of an antibody that specifically binds to a B cell surface marker.

15. The use of claim 14, wherein said B cell surface marker is selected from the group consisting of CD19 and CD20.

16. The use of claim 1 or 2, wherein said matrix is a ferromagnetic matrix.

17. The use of claim 1 or 2, wherein said matrix comprises spheres of magnetically susceptible or ferromagnetic material.

18. The use of claim 1 or 2, wherein said magnetically responsive agent comprises a superparamagnetic particle.

19. The use of claim 18, wherein said superparamagnetic particle is conjugated to said antibody in combination with an anti-immunoglobulin, an avidin and or anti-hapten-specific microbead.

20. The use of claim 1, 2 or 18, wherein said separating said T cells from said immature hematopoietic cells is effected using a high gradient magnetic separation (HGMS).

21. The use of claim 1 or 2, wherein said separating said T cells from said immature hematopoietic cells is effected using a separation column.

22. The use of claim 1 or 2, wherein said antibody is selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody, an anti-TCRα/β antibody, an anti-CD19 antibody, and an anti-CD20 antibody, an anti-CD21 antibody an anti-CD34 antibody, an anti-CD33 antibody and an anti-CD131 antibody.

23. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

24. The use of claim 23, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to said subject.

25. The use of claim 24, wherein said allogeneic donor is selected from the group consisting of an HLA matched sibling, an HLA matched unrelated donor, an HLA haploidentical related donor and a donor displaying one or more disparate HLA determinants.

26. The use of claim 1 or 2, wherein said subject is a human subject.

27. The use of claim 4, wherein said *in-vivo* T cell debulking is effected by antibodies.

28. The use of claim 27, wherein said antibodies comprise at least one of an anti-CD8 antibody, an anti-CD4 antibody, an anti-thymocyte globulin (ATG) antibody, an anti-CD52 antibody and an anti-CD3 (OKT3) antibody.

29. The use of claim 3, wherein said reduced intensity conditioning comprise a non-myeloablative conditioning protocol.

30. The use of claim 29, wherein said non-myeloablative conditioning comprise at least one of a total body irradiation (TBI), a total lymphoid irradiation (TLI), a chemotherapeutic agent and/or an antibody immunotherapy.

31. The use of claim 30, wherein said TBI comprises a single or fractionated irradiation dose within the range selected from the group consisting of 1-7.5 Gy and 1-3.5 Gy.

32. The use of claim 30, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

33. The use of claim 30, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

34. The use of claim 1 or 2, wherein said concentration of said cyclophosphamide is ~~about~~ 100 – 200 or about 100 mg per kg body weight.

35. The use of claim 1 or 2, wherein said cyclophosphamide is effected in a single dose or in two doses.

36. The use of claim 35, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

37. The use of claim 1, wherein said malignant disease is a hematopoietic cancer.

38. The use of claim 1 or 2, wherein said cell or tissue graft comprises immature hematopoietic cells.

39. The use of claim 1 or 2, wherein said cell or tissue graft is selected from the group consisting of a liver, a pancreas, a spleen, a kidney, a heart, a lung, a skin, an intestine and a lymphoid/hematopoietic tissue or organ.

40. The use of claim 39, wherein said cell or tissue graft is effected prior to, concomitantly with or following said dose of T cell depleted immature hematopoietic cells.

41. The use of claim 39, wherein said cell or tissue graft comprises a co-transplantation of several organs.

42. The use of claim 40, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

43. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising ~~the~~ immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

44. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising ~~the~~ immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

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(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

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45. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising ~~the~~ immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

46. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising ~~the~~ immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

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47. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising ~~the~~ immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

48. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

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(i) adding an antibody to a population of cells comprising ~~the~~ immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

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49. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

50. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting

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of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

51. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δCD25, GITR CD137, latent TGF beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

52. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ CD25, GITR CD137, latent TGF beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a non-malignant disease selected from the group consisting

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of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

53. The use of claim 49, 50, 51 or 52, further comprising a reduced intensity conditioning protocol.

54. The use of claim 49, 50, 51 or 52, further comprising an *in-vivo* T cell debulking protocol.

55. The use of claim 49, 50, 51 or 52, wherein a dose of said T cell depleted immature hematopoietic cells comprises 5 - 40 x $10^6$ CD34+ cells per kilogram body weight.

56. The use of claim 55, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 10 x $10^6$ CD34+ cells per kilogram body weight.

57. The use of claim 49, 50, 51 or 52, wherein said T cell depleted immature hematopoietic cells are selected from the group consisting of T cell depleted bone marrow cells, T cell depleted G-CSF mobilized peripheral blood progenitor cells, T cell depleted cord blood, purified CD34+ cells attained by positive selection from bone marrow and/or from G-CSF mobilized peripheral blood progenitor cells, and ex-vivo expanded $CD34^+$ cells.

58. The use of claim 49, 50, 51 or 52, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x $10^6$ $TCR\alpha/\beta^-$ cells per kilogram body weight.

