WHAT IS CLAIMED IS:

1. ~~A method of treating a subject in need of a non-syngeneic cell or tissue graft, the method comprising:~~

~~(a) transplanting into a subject a~~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~~ of the subject~~, and wherein said dose comprises at least about 5 x 10^6 CD34+ cells per kilogram body weight~~ of the subject; ~~, and ~~subsequently~~

~~(b) administering to the subject~~ 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 ~~thereby treating the subject~~.

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 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.

~~2~~3. The ~~method~~ use of claim 1 or 2, further comprising a~~conditioning the subject under~~ reduced intensity conditioning protocol~~prior to step (a)~~.

~~3~~4. The ~~method~~ use of claim 1 or 2, further comprising ~~conditioning the subject with~~an *in-vivo* T cell debulking conditioning protocol ~~prior to step (a)~~.

~~4~~5. The ~~method~~ 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 ~~of the subject~~.

~~5~~6. The ~~method~~ use of claim ~~4~~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 ~~of the subject~~.

~~6~~7. The ~~method~~ 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.

~~7~~8. The ~~method~~ 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 ~~of the subject~~.

~~8~~9. The ~~method~~ use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are obtained by T cell debulking.

~~9~~10. The ~~method~~ use of claim ~~8~~9, wherein said T cell debulking is effected by antibodies.

~~10~~11. The ~~method~~ use of claim ~~9~~10, wherein said antibodies are selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody and an anti-TCRα/β antibody.

~~11~~12. The ~~method~~ use of claim 1 or 2, wherein said immature hematopoietic cells are treated by B cell debulking.

~~12~~13. The ~~method~~ use of claim ~~11~~12, wherein said B cell debulking is effected by an anti-CD19 antibody or by anti-CD20 antibody.

~~13~~14. The ~~method~~ use of claim 1 or 2, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

~~14~~15. The ~~method~~ use of claim ~~13~~14, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to the subject.

~~15~~16. The ~~method~~ use of claim ~~14~~15, 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.

~~16~~17. The ~~method~~ use of claim 1 or 2, wherein the subject is a human subject.

~~17~~18. The ~~method~~ use of claim ~~3~~4, wherein said *in-vivo* T cell debulking is effected by antibodies.

~~18~~19. The ~~method~~ use of claim ~~17~~18, wherein said antibodies comprise an anti-CD8 antibody, an anti-CD4 antibody, or both.

~~19~~20. The ~~method~~ use of claim ~~17~~18, wherein said antibodies comprise anti-thymocyte globulin (ATG) antibodies, anti-CD52 antibodies or anti-CD3 (OKT3) antibodies.

~~20~~21. The ~~method~~ use of claim ~~2~~3, wherein said reduced intensity conditioning comprise a non-myeloablative conditioning.

~~21~~22. The ~~method~~ use of claim ~~20~~21, 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.

~~22~~23. The ~~method~~ use of claim ~~21~~22, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-7.5 Gy.

~~23~~24. The ~~method~~ use of claim ~~22~~23, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-3.5 Gy.

~~24~~25. The ~~method~~ use of claim ~~21~~22, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

~~25~~26. The ~~method~~ use of claim ~~21~~22, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

~~26~~27. The ~~method~~ use of claim 1 or 2, wherein said concentration of said cyclophosphamide is about 100 - 200 mg per kg body weight.

~~27~~28. The ~~method~~ use of claim ~~26~~27, wherein said concentration of said cyclophosphamide is about 100 mg per kg body weight.

~~28~~29. The ~~method~~ use of claim 1 or 2, wherein said cyclophosphamide is ~~administered~~ effected in a single dose.

~~29~~30. The ~~method~~ use of claim 1 or 2, wherein said cyclophosphamide is ~~administered~~ effected in two doses.

~~30~~31. The ~~method~~ use of claim ~~29~~30, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

~~31. The method of claim 29, wherein each of said two doses is administered on days 3 and 4 following step (a).~~

~~32. The method of claim 1, wherein the subject has a malignant disease.~~

~~33~~32. The ~~method~~ use of claim ~~32~~1, wherein said malignant disease is a hematopoietic cancer.

~~34~~33. The ~~method~~ use of claim ~~33~~32, wherein said hematopoietic cancer comprises a leukemia or lymphoma.

