

## Editorial

# Stem Cells and Nuclear Reprogramming

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Stem cells are found in all multicellular organisms, including two broadly defined cell types: embryonic stem cells (ESC) (C. Y. Cheong and T. Lufkin; and N. Lifantseva et al.) that are derived from the inner cell mass of blastocyst-stage embryos and adult stem cells that are present in adult tissues (C. M. Teven et al., R. Chung et al., and A. C. Wilber et al.). Nuclear reprogramming refers to the erasure and remodeling of epigenetic marks, which is a part of normal mammalian development. This reprogramming is likely required for totipotency of the newly formed embryo and erasure of acquired epigenetic changes (Felici). Advances in stem cells including induced pluripotent stem (IPS) cells (D. Dey and G. R. D. Evans; and P. Noisa and R. Parnpai) and nuclear reprogramming (C. M. Teven et al.) will provide new insights into the mechanisms of cellular differentiation, during embryonic development (N. Lifantseva et al.) as well as in adult tissues (C. M. Teven et al.), and their pluripotency (A. C. Wilber et al.), which may lead to cell-based therapies (R. Eggen-schwiler et al.) for several human diseases (R. Chung et al.).

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