59. The use of claim 49, 50, 51 or 52, wherein said separating is effected using an antibody.

60. The use of claim 59, wherein said antibody is coupled to a fluorescent dye, a hapten or a magnetic particle.

61. The use of claim 60, wherein said separating is performed using flow-cytometry or magnetic cell sorting.

62. The use of claim 49 or 50, wherein said separating said T cells from said immature hematopoietic cells based on said product secreted by said T cells comprises separating T cells labeled with a secretion product, wherein said T cells have been coupled to a capture moiety that specifically binds a product secreted by said T cells and wherein said T cells have been cultured under conditions wherein the product is secreted and bound to said capture moiety, thereby producing T cells labeled with said secretion product, wherein said T cells are not lysed by said method and wherein said secretion product is labeled with a label moiety.

63. The use of claim 49 or 50, further comprising separating B cells from said T cell depleted immature hematopoietic cells based on a product secreted by said B cells comprising separating B cells labeled with a secretion product, wherein said B cells have been coupled to a capture moiety that specifically binds a product secreted by said B cells and wherein said B cells have been cultured under conditions wherein the product is secreted and bound to said capture moiety, thereby producing B cells labeled with said secretion product, wherein said B cells are not lysed by said method and wherein said secretion product is labeled with a label moiety.

64. The use of claim 62 or 63, wherein said secretion product is a cytokine, antibody or hormone.

65. The use of claim 62 or 63, wherein said secretion product is selected from the group consisting of IFN-γ, IL1, IL2, IL4, IL10, IL12, TGF-β, TNF, GM-CSF and SCF.

66. The use of claim 62 or 63, wherein said capture moiety is coupled to said T cells or B cells through an anchoring moiety.

67. The use of claim 62 or 63, wherein said capture moiety is an antibody or an antigen-binding fragment thereof.

68. The use of claim 67, wherein said antibody is bispecific.

69. The use of claim 67, wherein said antibody is against a T cell or a B cell surface marker.

70. The use of claim 62 or 63, wherein said label moiety is an antibody specific for the secretion product.

71. The use of claim 62 or 63, wherein said label moiety is fluorochromated, magnetizable or comprises magnetic particles.

72. The use of claim 59 or 69, wherein said antibody is selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody, an anti-TCRα/β antibody, an anti-CD19 antibody, an anti-CD20 antibody, an anti-CD21 antibody an anti-CD34 antibody, an anti-CD33 antibody and an anti-CD131 antibody.

73. The use of claim 49, 50, 51 or 52, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

74. The use of claim 73, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to said subject.

75. The use of claim 74, wherein said allogeneic donor is selected from the group consisting of an HLA matched sibling, an HLA matched unrelated donor, an HLA haploidentical related donor and a donor displaying one or more disparate HLA determinants.

76. The use of claim 49, 50, 51 or 52, wherein said subject is a human subject.

77. The use of claim 54, wherein said *in-vivo* T cell debulking is effected by antibodies.

78. The use of claim 77, wherein said antibodies comprise at least one of an anti-CD8 antibody, an anti-CD4 antibody, an anti-thymocyte globulin (ATG) antibody, an anti-CD52 antibody or an anti-CD3 (OKT3) antibody.

79. The use of claim 53, wherein said reduced intensity conditioning protocol comprise a non-myeloablative conditioning protocol.

80. The use of claim 79, wherein said non-myeloablative conditioning comprise at least one of a total body irradiation (TBI), a total lymphoid irradiation (TLI), a chemotherapeutic agent and/or an antibody immunotherapy.

81. The use of claim 80, wherein said TBI comprises a single or fractionated irradiation dose within the range selected from the group consisting of 1-7.5 Gy and 1-3.5 Gy.

82. The use of claim 80, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

83. The use of claim 80, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and an anti-CD3 (OKT3) antibody.

84. The use of claim 49, 50, 51 or 52, wherein said concentration of said cyclophosphamide is ~~about~~ 100 – 200 or about 100 mg per kg body weight.

85. The use of claim 49, 50, 51 or 52, wherein said cyclophosphamide is effected in a single dose or in two doses.

86. The use of claim 85, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

~~87. The use of claim 49, 50, 51 or 52, wherein said subject has a malignant disease.~~

~~88. The use of claim 87, wherein said malignant disease is a hematopoietic cancer.~~

~~89. The use of claim 49, 50, 51 or 52, wherein said subject has a non-malignant disease.~~

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~~90. The use of claim 49, 50, 51 or 52, wherein said cell or tissue graft comprises immature hematopoietic cells.~~

~~91. The use of claim 49, 50, 51 or 52, wherein said cell or tissue graft is selected from the group consisting of a liver, a pancreas, a spleen, a kidney, a heart, a lung, a skin, an intestine and a lymphoid/hematopoietic tissue or organ.~~

~~92. The use of claim 91, wherein said cell or tissue graft is effected prior to, concomitantly with or following said dose of T cell depleted immature hematopoietic cells.~~