~~35~~34. The ~~method~~ use of claim ~~33~~32, wherein said hematopoietic cancer is selected from the group consisting of acute lymphoblastic leukemia (ALL), acute myelocytic leukemia (AML), acute nonlymphoblastic leukemia (ANLL), Chronic lymphocytic leukemia (CLL), chronic myelocytic leukemia (CML), Hodgkin's Lymphoma, non- Hodgkin's Lymphoma, Extranodal natural killer/T-cell lymphoma, Cutaneous T-cell lymphoma, Enteropathy type T-cell lymphoma, Angioimmunoblastic T-cell lymphoma, Anaplastic large T/null-cell lymphoma, Subcutaneous panniculitis-like T-cell lymphoma, Unspecified T-cell lymphoma, Diffuse large B-cell lymphoma, B-cell chronic lymphocytic leukemia (B-CLL)/chronic lymphoid leukemia (CLL), Chronic lymphocytic leukemia/small lymphocytic lymphoma, Extranodal marginal zone B-cell lymphomas - mucosa-associated lymphoid tissue lymphomas, Follicular lymphoma, Mantle cell lymphoma, Nodal marginal zone B-cell lymphoma, Burkitt lymphoma, Hairy cell leukemia, Primary central nervous system lymphoma, Splenic marginal zone B-cell lymphoma, Lymphoplasmocytic lymphoma, Primary mediastinal B-cell lymphoma and multiple myeloma.

~~36. The method of claim 1, wherein the subject has a non-malignant disease.~~

~~37~~35. The ~~method~~ use of claim ~~36~~2, wherein said non-malignant disease is a genetic disease or disorder, an autoimmune disease or a metabolic disorder.

~~38~~36. The ~~method~~ use of claim ~~36~~2, wherein said non-malignant disease is selected from the group consisting of sickle cells disease, a congenital neutropenia, a thrombocytopenia, an aplastic anemia, a myelodysplastic syndrome, a monosomy 7, an osteopetrosis, a Gaucher's disease, a Hurler's disease, a metachromatic leukodystrophy, an adrenal leukodystrophy, a thalassemia, a congenital or genetically-determined hematopoietic abnormality, lupus, autoimmune hepatitis, celiac disease, type I diabetes mellitus, Grave's disease, Guillain-Barr syndrome, Myasthenia gravis, Rheumatoid arthritis, scleroderma and psoriasis.

~~39~~37. The ~~method~~ use of claim 1 or 2, wherein said cell or tissue graft comprises immature hematopoietic cells.

~~40~~38. The ~~method~~ 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.

~~41. The method of claim 40, wherein said cell or tissue graft is transplanted into the subject prior to, concomitantly with or following said transplanting said dose of T cell depleted immature hematopoietic cells into said subject.~~

~~42~~39. The ~~method~~ use of claim ~~40~~38, wherein said cell or tissue graft comprises a co-transplantation of several organs.

~~43~~40. The ~~method~~ use of claim ~~41~~1 or 2, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

~~44~~41. ~~A method of treating a subject in need of an immature hematopoietic cell transplantation, the method comprising:~~

~~(a) transplanting into a conditioned subject~~ 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 ~~of the subject~~, and wherein said dose comprises at least about 5 x 10^6 CD34+ cells per kilogram body weight ~~of the subject;~~ , and ~~subsequently~~

~~(b) administering to the subject~~ 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, and wherein said subject has a malignant disease ~~thereby treating the subject~~.

42. 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 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, and wherein said subject has a non-malignant disease .

~~45~~43. The ~~method~~ use of claim ~~44~~41 or 42, wherein said conditioned subject has been conditioned under reduced intensity conditioning protocol.

~~46~~44. The ~~method~~ use of claim ~~45~~43, wherein said reduced intensity conditioning is effected 1-10 days ~~prior to said transplanting~~.

~~47~~45. The ~~method~~ use of claim ~~45~~43, wherein said reduced intensity conditioning comprises a non-myeloablative conditioning protocol.

~~48~~46. The ~~method~~ use of claim ~~47~~45, wherein said non-myeloablative conditioning protocol comprises at least one of a total body irradiation (TBI), a total lymphoid irradiation (TLI), a chemotherapeutic agent and/or an antibody immunotherapy.

~~49~~47. The ~~method~~ use of claim ~~48~~46, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-7.5 Gy.

~~50~~48. The ~~method~~ use of claim ~~49~~47, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-3.5 Gy.

~~51~~49. The ~~method~~ use of claim ~~48~~46, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

~~52~~50. The ~~method~~ use of claim ~~48~~46, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

~~53~~51. The ~~method~~ use of claim ~~44~~41 or 42, wherein said conditioned subject has been conditioned with *in-vivo* T cell debulking.

~~54~~52. The ~~method~~ use of claim ~~53~~51, wherein said *in-vivo* T cell debulking is effected 4-7 days ~~prior to said transplanting~~.

~~55~~53. The ~~method~~ use of claim ~~53~~51, wherein said *in-vivo* T cell debulking is effected by antibodies.

~~56~~54. The ~~method~~ use of claim ~~55~~53, wherein said antibodies comprise an anti-CD8 antibody, an anti-CD4 antibody or both.

~~57~~55. The ~~method~~ use of claim ~~55~~53, wherein said antibodies comprise anti-thymocyte globulin (ATG) antibodies, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

~~58~~56. The ~~method~~ use of claim ~~44~~41 or 42, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 5 - 40 x 10^6 CD34+ cells per kilogram body weight ~~of the subject~~.

