Evolution of Cancer Stem Cells in Acute Myelogenous Leukemia and Targeting Via Novel Nanotechnology Approaches

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The cancer stem cell model is a hierarchical representation of the asymmetric division of cancer stem cells to form transit-amplifying cells, and ultimately differentiated cancer cells. The model can be applied to Acute Myelogenous Leukemia (AML), a hematopoieticderived cancer. A single tumor population of AML is composed of a minor cancer stem cell subpopulation as well as the majority transit-amplifying cell population. Following treatment of AML with chemotherapy and radiation, the tumors repopulate, as the cancer stem cells remain to regrow the transit-amplifying cell population. This is supported by evidence of an increased number of cancer stem cell markers following relapse of AML, such as CD34, CD38, and CD45 surface markers. Cancer stem cells are therefore the focus of targeted cancer therapies, such as novel nanotechnology drug approaches, which improve speed and accuracy of drug delivery.