~~93. The use of claim 91, wherein said cell or tissue graft comprises a co-transplantation of several organs.~~

~~94. The use of claim 92, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.~~

~~95~~87. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

~~96~~88. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a

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rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

~~97~~89. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of ~~4-1BB, FoxP3, CD154,~~ CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ ~~CD25, GITR, CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b~~; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

~~98~~90. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of ~~4-1BB, FoxP3, CD154,~~ CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ ~~CD25, GITR, CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b~~; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an

autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

~~99~~91. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

~~100~~92. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological

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disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

~~101~~93. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of ~~4-1BB, FoxP3, CD154,~~ CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ~~CD25, GITR, CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b~~; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

~~102~~94. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of ~~4-1BB, FoxP3, CD154,~~ CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ ~~CD25, GITR, CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b~~; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell

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transplantation, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

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~~103~~95. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

~~104~~96. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a

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muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

~~105~~97. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of ~~4-1BB, FoxP3, CD154,~~ CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ~~CD25, GITR, CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b~~; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

~~106~~98. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of ~~4-1BB, FoxP3, CD154,~~ CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ ~~CD25, GITR, CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b~~; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a ~~non-malignant~~ disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic

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disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

99. The use of claim 43, 45, 47, 49, 51, 87, 89, 91, 93, 95 or 97, wherein said malignant disease is a hematopoietic cancer.

100. The use of claim 99, wherein said hematopoietic cancer comprises a leukemia or a lymphoma.

101. The use of claim 2, 44, 46, 48, 50, 52, 88, 90, 92, 94, 96 or 98, wherein said disease is selected from the group consisting of severe combined immunodeficiency syndromes (SCID), sickle cell disease (sickle cell anemia), congenital neutropenia, thrombocytopenia, aplastic anemia, myelodysplastic syndrome, monosomy 7, osteopetrosis, Gaucher's disease, Hurler's disease, metachromatic leukodystrophy, adrenal leukodystrophy, thalassemia, congenital or genetically-determined hematopoietic abnormality, adenosine deaminase (ADA), lupus, autoimmune hepatitis, celiac disease, type I diabetes mellitus, Grave's disease, Guillain-Barr syndrome, Myasthenia gravis, Rheumatoid arthritis, scleroderma and psoriasis.

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102. The use of claim 47, 48, 49, 50, 51, 52, 95, 96, 97 or 98, wherein said cell or tissue graft comprises immature hematopoietic cells.

103. The use of claim 47, 48, 49, 50, 51, 52, 95, 96, 97 or 98, wherein said cell or tissue graft is selected from the group consisting of a liver, a pancreas, a spleen, a kidney, a heart, a lung, a skin, an intestine and a lymphoid/hematopoietic tissue or organ.

104. The use of claim 103, wherein said cell or tissue graft is effected prior to, concomitantly with or following said dose of T cell depleted immature hematopoietic cells.

105. The use of claim 103, wherein said cell or tissue graft comprises a co-transplantation of several organs.

106. The use of claim 104, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

WHAT IS CLAIMED IS:

1. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to the immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

2. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to the immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a non-malignant disease.

3. The use of claim 1 or 2, further comprising a reduced intensity conditioning protocol.

4. The use of claim 1 or 2, further comprising an *in-vivo* T cell debulking protocol.

5. The use of claim 1 or 2, wherein a dose of said T cell depleted immature hematopoietic cells comprises 5 - 40 x $10^6$ CD34+ cells per kilogram body weight.

6. The use of claim 5, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 10 x $10^6$ CD34+ cells per kilogram body weight.

7. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are selected from the group consisting of T cell depleted bone marrow cells, T cell depleted G-CSF mobilized peripheral blood progenitor cells, T cell depleted cord blood, purified CD34+ cells attained by positive selection from bone marrow and/or from G-CSF mobilized peripheral blood progenitor cells, and ex-vivo expanded $CD34^+$ cells.

8. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x $10^6$ $CD8^+$ $TCR\alpha/\beta^-$ cells per kilogram body weight.

9. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are obtained by magnetic-activated cell sorting.

10. The use of claim 1 or 2, wherein when said surface marker is a T cell surface marker, said unbound cells comprise T cell depleted immature hematopoietic cells.

11. The use of claim 10, wherein said T cell surface marker is selected from the group consisting of CD2, CD3, CD4, CD8 and TCRα/β.

12. The use of claim 1 or 2, wherein when said surface marker is an immature hematopoietic cell surface marker, said bound cells comprise T cell depleted immature hematopoietic cells.

13. The use of claim 12, wherein said immature hematopoietic cell surface marker is selected from the group consisting of CD34, CD33 and CD131.

14. The use of claim 1 or 2, further comprising separating B cells from said T cell depleted immature hematopoietic cells by the use of an antibody that specifically binds to a B cell surface marker.

15. The use of claim 14, wherein said B cell surface marker is selected from the group consisting of CD19 and CD20.

16. The use of claim 1 or 2, wherein said matrix is a ferromagnetic matrix.

17. The use of claim 1 or 2, wherein said matrix comprises spheres of magnetically susceptible or ferromagnetic material.

