Hematopoiesis: Blood and Immune Cells

The hematopoietic system has been well studied for how different cell types derive from stem cells and progenitor cells, and this knowledge has served as the basis for therapeutic approaches. Indeed, therapeutic use of hematopoietic stem cells is now in common practice, and hematopoietic stem cell transplantation has cured thousands of people with bone marrow failure, leukemia, and hereditary hematologic and immune disorders. One of the goals of the burgeoning stem cell field is to extend the success of past studies in identifying cell surface markers present on stem/progenitor populations, in developing functional in vitro and in vivo assays that accurately measure stem cell activity, and in harnessing these insights to treat human diseases. A great deal remains to be accomplished in the areas of hematopoiesis and hematopoietic stem cell biology to fully realize the promise of hematopoietic cell-based therapies.

The overall goals of this program are:

- To develop methods for using human embryonic stem cells to treat malignant and non-malignant diseases that affect the bone marrow.
- To characterize the biological and functional properties of normal and leukemic hematopoietic stem cells.
- To devise methods for safely expanding hematopoietic stem cells in vitro.
The Blood and Immune Cells pipeline is directed by Drs. Emmanuelle Passegué, PhD and Andrew Leavitt.

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