**Basic Concepts**

The capacity of an individual cell to repopulate a stem cell niche first demonstrated Furth in 1937, by transferring a single leukemia cell into a mouse recipient.{~Furth.1937} The cells responsible for this phenomenon later became known as the cancer/leukemia stem cells.undefined In 1961, McCullochundefined quantified the colonies that had arisen from individual hematopoietic cells in the spleen of lethally irradiated mice after transplanting normal bone marrow.undefined Few years later, he and his coworkers transferred this quantitative assay *in vitro*, using semi-solid cell culture, greatly facilitating hematopoiesis research.undefined In 1977, Lajthaundefined encapsulated four decades of primarily hematological research by functionally distinguishing three states of cells. The first were stem cells capable of indefinite self-renewal without differentiation. The second were the transit cells endowed with a limited but great potential to proliferate and the capacity to differentiate according to specific fate commitment (progenitor cells). The third were differentiated mature cells, which do not proliferate and can renew their molecular inventory only.undefined

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