

p53 and stem cells: new developments and new concerns.

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Public Summary:

Scientific Abstract:

As the guardian of the genome, the tumor suppressor p53 prevents the accumulation of genetic mutations by inducing cell cycle arrest, apoptosis or senescence of somatic cells after genotoxic and oncogenic stresses. Recent studies have identified the roles of p53 in suppressing pluripotency and cellular dedifferentiation. In this context, p53 suppresses the self-renewal of embryonic stem cells after DNA damage and blocks the reprogramming of somatic cells into induced pluripotent stem cells (iPSCs). If the inactivation of p53 pathway is a prerequisite for successful reprogramming, these findings raise concerns for the genomic stability and tumorigenicity of iPSCs and their derivatives. Elucidation of the roles of p53 as a barrier to pluripotency and cellular dedifferentiation might also reveal the mechanisms by which p53 coordinates tumor suppression and aging.

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