18. The use of claim 1 or 2, wherein said magnetically responsive agent comprises a superparamagnetic particle.

19. The use of claim 18, wherein said superparamagnetic particle is conjugated to said antibody in combination with an anti-immunoglobulin, an avidin and or anti-hapten-specific microbead.

20. The use of claim 1, 2 or 18, wherein said separating said T cells from said immature hematopoietic cells is effected using a high gradient magnetic separation (HGMS).

21. The use of claim 1 or 2, wherein said separating said T cells from said immature hematopoietic cells is effected using a separation column.

22. The use of claim 1 or 2, wherein said antibody is selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody, an anti-TCRα/β antibody, an anti-CD19 antibody, and an anti-CD20 antibody, an anti-CD21 antibody an anti-CD34 antibody, an anti-CD33 antibody and an anti-CD131 antibody.

23. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

24. The use of claim 23, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to said subject.

25. The use of claim 24, wherein said allogeneic donor is selected from the group consisting of an HLA matched sibling, an HLA matched unrelated donor, an HLA

haploidentical related donor and a donor displaying one or more disparate HLA determinants.

26. The use of claim 1 or 2, wherein said subject is a human subject.

27. The use of claim 4, wherein said *in-vivo* T cell debulking is effected by antibodies.

28. The use of claim 27, wherein said antibodies comprise at least one of an anti-CD8 antibody, an anti-CD4 antibody, an anti-thymocyte globulin (ATG) antibody, an anti-CD52 antibody and an anti-CD3 (OKT3) antibody.

29. The use of claim 3, wherein said reduced intensity conditioning comprise a non-myeloablative conditioning protocol.

30. The use of claim 29, wherein said non-myeloablative conditioning comprise at least one of a total body irradiation (TBI), a total lymphoid irradiation (TLI), a chemotherapeutic agent and/or an antibody immunotherapy.

31. The use of claim 30, wherein said TBI comprises a single or fractionated irradiation dose within the range selected from the group consisting of 1-7.5 Gy and 1-3.5 Gy.

32. The use of claim 30, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

33. The use of claim 30, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

34. The use of claim 1 or 2, wherein said concentration of said cyclophosphamide is about 100 – 200 or about 100 mg per kg body weight.

35. The use of claim 1 or 2, wherein said cyclophosphamide is effected in a single dose or in two doses.

36. The use of claim 35, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

37. The use of claim 1, wherein said malignant disease is a hematopoietic cancer.

38. The use of claim 1 or 2, wherein said cell or tissue graft comprises immature hematopoietic cells.

39. The use of claim 1 or 2, wherein said cell or tissue graft is selected from the group consisting of a liver, a pancreas, a spleen, a kidney, a heart, a lung, a skin, an intestine and a lymphoid/hematopoietic tissue or organ.

40. The use of claim 39, wherein said cell or tissue graft is effected prior to, concomitantly with or following said dose of T cell depleted immature hematopoietic cells.

41. The use of claim 39, wherein said cell or tissue graft comprises a co-transplantation of several organs.

42. The use of claim 40, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

43. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than $5 \times 10^5$ CD3+ T

cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to the immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

44. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to the immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a non-malignant disease.

45. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to the immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

46. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells

per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to the immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a non-malignant disease.

47. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to the immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

48. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to the immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a non-malignant disease.

49. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of

a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

50. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a non-malignant disease.

51. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD4, CD8, CD25, GITR CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

52. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based

on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD4, CD8, CD25, GITR CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a non-malignant disease.

53. The use of claim 49, 50, 51 or 52, further comprising a reduced intensity conditioning protocol.

54. The use of claim 49, 50, 51 or 52, further comprising an *in-vivo* T cell debulking protocol.

55. The use of claim 49, 50, 51 or 52, wherein a dose of said T cell depleted immature hematopoietic cells comprises 5 - 40 x $10^6$ CD34+ cells per kilogram body weight.

56. The use of claim 55, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 10 x $10^6$ CD34+ cells per kilogram body weight.

57. The use of claim 49, 50, 51 or 52, wherein said T cell depleted immature hematopoietic cells are selected from the group consisting of T cell depleted bone marrow cells, T cell depleted G-CSF mobilized peripheral blood progenitor cells, T cell depleted cord blood, purified CD34+ cells attained by positive selection from bone marrow and/or from G-CSF mobilized peripheral blood progenitor cells, and ex-vivo expanded $CD34^+$ cells.

58. The use of claim 49, 50, 51 or 52, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x $10^6$ $TCR\alpha/\beta^-$ cells per kilogram body weight.

