Modeling hematopoiesis in health and disease

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These lectures will be divided into 2 parts: i) normal hematopoiesis and ii) troubled hematopoiesis. I will set up a mathematical model of hematopoiesis which allows one to estimate the number of active stem cells and their rate of replication, as well as the number of different intermediate stages of differentiation of hematopoietic cells together with their respective rates of replication. Next I show how this description of normal hematopoiesis can be used to understand hematopoietic disorders, namely: Paroxysmal Nocturnal Hemoglobinuria (PNH), Chronic Myeloid Leukemia (CML) and Cyclic Neutropenia (CN).