

Moving beyond embryonic stem cells: Encouragement on the horizon

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For nearly two decades, the medical world and the American public have grappled with the lightning-rod topic of stem cells, in particular the controversy surrounding cells from human embryos. But when researchers four years ago successfully "reprogrammed" adult body cells to become stem cells, some thought the ethical debate was nearly over. Those redirected cells, known as induced pluripotent cells, or iPS cells, show potential as therapy.

"The benefit is they require no destruction of [human embryos](#)," says Mayo Clinic hematologist/oncologist C. Christopher Hook, M.D., an author reviewing the science and ethics of stem cell technologies in the July issue of [Mayo Clinic Proceedings](#). "The hope is that these cells may make embryonic stem cells unnecessary, but, according to the stem cell scientists, we're not there yet."

Scientists who specialize in stem cells continue to regard embryo-derived cells as the gold standard among stem cells in pluripotency, the capacity to become any tissue in the body. Other stem cell technologies have benefits: Blood, bone marrow, and umbilical cord cells contain stem cells that treat leukemia and other blood cancers, but because they are [adult stem cells](#) lacking pluripotency, they've shown limitations as universal regenerative therapies. The newcomers on the scene, iPS cells, can be taken directly from each patient and genetically redirected to replace ailing cells, avoiding [immune rejection](#) or the need for existing embryos or eggs to create embryos.

Hook cautions that there are still challenges with iPS cells, and the public shouldn't expect therapies to roll out in the next year or so.

"One of the problems with the history of stem cell technologies in general has been the unrealistic hype and promise of therapies far faster than the science could produce," Hook says.

In an editorial in the same issue, medical geneticist Andre Terzic, M.D., Ph.D., the Marriott Family Professor of [Cardiovascular Research](#) at Mayo Clinic, states that iPS technology may not have reached fruition, but is invaluable for learning about diseases and testing new treatments.

"We need to accelerate the pace of this research, and speed discoveries in regenerative medicine to help patients," Terzic says.

Worldwide, however, state-of-the-art research still depends on embryonic stem cells, at least in serving as a biological yardstick.

"This is a topic that remains charged and highly politicized," Hook says. "Some claim the controversy about the need for embryonic stem cells should now be resolved. Hopefully, in time, with iPS's the perceived need for and use of human [embryonic stem cells](#) will rapidly become obsolete, but, according to many in the scientific community, we're far from being done with them. There may be another option in the use of these new cells, but it's going to take time."

More information:

www.mayoclinicproceedings.com/

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