59. The use of claim 49, 50, 51 or 52, wherein said separating is effected using an antibody.

60. The use of claim 59, wherein said antibody is coupled to a fluorescent dye, a hapten or a magnetic particle.

61. The use of claim 60, wherein said separating is performed using flow-cytometry or magnetic cell sorting.

62. The use of claim 49 or 50, wherein said separating said T cells from said immature hematopoietic cells based on said product secreted by said T cells comprises separating T cells labeled with a secretion product, wherein said T cells have been coupled to a capture moiety that specifically binds a product secreted by said T cells and wherein said T cells have been cultured under conditions wherein the product is secreted and bound to said capture moiety, thereby producing T cells labeled with said secretion product, wherein said T cells are not lysed by said method and wherein said secretion product is labeled with a label moiety.

63. The use of claim 49 or 50, further comprising separating B cells from said T cell depleted immature hematopoietic cells based on a product secreted by said B cells comprising separating B cells labeled with a secretion product, wherein said B cells have been coupled to a capture moiety that specifically binds a product secreted by said B cells and wherein said B cells have been cultured under conditions wherein the product is secreted and bound to said capture moiety, thereby producing B cells labeled with said secretion product, wherein said B cells are not lysed by said method and wherein said secretion product is labeled with a label moiety.

64. The use of claim 62 or 63, wherein said secretion product is a cytokine, antibody or hormone.

65. The use of claim 62 or 63, wherein said secretion product is selected from the group consisting of IFN-γ, IL1, IL2, IL4, IL10, IL12, TGF-β, TNF, GM-CSF and SCF.

66. The use of claim 62 or 63, wherein said capture moiety is coupled to said T cells or B cells through an anchoring moiety.

67. The use of claim 62 or 63, wherein said capture moiety is an antibody or an antigen-binding fragment thereof.

68. The use of claim 67, wherein said antibody is bispecific.

69. The use of claim 67, wherein said antibody is against a T cell or a B cell surface marker.

70. The use of claim 62 or 63, wherein said label moiety is an antibody specific for the secretion product.

71. The use of claim 62 or 63, wherein said label moiety is fluorochromated, magnetizable or comprises magnetic particles.

72. The use of claim 59 or 69, wherein said antibody is selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody, an anti-TCRα/β antibody, an anti-CD19 antibody, an anti-CD20 antibody, an anti-CD21 antibody an anti-CD34 antibody, an anti-CD33 antibody and an anti-CD131 antibody.

73. The use of claim 49, 50, 51 or 52, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

74. The use of claim 73, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to said subject.

75. The use of claim 74, wherein said allogeneic donor is selected from the group consisting of an HLA matched sibling, an HLA matched unrelated donor, an HLA haploidentical related donor and a donor displaying one or more disparate HLA determinants.

76. The use of claim 49, 50, 51 or 52, wherein said subject is a human subject.

77. The use of claim 54, wherein said *in-vivo* T cell debulking is effected by antibodies.

78. The use of claim 77, wherein said antibodies comprise at least one of an anti-CD8 antibody, an anti-CD4 antibody, an anti-thymocyte globulin (ATG) antibody, an anti-CD52 antibody or an anti-CD3 (OKT3) antibody.

79. The use of claim 53, wherein said reduced intensity conditioning protocol comprise a non-myeloablative conditioning protocol.

80. The use of claim 79, wherein said non-myeloablative conditioning comprise at least one of a total body irradiation (TBI), a total lymphoid irradiation (TLI), a chemotherapeutic agent and/or an antibody immunotherapy.

81. The use of claim 80, wherein said TBI comprises a single or fractionated irradiation dose within the range selected from the group consisting of 1-7.5 Gy and 1-3.5 Gy.

82. The use of claim 80, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

83. The use of claim 80, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and an anti-CD3 (OKT3) antibody.

84. The use of claim 49, 50, 51 or 52, wherein said concentration of said cyclophosphamide is about 100 – 200 or about 100 mg per kg body weight.

85. The use of claim 49, 50, 51 or 52, wherein said cyclophosphamide is effected in a single dose or in two doses.

86. The use of claim 85, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

87. The use of claim 49, 50, 51 or 52, wherein said subject has a malignant disease.

88. The use of claim 87, wherein said malignant disease is a hematopoietic cancer.

89. The use of claim 49, 50, 51 or 52, wherein said subject has a non-malignant disease.

90. The use of claim 49, 50, 51 or 52, wherein said cell or tissue graft comprises immature hematopoietic cells.

91. The use of claim 49, 50, 51 or 52, wherein said cell or tissue graft is selected from the group consisting of a liver, a pancreas, a spleen, a kidney, a heart, a lung, a skin, an intestine and a lymphoid/hematopoietic tissue or organ.

92. The use of claim 91, wherein said cell or tissue graft is effected prior to, concomitantly with or following said dose of T cell depleted immature hematopoietic cells.

93. The use of claim 91, wherein said cell or tissue graft comprises a co-transplantation of several organs.

94. The use of claim 92, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

95. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than $5 \times 10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about $5 \times 10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

96. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than $5 \times 10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about $5 \times 10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a non-malignant disease.

97. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD4, CD8, CD25, GITR CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

98. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD4, CD8, CD25, GITR CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a non-malignant disease.

99. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+

cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

100. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than $5 \times 10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about $5 \times 10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a non-malignant disease.

101. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than $5 \times 10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about $5 \times 10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD4, CD8, CD25, GITR CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a

subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

102. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD4, CD8, CD25, GITR CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a non-malignant disease.

103. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

104. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells

comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a non-malignant disease.

105. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD4, CD8, CD25, GITR CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

106. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4-1BB, FoxP3, CD154, CD4, CD8, CD25, GITR CD137, latent TGF-beta (LAP), GARP (LRRC32) and CD121a/b; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically

effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a non-malignant disease.

WHAT IS CLAIMED IS:

1. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

2. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

3. The use of claim 1 or 2, further comprising a reduced intensity conditioning protocol.

4. The use of claim 1 or 2, further comprising an *in-vivo* T cell debulking protocol.

5. The use of claim 1 or 2, wherein a dose of said T cell depleted immature hematopoietic cells comprises 5 - 40 x $10^6$ CD34+ cells per kilogram body weight.

6. The use of claim 5, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 10 x $10^6$ CD34+ cells per kilogram body weight.

7. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are selected from the group consisting of T cell depleted bone marrow cells, T cell depleted G-CSF mobilized peripheral blood progenitor cells, T cell depleted

cord blood, purified CD34+ cells attained by positive selection from bone marrow and/or from G-CSF mobilized peripheral blood progenitor cells, and ex-vivo expanded $CD34^+$ cells.

8. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x $10^6$ $CD8^+$ $TCR\alpha/\beta^-$ cells per kilogram body weight.

9. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are obtained by magnetic-activated cell sorting.

10. The use of claim 1 or 2, wherein when said surface marker is a T cell surface marker, said unbound cells comprise T cell depleted immature hematopoietic cells.

11. The use of claim 10, wherein said T cell surface marker is selected from the group consisting of CD2, CD3, CD4, CD8 and TCRα/β.

12. The use of claim 1 or 2, wherein when said surface marker is an immature hematopoietic cell surface marker, said bound cells comprise T cell depleted immature hematopoietic cells.

13. The use of claim 12, wherein said immature hematopoietic cell surface marker is selected from the group consisting of CD34, CD33 and CD131.

14. The use of claim 1 or 2, further comprising separating B cells from said T cell depleted immature hematopoietic cells by the use of an antibody that specifically binds to a B cell surface marker.

15. The use of claim 14, wherein said B cell surface marker is selected from the group consisting of CD19 and CD20.

16. The use of claim 1 or 2, wherein said matrix is a ferromagnetic matrix.

17. The use of claim 1 or 2, wherein said matrix comprises spheres of magnetically susceptible or ferromagnetic material.

18. The use of claim 1 or 2, wherein said magnetically responsive agent comprises a superparamagnetic particle.

19. The use of claim 18, wherein said superparamagnetic particle is conjugated to said antibody in combination with an anti-immunoglobulin, an avidin and or anti-hapten-specific microbead.

20. The use of claim 1, 2 or 18, wherein said separating said T cells from said immature hematopoietic cells is effected using a high gradient magnetic separation (HGMS).

21. The use of claim 1 or 2, wherein said separating said T cells from said immature hematopoietic cells is effected using a separation column.

22. The use of claim 1 or 2, wherein said antibody is selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody, an anti-TCRα/β antibody, an anti-CD19 antibody, and an anti-CD20 antibody, an anti-CD21 antibody an anti-CD34 antibody, an anti-CD33 antibody and an anti-CD131 antibody.

23. The use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

24. The use of claim 23, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to said subject.

25. The use of claim 24, wherein said allogeneic donor is selected from the group consisting of an HLA matched sibling, an HLA matched unrelated donor, an HLA haploidentical related donor and a donor displaying one or more disparate HLA determinants.

26. The use of claim 1 or 2, wherein said subject is a human subject.

27. The use of claim 4, wherein said *in-vivo* T cell debulking is effected by antibodies.

28. The use of claim 27, wherein said antibodies comprise at least one of an anti-CD8 antibody, an anti-CD4 antibody, an anti-thymocyte globulin (ATG) antibody, an anti-CD52 antibody and an anti-CD3 (OKT3) antibody.

29. The use of claim 3, wherein said reduced intensity conditioning comprise a non-myeloablative conditioning protocol.

30. The use of claim 29, wherein said non-myeloablative conditioning comprise at least one of a total body irradiation (TBI), a total lymphoid irradiation (TLI), a chemotherapeutic agent and/or an antibody immunotherapy.

31. The use of claim 30, wherein said TBI comprises a single or fractionated irradiation dose within the range selected from the group consisting of 1-7.5 Gy and 1-3.5 Gy.

32. The use of claim 30, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

33. The use of claim 30, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

34. The use of claim 1 or 2, wherein said concentration of said cyclophosphamide is 100 – 200 or about 100 mg per kg body weight.