~~59~~57. The ~~method~~ use of claim ~~58~~56, 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 ~~of the subject~~.

~~60~~58. The ~~method~~ use of claim ~~44~~41 or 42, 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.

~~61~~59. The ~~method~~ use of claim ~~44~~41 or 42, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x 10^6 $CD8^+$ $TCR\alpha/\beta^-$ cells per kilogram body weight ~~of the subject~~.

~~62~~60. The ~~method~~ use of claim ~~44~~41 or 42, wherein said T cell depleted immature hematopoietic cells are obtained by T cell debulking.

~~63~~61. The ~~method~~ use of claim ~~62~~60, wherein said T cell debulking is effected by antibodies.

~~64~~62. The ~~method~~ use of claim ~~63~~61, wherein said antibodies are selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody and an anti-TCRα/β antibody.

~~65~~63. The ~~method~~ use of claim ~~44~~41 or 42, wherein said immature hematopoietic cells are treated by B cell debulking.

~~66~~64. The ~~method~~ use of claim ~~65~~63, wherein said *B* cell debulking is effected by an anti-CD19 antibody or anti-CD20 antibody.

~~67~~65. The ~~method~~ use of claim ~~44~~41 or 42, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

~~68~~66. The ~~method~~ use of claim ~~63~~61, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to the subject.

~~69~~67. The ~~method~~ use of claim ~~44~~41 or 42, wherein the subject is a human subject.

~~70~~68. The ~~method~~ use of claim ~~44~~41 or 42, wherein said concentration of said cyclophosphamide is about 100 - 200 mg per kg body weight.

~~71~~69. The ~~method~~ use of claim ~~70~~68, wherein said concentration of said cyclophosphamide is about 100 mg per kg body weight.

~~72~~70. The ~~method~~ use of claim ~~44~~41 or 42, wherein said cyclophosphamide is ~~administered~~ effected in a single dose.

~~73~~71. The ~~method~~ use of claim ~~44~~41 or 42, wherein said cyclophosphamide is ~~administered~~ effected in two doses.

~~74~~72. The ~~method~~ use of claim ~~73~~71, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

~~75. The method of claim 73, wherein each of said two doses is administered on days 3 and 4 following step (a).~~

~~76~~73. ~~A method of treating a subject in need of an immature hematopoietic cell transplantation, the method comprising:~~

~~(a) conditioning a subject under~~ Use of a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent;

~~(b) transplanting into the subject~~ 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 ~~of the subject~~, and wherein said dose comprises at least about 5 x 10^6 CD34+ cells per kilogram body weight ~~of the subject~~; and ~~subsequently~~

~~(c) administering to the subject~~ 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, and wherein said subject has a malignant disease~~thereby treating the subject~~.

74. 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 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, and wherein said subject has a non-malignant disease.

~~77~~75. The ~~method~~ use of claim ~~76~~73 or 74, wherein said TBI comprises a single or fractionated irradiation dose within the range of 2 Gy.

~~78. The method of claim 76, wherein said TBI is effected in a single dose 2 days prior to step (b).~~

~~79~~76. The ~~method~~ use of claim ~~76~~73 or 74, wherein said chemotherapeutic agent comprises Fludarabine.

~~80~~77. The ~~method~~ use of claim ~~79~~76, wherein said Fludarabine is effected at a dose of 30 mg/m^2/day.

~~81. The method of claim 79, wherein said Fludarabine is administered daily on days 3 to 7 prior to step (b).~~

~~82~~78. The ~~method~~ use of claim ~~76~~73 or 74, 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 ~~of the subject~~.

~~83~~79. The ~~method~~ use of claim ~~76~~73 or 74, wherein said T cell depleted immature hematopoietic cells comprise T cell depleted G-CSF mobilized peripheral blood progenitor cells.

~~84~~80. The ~~method~~ use of claim ~~76~~73 or 74, wherein said T cell depleted immature hematopoietic cells are obtained by T cell debulking.

~~85~~81. The ~~method~~ use of claim ~~76~~73 or 74, wherein said T cell debulking is effected by antibodies.

~~86~~82. The ~~method~~ use of claim ~~85~~81, wherein said antibodies comprise an anti-CD3 antibody.

~~87~~83. The ~~method~~ use of claim ~~76~~73 or 74, wherein said immature hematopoietic cells are treated by B cell debulking.

~~88~~84. The ~~method~~ use or use of claim ~~87~~83, wherein said B cell debulking is effected by an anti-CD19 antibody or anti-CD20 antibody.

~~89~~85. The ~~method~~ use of claim ~~76~~73 or 74, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

~~90~~86. The ~~method~~ use of claim ~~89~~85, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to the subject.

~~91~~87. The ~~method~~ use of claim ~~76~~73 or 74, wherein said cyclophosphamide is ~~administered~~ effected in two doses.

