

The tumorigenic potential of pluripotent stem cells: What can we do to minimize it?

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Public Summary:

Human pluripotent stem cells (hPSCs) have the potential to fundamentally change the way that we go about treating and understanding human disease. Despite this extraordinary potential, these cells also have an innate capability to form tumors in immunocompromised individuals when they are introduced in their pluripotent state. Although current therapeutic strategies involve transplantation of only differentiated hPSC derivatives, there is still a concern that transplanted cell populations could contain a small percentage of cells that are not fully differentiated. In addition, these cells have been frequently reported to acquire genetic alterations that, in some cases, are associated with certain types of human cancers. Here, we try to separate the panic from reality and rationally evaluate the true tumorigenic potential of these cells. We also discuss a recent study examining the effect of culture conditions on the genetic integrity of hPSCs. Finally, we present a set of sensible guidelines for minimizing the tumorigenic potential of hPSC-derived cells.

Scientific Abstract:

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