

## Review

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### Deconstructing stem cell self-renewal: genetic insights into cell-cycle regulation

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The regulation of stem cell self-renewal must balance the regenerative needs of tissues that persist throughout life with the potential for cell overgrowth, transformation and cancer. Here, we attempt to deconstruct the relationship that exists between cell-cycle progression and the self-renewal versus commitment cell-fate decision in embryonic and adult stem cells. Recent genetic studies in mice have provided insights into the regulation of the cell cycle in stem cells, including its potential modulation by the stem cell niche. Although the dynamics of the embryonic and adult stem cell cycles are profoundly dissimilar, we suggest that shared principles underlie the governance of this important decision point in diverse stem cell types.

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