~~92~~88. The ~~method~~ use of claim ~~91~~87, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

~~93. The method of claim 91, wherein each of said two doses is administered on days 3 and 4 following step (b).~~

~~94~~89. ~~A method of inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, the method comprising:~~

~~(a) transplanting into a subject~~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 ~~of the subject~~, and wherein said dose comprises at least about 5 x 10^6 CD34+ cells per kilogram body weight ~~of the subject~~; and ~~subsequently~~

~~(b) administering to the subject~~ 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~~thereby inducing donor specific tolerance in the subject~~.

90. 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 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.

~~95~~91. The ~~method~~ use of claim ~~94~~89 or 90, further comprising ~~conditioning the subject under~~ a reduced intensity conditioning protocol ~~prior to step (a)~~.

~~96~~92. The ~~method~~ use of claim ~~94~~89, 90 ~~or~~ or ~~95~~91, further comprising ~~conditioning the subject with~~an *in-vivo* T cell debulking conditioning protocol ~~prior to step (a)~~.

~~97~~93. The ~~method~~ use of claim ~~94~~89 or 90, wherein said cell or tissue graft comprises immature hematopoietic cells.

~~98~~94. The ~~method~~ use of claim ~~94~~89 or 90, 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.

~~99. The method of claim 94, wherein said cell or tissue graft is transplanted into the subject following said transplanting said dose of T cell depleted immature hematopoietic cells.~~

~~100~~95. The ~~method~~ use of claim ~~94~~89 or 90, wherein said cell or tissue graft comprises a co-transplantation of several organs.

~~101~~96. The ~~method~~ use of claim ~~94~~89 or 90, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

~~102~~97. The ~~method~~ use of claim ~~94~~89 or 90, wherein said T cell depleted immature hematopoietic cells comprise less than 1×10^6 $CD8^+$ TCRα/β negative cells per kilogram body weight ~~of the subject~~.

WHAT IS CLAIMED IS:

1. A method of treating a subject in need of a non-syngeneic cell or tissue graft, the method comprising:

(a) transplanting into a subject 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 of the subject, and wherein said dose comprises at least about 5 x 10^6 CD34+ cells per kilogram body weight of the subject; and subsequently

(b) administering to the subject a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, thereby treating the subject.

2. The method of claim 1, further comprising conditioning the subject under reduced intensity conditioning prior to step (a).

3. The method of claim 1, further comprising conditioning the subject with *in-vivo* T cell debulking prior to step (a).

4. The method of claim 1, wherein a dose of said T cell depleted immature hematopoietic cells comprises 5 - 40 x 10^6 CD34+ cells per kilogram body weight of the subject.

5. The method of claim 4, 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 of the subject.

6. The method of claim 1, 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.

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

8. The method of claim 1, wherein said T cell depleted immature hematopoietic cells are obtained by T cell debulking.

9. The method of claim 8, wherein said T cell debulking is effected by antibodies.

10. The method of claim 9, wherein said antibodies are selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody and an anti-TCRα/β antibody.

11. The method of claim 1, wherein said immature hematopoietic cells are treated by B cell debulking.

12. The method of claim 11, wherein said B cell debulking is effected by an anti-CD19 antibody or by anti-CD20 antibody.

13. The method of claim 1, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

14. The method of claim 13, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to the subject.

15. The method of claim 14, 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.

16. The method of claim 1, wherein the subject is a human subject.

17. The method of claim 3, wherein said *in-vivo* T cell debulking is effected by antibodies.

18. The method of claim 17, wherein said antibodies comprise an anti-CD8 antibody, an anti-CD4 antibody, or both.

19. The method of claim 17, wherein said antibodies comprise anti-thymocyte globulin (ATG) antibodies, anti-CD52 antibodies or anti-CD3 (OKT3) antibodies.

20. The method of claim 2, wherein said reduced intensity conditioning comprise a non-myeloablative conditioning.

21. The method of claim 20, 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.

22. The method of claim 21, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-7.5 Gy.

23. The method of claim 22, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-3.5 Gy.

24. The method of claim 21, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

25. The method of claim 21, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

26. The method of claim 1, wherein said concentration of said cyclophosphamide is about 100 - 200 mg per kg body weight.

27. The method of claim 26, wherein said concentration of said cyclophosphamide is about 100 mg per kg body weight.

28. The method of claim 1, wherein said cyclophosphamide is administered in a single dose.

29. The method of claim 1, wherein said cyclophosphamide is administered in two doses.

30. The method of claim 29, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

31. The method of claim 29, wherein each of said two doses is administered on days 3 and 4 following step (a).

32. The method of claim 1, wherein the subject has a malignant disease.

33. The method of claim 32, wherein said malignant disease is a hematopoietic cancer.

34. The method of claim 33, wherein said hematopoietic cancer comprises a leukemia or lymphoma.

35. The method of claim 33, wherein said hematopoietic cancer is selected from the group consisting of acute lymphoblastic leukemia (ALL), acute myelocytic

