

# Scientists illuminate a method for safer stem cell treatments

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Because they can develop, or differentiate, into basically any tissue type, pluripotent stem cells (PSC) could be the key to a host of regeneration therapies. But those PSCs in a culture dish that remain undifferentiated could form teratomas, a kind of tumor, if transplanted into patients. This week in *ACS Central Science*, researchers report a new light-based technology that could remove this risk.

Stem cell treatments hinge on the ability of PSCs to become all of the different cell types in the body. But that same adaptability means that they can also remain undifferentiated and form tumors. The best way to protect patients from these potential side effects is to make sure that they only receive cells that have successfully morphed into the desired tissue. Hyuk-Jin Cha, Young-Tae Chang and colleagues set out to design a system to seek and destroy any un-morphed cells, while leaving the differentiated ones unharmed and ready for transplantation.

The researchers created a special dye that can selectively stain PSCs without getting into differentiated ones. In addition, when the dye is exposed to light, it turns on the production of [reactive oxygen species](#) that then kill these cells. The researchers used undifferentiated PSCs transplanted into mice to demonstrate the method. None of the mice that received light-treated PSCs with the dye developed teratomas, whereas all of those in the control group receiving PSCs that were not treated with light did. Cha and Chang believe the dye-light combination approach could greatly improve the safety of a wide array of [stem cell therapies](#).

**More information:** Seung-Ju Cho et al. Photodynamic Approach for Teratoma-Free Pluripotent Stem Cell Therapy Using CDy1 and Visible Light, *ACS Central Science* (2016). [DOI: 10.1021/acscentsci.6b00099](https://doi.org/10.1021/acscentsci.6b00099)

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