WHAT IS CLAIMED IS:

1. A method of preparing a population of hematopoietic stem cells (HSCs), the method comprising:
   providing a population comprising hemogenic endothelial (HE) cells obtained from non-embryonic stem cells, and
   (i) contacting the HE cells with an amount of an agonist of transient receptor potential cation channel-subfamily vanilloid member 4 (Trpv4); and/or
   (ii) subjecting the HE cells to cyclic 2-dimensional stretching,
   for a time and under conditions sufficient to stimulating endothelial-to-HSC transition.

2. The method of claim 1, wherein the HE cells are obtained from iPSC.

3. The method of claim 1, wherein the agonist of Trpv4 is selected from the group consisting of Arachidonic Acid, 5,6-EET, 8,9-EET, bisandrographolide A (BAA), Phorbol ester (e.g., 4α-PDD and 4α-PDH), RN-1747, substituted 1,4-diaminobutane or 1,3-diaminopropane analogues; and GSK10116790A.

4. The method of claim 1, wherein the HE cells are obtained from a subject who has a blood, bone marrow, metabolic, or immune disease.

5. The method of claim 4, wherein the subject does not have a hematological malignancy.

6. The method of claim 1 further comprising the step of formulating the HSCs as a medicament for the treatment of a blood, bone marrow, metabolic, or immune disease in a subject.

7. The method of claim 6 wherein the medicament is administered to the subject by intravenous infusion or intrabone marrow transplantation.

8. The method of claim 7 wherein the HE cells are obtained from the subject.

9. The method of claim 7 wherein the HE cells are obtained from another subject who is matched with the subject based on blood type and Human leukocyte antigen (HLA) type.

10. The method of claim 7 wherein the administration of the medicament to the subject follows myeloablative, nonmyeloablative, or immunotoxin-based (e.g. anti-c-Kit, etc.) conditioning regimes.

11. Use of HSCs prepared by the method of claim 1, in the manufacture of a medicament for the treatment of a blood, immune, metabolic, or bone-marrow failure disease in a patient through an autologous transplantation of the HSCs, wherein the patient does not have hematological malignancy and is not eligible for autologous transplantation of bone marrow-derived HSCs.

12. The use of claim 11, wherein the disease in the patient is selected from the group consisting of multiple myeloma; non-Hodgkin lymphoma; Hodgkin disease; acute myeloid leukemia; a germ cell tumor; an autoimmune disorder (systemic lupus erythematosus (SLE) or systemic sclerosis); or amyloidosis.

13. The use of claim 12, wherein the medicament is to be administered to the patient following myeloablative, nonmyeloablative, or immunotoxin-based (e.g. anti-c-Kit, etc.) conditioning regimes.

14. The use of claim 12, wherein the medicament is to be administered to the patient by intravenous infusion or intrabone marrow transplantation.