leukemia (AML), acute nonlymphoblastic leukemia (ANLL), Chronic lymphocytic leukemia (CLL), chronic myelocytic leukemia (CML), Hodgkin's Lymphoma, non-Hodgkin's Lymphoma, Extranodal natural killer/T-cell lymphoma, Cutaneous T-cell lymphoma, Enteropathy type T-cell lymphoma, Angioimmunoblastic T-cell lymphoma, Anaplastic large T/null-cell lymphoma, Subcutaneous panniculitis-like T-cell lymphoma, Unspecified T-cell lymphoma, Diffuse large B-cell lymphoma, B-cell chronic lymphocytic leukemia (B-CLL)/chronic lymphoid leukemia (CLL), Chronic lymphocytic leukemia/small lymphocytic lymphoma, Extranodal marginal zone B-cell lymphomas - mucosa-associated lymphoid tissue lymphomas, Follicular lymphoma, Mantle cell lymphoma, Nodal marginal zone B-cell lymphoma, Burkitt lymphoma, Hairy cell leukemia, Primary central nervous system lymphoma, Splenic marginal zone B-cell lymphoma, Lymphoplasmocytic lymphoma, Primary mediastinal B-cell lymphoma and multiple myeloma.

36. The method of claim 1, wherein the subject has a non-malignant disease.

37. The method of claim 36, wherein said non-malignant disease is a genetic disease or disorder, an autoimmune disease or a metabolic disorder.

38. The method of claim 36, wherein said non-malignant disease is selected from the group consisting of sickle cells disease, a congenital neutropenia, a thrombocytopenia, an aplastic anemia, a myelodysplastic syndrome, a monosomy 7, an osteopetrosis, a Gaucher's disease, a Hurler's disease, a metachromatic leukodystrophy, an adrenal leukodystrophy, a thalassemia, a congenital or genetically-determined hematopoietic abnormality, lupus, autoimmune hepatitis, celiac disease, type I diabetes mellitus, Grave's disease, Guillain-Barr syndrome, Myasthenia gravis, Rheumatoid arthritis, scleroderma and psoriasis.

39. The method of claim 1, wherein said cell or tissue graft comprises immature hematopoietic cells.

40. The method of claim 1, 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.

41. The method of claim 40, wherein said cell or tissue graft is transplanted into the subject prior to, concomitantly with or following said transplanting said dose of T cell depleted immature hematopoietic cells into said subject.

42. The method of claim 40, wherein said cell or tissue graft comprises a co-transplantation of several organs.

43. The method of claim 41, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

44. A method of treating a subject in need of an immature hematopoietic cell transplantation, the method comprising:

(a) transplanting into a conditioned subject a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5×10^5 CD3+ T cells per kilogram body weight of the subject, and wherein said dose comprises at least about 5×10^6 CD34+ cells per kilogram body weight of the subject; and subsequently

(b) administering to the subject a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, thereby treating the subject.

45. The method of claim 44, wherein said conditioned subject has been conditioned under reduced intensity conditioning.

46. The method of claim 45, wherein said reduced intensity conditioning is effected 1-10 days prior to said transplanting.

47. The method of claim 45, wherein said reduced intensity conditioning comprises a non-myeloablative conditioning protocol.

48. The method of claim 47, wherein said non-myeloablative conditioning protocol comprises at least one of a total body irradiation (TBI), a total lymphoid irradiation (TLI), a chemotherapeutic agent and/or an antibody immunotherapy.

49. The method of claim 48, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-7.5 Gy.

50. The method of claim 49, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-3.5 Gy.

51. The method of claim 48, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

52. The method of claim 48, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

53. The method of claim 44, wherein said conditioned subject has been conditioned with *in-vivo* T cell debulking.

54. The method of claim 53, wherein said *in-vivo* T cell debulking is effected 4-7 days prior to said transplanting.

55. The method of claim 53, wherein said *in-vivo* T cell debulking is effected by antibodies.

56. The method of claim 55, wherein said antibodies comprise an anti-CD8 antibody, an anti-CD4 antibody or both.

57. The method of claim 55, wherein said antibodies comprise anti-thymocyte globulin (ATG) antibodies, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

58. The method of claim 44, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 5 - 40 x 10^6 CD34+ cells per kilogram body weight of the subject.

59. The method of claim 58, 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 of the subject.

60. The method of claim 44, 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.

61. The method of claim 44, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x 10^6 $CD8^+$ $TCR\alpha/\beta^-$ cells per kilogram body weight of the subject.

62. The method of claim 44, wherein said T cell depleted immature hematopoietic cells are obtained by T cell debulking.

63. The method of claim 62, wherein said T cell debulking is effected by antibodies.

64. The method of claim 63, wherein said antibodies are selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody and an anti-TCRα/β antibody.