35. The use of claim 1 or 2, wherein said cyclophosphamide is effected in a single dose or in two doses.

36. The use of claim 35, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

37. The use of claim 1, wherein said malignant disease is a hematopoietic cancer.

38. The use of claim 1 or 2, wherein said cell or tissue graft comprises immature hematopoietic cells.

39. The use of claim 1 or 2, wherein said cell or tissue graft is selected from the group consisting of a liver, a pancreas, a spleen, a kidney, a heart, a lung, a skin, an intestine and a lymphoid/hematopoietic tissue or organ.

40. The use of claim 39, wherein said cell or tissue graft is effected prior to, concomitantly with or following said dose of T cell depleted immature hematopoietic cells.

41. The use of claim 39, wherein said cell or tissue graft comprises a co-transplantation of several organs.

42. The use of claim 40, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

43. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

44. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

45. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than $5 \times 10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about $5 \times 10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

46. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

47. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

48. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells, by a method comprising:

(i) adding an antibody to a population of cells comprising immature hematopoietic cells that specifically binds to a surface marker, wherein said antibody is labeled with a magnetically responsive agent;

(ii) immobilizing said population of cells comprising said immature hematopoietic cells specifically bound to said antibody labeled with said magnetically responsive agent in a matrix through a magnetic field;

(iii) washing said matrix to remove unbound cells; and

(iv) removing said magnetic field to elute bound cells from said matrix;

and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

49. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than $5 \times 10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about $5 \times 10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

50. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than $5 \times 10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about $5 \times 10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a disease selected from the group consisting of a genetic

disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

51. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of 4CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

52. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal

disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

53. The use of claim 49, 50, 51 or 52, further comprising a reduced intensity conditioning protocol.

54. The use of claim 49, 50, 51 or 52, further comprising an *in-vivo* T cell debulking protocol.

55. The use of claim 49, 50, 51 or 52, wherein a dose of said T cell depleted immature hematopoietic cells comprises 5 - 40 x $10^6$ CD34+ cells per kilogram body weight.

56. The use of claim 55, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 10 x $10^6$ CD34+ cells per kilogram body weight.

57. The use of claim 49, 50, 51 or 52, wherein said T cell depleted immature hematopoietic cells are selected from the group consisting of T cell depleted bone marrow cells, T cell depleted G-CSF mobilized peripheral blood progenitor cells, T cell depleted cord blood, purified CD34+ cells attained by positive selection from bone marrow and/or from G-CSF mobilized peripheral blood progenitor cells, and ex-vivo expanded $CD34^+$ cells.

58. The use of claim 49, 50, 51 or 52, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x $10^6$ $TCR\alpha/\beta^-$ cells per kilogram body weight.

59. The use of claim 49, 50, 51 or 52, wherein said separating is effected using an antibody.

60. The use of claim 59, wherein said antibody is coupled to a fluorescent dye, a hapten or a magnetic particle.

61. The use of claim 60, wherein said separating is performed using flow-cytometry or magnetic cell sorting.

62. The use of claim 49 or 50, wherein said separating said T cells from said immature hematopoietic cells based on said product secreted by said T cells comprises separating T cells labeled with a secretion product, wherein said T cells have been coupled to a capture moiety that specifically binds a product secreted by said T cells and wherein said T cells have been cultured under conditions wherein the product is secreted and bound to said capture moiety, thereby producing T cells labeled with said secretion product, wherein said T cells are not lysed by said method and wherein said secretion product is labeled with a label moiety.

63. The use of claim 49 or 50, further comprising separating B cells from said T cell depleted immature hematopoietic cells based on a product secreted by said B cells comprising separating B cells labeled with a secretion product, wherein said B cells have been coupled to a capture moiety that specifically binds a product secreted by said B cells and wherein said B cells have been cultured under conditions wherein the product is secreted and bound to said capture moiety, thereby producing B cells labeled with said secretion product, wherein said B cells are not lysed by said method and wherein said secretion product is labeled with a label moiety.

64. The use of claim 62 or 63, wherein said secretion product is a cytokine, antibody or hormone.

65. The use of claim 62 or 63, wherein said secretion product is selected from the group consisting of IFN-γ, IL1, IL2, IL4, IL10, IL12, TGF-β, TNF, GM-CSF and SCF.

66. The use of claim 62 or 63, wherein said capture moiety is coupled to said T cells or B cells through an anchoring moiety.

67. The use of claim 62 or 63, wherein said capture moiety is an antibody or an antigen-binding fragment thereof.

68. The use of claim 67, wherein said antibody is bispecific.

69. The use of claim 67, wherein said antibody is against a T cell or a B cell surface marker.

70. The use of claim 62 or 63, wherein said label moiety is an antibody specific for the secretion product.

71. The use of claim 62 or 63, wherein said label moiety is fluorochromated, magnetizable or comprises magnetic particles.

72. The use of claim 59 or 69, wherein said antibody is selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody, an anti-TCRα/β antibody, an anti-CD19 antibody, an anti-CD20 antibody, an anti-CD21 antibody an anti-CD34 antibody, an anti-CD33 antibody and an anti-CD131 antibody.

