

## iPS cells, a big breakthrough

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The future is in the iPS cells, believes Dr James Thomson. Dr Thomson is the man who set ablaze the field of stem cell research, when he became the first scientist to isolate and develop methods to culture the human embryonic stem cells. That was 10 years ago. Since then, scientists world over are busy finding ways and means to take this research further and apply it to finding solutions to diseases plaguing the mankind while the research itself has been inciting hot debates and has drawn in right from the Church to politicians across the globe.

In fact, it wouldn't be wrong to say that to some extent the November presidential election in the US hinges on ending political restrictions on embryonic stem cell research. The issue is powerful enough to force Obama and McCain clarify their stand on stem cell research.

But have no illusions. Mired in legal, regulatory and ethical issues any stem cell cure would have to go through the necessary "rite of passage". The effective therapies could be five years down the line or maybe more than a decade away. Science is a world of high stakes and even Dr Thomson cannot see the future and predict with certainty what route this research will take and how long will it be before we arrive any closer to delivering regenerative medicine to the masses. At the World Stem Cell Summit 2008 (Sep 21-23) in Madison, US Dr Thomson advised scientist to keep an open mind. He stated that there could be evidence to show that the iPS cells are fatally flawed.

Induced pluripotent stem cells or iPS cells is a big breakthrough in the stem cell research arena. Dr Thomson and his team of researchers successfully reprogrammed the human adult skin cells to act like human embryonic stem cells. The breakthrough

it is said is likely to change the course of action making research on embryonic stem cells redundant, given that iPS cells are remarkably similar to human embryonic stem cells. Besides researchers can skirt all the ethical issues related to human embryonic stem cells (hES) and can make as many iPS cells they need for research.

### **Global Stem Cell Market Scenario**

- The global market for stem cell therapies is expected to be \$20 billion by 2010.
- There are currently more than 100 different companies involved directly or indirectly in the development of stem cell therapy. 50 prominent ones are into active commercialization.
- The US leads the market with the presence of more than 35 companies. California, Florida, Texas are the stem cell hubs.
- The EU follows with presence of 11 companies. UK, and Sweden are the most prominent regions for stem cell development.
- The global stem cells market is currently dominated by adult stem cell companies, accounting for 58 percent share in market presence. Out of 58 percent of adult stem cell companies, 80 percent belong to bone marrow derived stem cells.
- Adult stem companies are primarily based in the US (30), and the EU (11) with some presence in Israel, Thailand, Canada, Singapore & Australia and India.

*Source: Stempeutics*

The iPS cells were discovered by two independent research teams-one headed by Dr James Thomson of the University of Wisconsin-Madison and the other by Dr Shinya Yamanaka of Kyoto University in Japan. They independently developed methods to induce pluripotency, the quality that allows stem cells to develop into any kind of body cells. The "induced pluripotent stem cells" (iPS cells) can then be differentiated into any of the body's 220 somatic cell types. Until now, the only way to acquire pluripotent cells was to harvest them from a fertilized embryo, destroying the embryo in the process.