65. The method of claim 44, wherein said immature hematopoietic cells are treated by B cell debulking.

66. The method of claim 65, wherein said *B* cell debulking is effected by an anti-CD19 antibody or anti-CD20 antibody.

67. The method of claim 44, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

68. The method of claim 63, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to the subject.

69. The method of claim 44, wherein the subject is a human subject.

70. The method of claim 44, wherein said concentration of said cyclophosphamide is about 100 - 200 mg per kg body weight.

71. The method of claim 70, wherein said concentration of said cyclophosphamide is about 100 mg per kg body weight.

72. The method of claim 44, wherein said cyclophosphamide is administered in a single dose.

73. The method of claim 44, wherein said cyclophosphamide is administered in two doses.

74. The method of claim 73, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

75. The method of claim 73, wherein each of said two doses is administered on days 3 and 4 following step (a).

76. A method of treating a subject in need of an immature hematopoietic cell transplantation, the method comprising:

(a) conditioning a subject under a reduced intensity conditioning protocol, wherein said reduced intensity conditioning comprises a total body irradiation (TBI) and a chemotherapeutic agent;

(b) transplanting into the subject a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5×10^5 CD3+ T cells per kilogram body weight of the subject, and wherein said dose comprises at least about 5×10^6 CD34+ cells per kilogram body weight of the subject; and subsequently

(c) administering to the subject a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, thereby treating the subject.

77. The method of claim 76, wherein said TBI comprises a single or fractionated irradiation dose within the range of 2 Gy.

78. The method of claim 76, wherein said TBI is effected in a single dose 2 days prior to step (b).

79. The method of claim 76, wherein said chemotherapeutic agent comprises Fludarabine.

80. The method of claim 79, wherein said Fludarabine is effected at a dose of 30 mg/m^2/day.

81. The method of claim 79, wherein said Fludarabine is administered daily on days 3 to 7 prior to step (b).

82. The method of claim 76, 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 of the subject.

83. The method of claim 76, wherein said T cell depleted immature hematopoietic cells comprise T cell depleted G-CSF mobilized peripheral blood progenitor cells.

84. The method of claim 76, wherein said T cell depleted immature hematopoietic cells are obtained by T cell debulking.

85. The method of claim 76, wherein said T cell debulking is effected by antibodies.

86. The method of claim 85, wherein said antibodies comprise an anti-CD3 antibody.

87. The method of claim 76, wherein said immature hematopoietic cells are treated by B cell debulking.

88. The method or use of claim 87, wherein said B cell debulking is effected by an anti-CD19 antibody or anti-CD20 antibody.

89. The method of claim 76, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

90. The method of claim 89, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to the subject.

91. The method of claim 76, wherein said cyclophosphamide is administered in two doses.

92. The method of claim 91, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

93. The method of claim 91, wherein each of said two doses is administered on days 3 and 4 following step (b).

94. A method of inducing donor specific tolerance in a subject in need of a non-syngeneic cell or tissue graft, the method comprising:

(a) transplanting into a subject 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 5×10^5 $CD3^+$ T cells per kilogram body weight of the subject, and wherein said dose comprises at least about 5×10^6 CD34+ cells per kilogram body weight of the subject; and subsequently

(b) administering to the subject a therapeutically effective amount of cyclophosphamide, wherein said therapeutically effective amount comprises 25-200 mg per kilogram body weight, thereby inducing donor specific tolerance in the subject.

95. The method of claim 94, further comprising conditioning the subject under reduced intensity conditioning prior to step (a).

96. The method of claim 94 or 95, further comprising conditioning the subject with *in-vivo* T cell debulking prior to step (a).

97. The method of claim 94, wherein said cell or tissue graft comprises immature hematopoietic cells.

98. The method of claim 94, 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.

99. The method of claim 94, wherein said cell or tissue graft is transplanted into the subject following said transplanting said dose of T cell depleted immature hematopoietic cells.

100. The method of claim 94, wherein said cell or tissue graft comprises a co-transplantation of several organs.

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

102. The method of claim 94, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x 10^6 $CD8^+$ TCRα/β negative cells per kilogram body weight of the subject.

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 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 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 conditioning 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 T cell debulking.

10. The use of claim 9, wherein said T cell debulking is effected by antibodies.

11. The use of claim 10, wherein said antibodies are selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody and an anti-TCRα/β antibody.

12. The use of claim 1 or 2, wherein said immature hematopoietic cells are treated by B cell debulking.

13. The use of claim 12, wherein said B cell debulking is effected by an anti-CD19 antibody or by anti-CD20 antibody.

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

15. The use of claim 14, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to the subject.

16. The use of claim 15, 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.

17. The use of claim 1 or 2, wherein the subject is a human subject.

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

19. The use of claim 18, wherein said antibodies comprise an anti-CD8 antibody, an anti-CD4 antibody, or both.

20. The use of claim 18, wherein said antibodies comprise anti-thymocyte globulin (ATG) antibodies, anti-CD52 antibodies or anti-CD3 (OKT3) antibodies.

