

Abstract

Stem cells are non-differentiated self-renewing cell population that can derive different kinds of cell types according to their differential potential. Neurogenic differentiation is the process of generating of all three types of nervous systems from the neural stem cells. This process is common for embryonic development, however neurogenesis appears to be present also in adult mammalian brain. It continues to generate new neurons within its microenvironments called niches and we can find two major areas of neurogenesis. One is the subventricular zone of the forebrain, the other is the subgranular zone within the hippocampal dental gyrus. In these niches we can find specific signaling molecules called morphogens. Morphogens function in regulating neural stem cell activity. They play a part in proliferation, differentiation and cell migration, thus determining the fate of neural cells. In addition, morphogens play an important role in many diseases and cancers.