73. The use of claim 49, 50, 51 or 52, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

74. The use of claim 73, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to said subject.

75. The use of claim 74, wherein said allogeneic donor is selected from the group consisting of an HLA matched sibling, an HLA matched unrelated donor, an HLA haploidentical related donor and a donor displaying one or more disparate HLA determinants.

76. The use of claim 49, 50, 51 or 52, wherein said subject is a human subject.

77. The use of claim 54, wherein said *in-vivo* T cell debulking is effected by antibodies.

78. The use of claim 77, wherein said antibodies comprise at least one of an anti-CD8 antibody, an anti-CD4 antibody, an anti-thymocyte globulin (ATG) antibody, an anti-CD52 antibody or an anti-CD3 (OKT3) antibody.

79. The use of claim 53, wherein said reduced intensity conditioning protocol comprise a non-myeloablative conditioning protocol.

80. The use of claim 79, wherein said non-myeloablative conditioning comprise at least one of a total body irradiation (TBI), a total lymphoid irradiation (TLI), a chemotherapeutic agent and/or an antibody immunotherapy.

81. The use of claim 80, wherein said TBI comprises a single or fractionated irradiation dose within the range selected from the group consisting of 1-7.5 Gy and 1-3.5 Gy.

82. The use of claim 80, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

83. The use of claim 80, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and an anti-CD3 (OKT3) antibody.

84. The use of claim 49, 50, 51 or 52, wherein said concentration of said cyclophosphamide is 100 – 200 or about 100 mg per kg body weight.

85. The use of claim 49, 50, 51 or 52, wherein said cyclophosphamide is effected in a single dose or in two doses.

86. The use of claim 85, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

87. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

88. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular

disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

89. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of CD2, CD3, CD4, CD8,TCR α/β and TCR γ/δ ; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

90. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of CD2, CD3, CD4, CD8,TCR α/β and TCR γ/δ ; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a conditioned subject in need of an immature hematopoietic cell transplantation, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological

disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

91. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

92. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

93. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a malignant disease.

94. Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent; a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ ; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for treating a subject in need of an immature hematopoietic cell transplantation, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular

disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

95. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

96. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said separating said T cells from said immature hematopoietic cells is effected based on a product secreted by said T cells; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

97. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a malignant disease.

98. Use of a dose of T cell depleted immature hematopoietic cells obtained from a non-syngeneic donor, wherein said T cell depleted immature hematopoietic cells comprise less than 5 x $10^5$ $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5 x $10^6$ CD34+ cells per kilogram body weight, and wherein said T cell depleted immature hematopoietic cells are obtained by separating said T cells from said immature hematopoietic cells based on an expression of at least one surface marker of T cells selected from the group consisting of CD2, CD3, CD4, CD8, TCR α/β and TCR γ/δ ; and a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, for the manufacture of a medicament identified for inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, wherein said subject has a disease selected from the group consisting of a genetic disease or disorder, an autoimmune disease, a hematopoietic disease, a metabolic disorder, a cardiovascular disease, a rheumatoid disease, a glandular disease, a gastrointestinal disease, a cutaneous disease, a hepatic disease, a neurological disease, a muscular disease, a nephric disease, a connective tissue disease, a systemic disease and a disease related to reproduction.

99. The use of claim 43, 45, 47, 49, 51, 87, 89, 91, 93, 95 or 97, wherein said malignant disease is a hematopoietic cancer.

100. The use of claim 99, wherein said hematopoietic cancer comprises a leukemia or a lymphoma.

101. The use of claim 2, 44, 46, 48, 50, 52, 88, 90, 92, 94, 96 or 98, wherein said disease is selected from the group consisting of severe combined immunodeficiency syndromes (SCID), sickle cell disease (sickle cell anemia), congenital neutropenia, thrombocytopenia, aplastic anemia, myelodysplastic syndrome, monosomy 7, osteopetrosis, Gaucher's disease, Hurler's disease, metachromatic leukodystrophy, adrenal leukodystrophy, thalassemia, congenital or genetically-determined hematopoietic abnormality, adenosine deaminase (ADA), lupus, autoimmune hepatitis, celiac disease, type I diabetes mellitus, Grave's disease, Guillain-Barr syndrome, Myasthenia gravis, Rheumatoid arthritis, scleroderma and psoriasis.

102. The use of claim 47, 48, 49, 50, 51, 52, 95, 96, 97 or 98, wherein said cell or tissue graft comprises immature hematopoietic cells.

103. The use of claim 47, 48, 49, 50, 51, 52, 95, 96, 97 or 98, wherein said cell or tissue graft is selected from the group consisting of a liver, a pancreas, a spleen, a kidney, a heart, a lung, a skin, an intestine and a lymphoid/hematopoietic tissue or organ.

104. The use of claim 103, wherein said cell or tissue graft is effected prior to, concomitantly with or following said dose of T cell depleted immature hematopoietic cells.

105. The use of claim 103, wherein said cell or tissue graft comprises a co-transplantation of several organs.

106. The use of claim 104, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.