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

22. The use of claim 21, 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.

23. The use of claim 22, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-7.5 Gy.

24. The use of claim 23, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-3.5 Gy.

25. The use of claim 22, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

26. The use of claim 22, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

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

28. The use of claim 27, wherein said concentration of said cyclophosphamide is about 100 mg per kg body weight.

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

30. The use of claim 1 or 2, wherein said cyclophosphamide is effected in two doses.

31. The use of claim 30, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

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

33. The use of claim 32, wherein said hematopoietic cancer comprises a leukemia or lymphoma.

34. The use of claim 32, wherein said hematopoietic cancer is selected from the group consisting of acute lymphoblastic leukemia (ALL), acute myelocytic leukemia (AML), acute nonlymphoblastic leukemia (ANLL), Chronic lymphocytic leukemia (CLL), chronic myelocytic leukemia (CML), Hodgkin's Lymphoma, non- Hodgkin's Lymphoma, Extranodal natural killer/T-cell lymphoma, Cutaneous T-cell lymphoma, Enteropathy type T-cell lymphoma, Angioimmunoblastic T-cell lymphoma, Anaplastic large T/null-cell lymphoma, Subcutaneous panniculitis-like T-cell lymphoma, Unspecified T-cell lymphoma, Diffuse large B-cell lymphoma, B-cell chronic lymphocytic leukemia (B-CLL)/chronic lymphoid leukemia (CLL), Chronic lymphocytic leukemia/small lymphocytic lymphoma, Extranodal marginal zone B-cell lymphomas - mucosa-associated lymphoid tissue lymphomas, Follicular lymphoma, Mantle cell lymphoma, Nodal marginal zone B-cell lymphoma, Burkitt lymphoma, Hairy cell leukemia, Primary central nervous system lymphoma, Splenic marginal zone B-cell lymphoma, Lymphoplasmocytic lymphoma, Primary mediastinal B-cell lymphoma and multiple myeloma.

35. The use of claim 2, wherein said non-malignant disease is a genetic disease or disorder, an autoimmune disease or a metabolic disorder.

36. The use of claim 2, wherein said non-malignant disease is selected from the group consisting of sickle cells disease, a congenital neutropenia, a thrombocytopenia, an aplastic anemia, a myelodysplastic syndrome, a monosomy 7, an osteopetrosis, a Gaucher's disease, a Hurler's disease, a metachromatic leukodystrophy, an adrenal leukodystrophy, a thalassemia, a congenital or genetically-determined hematopoietic abnormality, lupus, autoimmune hepatitis, celiac disease, type I diabetes mellitus, Grave's disease, Guillain-Barr syndrome, Myasthenia gravis, Rheumatoid arthritis, scleroderma and psoriasis.

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

38. 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.

39. The use of claim 38, wherein said cell or tissue graft comprises a co-transplantation of several organs.

40. The use of claim 1 or 2, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

41. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5×10^5 CD3+ T cells per kilogram body weight , and wherein said dose comprises at least about 5×10^6 CD34+ cells per kilogram body weight , 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, and wherein said subject has a malignant disease .

42. Use of a dose of T cell depleted immature hematopoietic cells, wherein said T cell depleted immature hematopoietic cells comprise less than 5×10^5 CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5×10^6 CD34+ cells per kilogram body weight, 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, and wherein said subject has a non-malignant disease .

43. The use of claim 41 or 42, wherein said conditioned subject has been conditioned under reduced intensity conditioning protocol.

44. The use of claim 43, wherein said reduced intensity conditioning is effected 1-10 days.

45. The use of claim 43, wherein said reduced intensity conditioning comprises a non-myeloablative conditioning protocol.

46. The use of claim 45, wherein said non-myeloablative conditioning protocol comprises at least one of a total body irradiation (TBI), a total lymphoid irradiation (TLI), a chemotherapeutic agent and/or an antibody immunotherapy.

47. The use of claim 46, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-7.5 Gy.

48. The use of claim 47, wherein said TBI comprises a single or fractionated irradiation dose within the range of 1-3.5 Gy.

49. The use of claim 46, wherein said chemotherapeutic agent comprises at least one of Busulfan, Fludarabine, Melphalan and Thiotepa.

50. The use of claim 46, wherein said antibody comprises at least one of an anti-CD52 antibody, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

51. The use of claim 41 or 42, wherein said conditioned subject has been conditioned with *in-vivo* T cell debulking.

52. The use of claim 51, wherein said *in-vivo* T cell debulking is effected 4-7 days.

53. The use of claim 51, wherein said *in-vivo* T cell debulking is effected by antibodies.

54. The use of claim 53, wherein said antibodies comprise an anti-CD8 antibody, an anti-CD4 antibody or both.

55. The use of claim 53, wherein said antibodies comprise anti-thymocyte globulin (ATG) antibodies, an anti-thymocyte globulin (ATG) antibody and anti-CD3 (OKT3) antibody.

