

Adult stem cells and their properties

A stem cell is a cell with a capacity to divide and to make copies of themselves for a prolonged period of time without differentiating. This property, called self-renewal, is the defining property of stem cells. In addition, a stem cell has the ability to produce daughter cells that have different and more restricted properties. These differentiated or specialized cells, will give rise to the many cells in the body, such as the nerve, liver, muscle and blood cells.

Stem cells are broadly classified as either adult or embryonic. Stem cells that come from fetal tissue or umbilical cord blood are technically classified as adult stem cells. Scientists, in many cases, prefer the term tissue stem cells for all stem cells other than those from embryos.

Stem cells are the body's silent reserves. At any given moment, many of the stem cells in the body won't be doing very much. They will only spring into action when the body needs either to produce more stem cells (self renewal) or make more of other specialized types of cells (differentiation). The above properties of stem cells explain why a wound would continuously heal or why blood components are replaced endlessly after bleeding.

However, the concept of 'one stem cell, one tissue' has been exposed to questions in the last few years by several studies showing that adult stem cells have the capacity to differentiate into a much wider range of tissues (plasticity) than previously thought possible. Despite the contentious nature of these studies, they have been instrumental to boost clinical research for the use of stem cells.