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HUMAN EMBRYONIC STEM CELLS: THE FIRST FIVE YEARS

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Human embryonic stem cells (hESC) were first derived late in 1998. Since then, there has been considerable progress in the characterisation of the hESC phenotype, and in the analysis of early stages of stem cell differentiation. Some extrinsic factors critical to maintenance of hESC in the pluripotent state have been identified, including phospholipids and growth factors that act synergistically through specific receptor systems to support stem cell renewal. Although hESC cells develop karyotypic abnormalities in some culture systems, new methods have been developed for identifying, monitoring and eliminating abnormal cells. Conditions for the controlled differentiation of neural and endodermal progenitors from hESC cultures have been identified. These progenitor cells are being assessed in preclinical models for their ability to repopulate damaged tissue.