56. The use of claim 41 or 42, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 5 - 40 x 10^6 CD34+ cells per kilogram body weight.

57. The use of claim 56, 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.

58. The use of claim 41 or 42, 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.

59. The use of claim 41 or 42, wherein said T cell depleted immature hematopoietic cells comprise less than 1 x 10^6 $CD8^+$ $TCR\alpha/\beta^-$ cells per kilogram body weight.

60. The use of claim 41 or 42, wherein said T cell depleted immature hematopoietic cells are obtained by T cell debulking.

61. The use of claim 60, wherein said T cell debulking is effected by antibodies.

62. The use of claim 61, wherein said antibodies are selected from the group consisting of an anti-CD8 antibody, an anti-CD4 antibody, an anti-CD3 antibody, an anti-CD2 antibody and an anti-TCRα/β antibody.

63. The use of claim 41 or 42, wherein said immature hematopoietic cells are treated by B cell debulking.

64. The use of claim 63, wherein said *B* cell debulking is effected by an anti-CD19 antibody or anti-CD20 antibody.

65. The use of claim 41 or 42, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

66. The use of claim 61, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to the subject.

67. The use of claim 41 or 42, wherein the subject is a human subject.

68. The use of claim 41 or 42, wherein said concentration of said cyclophosphamide is about 100 - 200 mg per kg body weight.

69. The use of claim 68, wherein said concentration of said cyclophosphamide is about 100 mg per kg body weight.

70. The use of claim 41 or 42, wherein said cyclophosphamide is effected in a single dose.

71. The use of claim 41 or 42, wherein said cyclophosphamide is effected in two doses.

72. The use of claim 71, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

73. 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 5×10^5 CD3+ T cells per kilogram body weight , and wherein said dose comprises at least about 5×10^6 CD34+ cells per kilogram body weight ; 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, and wherein said subject has a malignant disease.

74. 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 5×10^5 CD3+ T cells per kilogram body weight, and wherein said dose comprises at least about 5×10^6 CD34+ cells per kilogram body weight; 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, and wherein said subject has a non-malignant disease.

75. The use of claim 73 or 74, wherein said TBI comprises a single or fractionated irradiation dose within the range of 2 Gy.

76. The use of claim 73 or 74, wherein said chemotherapeutic agent comprises Fludarabine.

77. The use of claim 76, wherein said Fludarabine is effected at a dose of 30 $mg/m^2/day$.

78. The use of claim 73 or 74, wherein a dose of said T cell depleted immature hematopoietic cells comprises at least about 10×10^6 CD34+ cells per kilogram body weight .

79. The use of claim 73 or 74, wherein said T cell depleted immature hematopoietic cells comprise T cell depleted G-CSF mobilized peripheral blood progenitor cells.

80. The use of claim 73 or 74, wherein said T cell depleted immature hematopoietic cells are obtained by T cell debulking.

81. The use of claim 73 or 74, wherein said T cell debulking is effected by antibodies.

82. The use of claim 81, wherein said antibodies comprise an anti-CD3 antibody.

83. The use of claim 73 or 74, wherein said immature hematopoietic cells are treated by B cell debulking.

84. The use or use of claim 83, wherein said B cell debulking is effected by an anti-CD19 antibody or anti-CD20 antibody.

85. The use of claim 73 or 74, wherein said T cell depleted immature hematopoietic cells are obtained from a non-syngeneic donor.

86. The use of claim 85, wherein said non-syngeneic donor is allogeneic or xenogeneic with respect to the subject.

87. The use of claim 73 or 74, wherein said cyclophosphamide is effected in two doses.

88. The use of claim 87, wherein each of said two doses comprises a concentration of about 50 mg per kg body weight.

89. 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 5×10^5 $CD3^+$ T cells per kilogram body weight , and wherein said dose comprises at least about 5×10^6 CD34+ cells per kilogram body weight ; 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.

90. 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 5×10^5 $CD3^+$ T cells per kilogram body weight, and wherein said dose comprises at least about 5×10^6 CD34+ cells per kilogram body weight; 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.

91. The use of claim 89 or 90, further comprising a reduced intensity conditioning protocol.

92. The use of claim 89, 90or 91, further comprising an *in-vivo* T cell debulking conditioning protocol.

93. The use of claim 89 or 90, wherein said cell or tissue graft comprises immature hematopoietic cells.

94. The use of claim 89 or 90, 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.

95. The use of claim 89 or 90, wherein said cell or tissue graft comprises a co-transplantation of several organs.

96. The use of claim 89 or 90, wherein said cell or tissue graft and said T cell depleted immature hematopoietic cells are obtained from the same donor.

97. The use of claim 89 or 90, wherein said T cell depleted immature hematopoietic cells comprise less than 1×10^6 $CD8^+$ TCRα/β negative cells per kilogram body weight .