

Cells that undergo nuclear transfer can live forever, says Nobel winner

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Sir John Gurdon, the 2012 Nobel Prize winner in Physiology or Medicine, says that all cells in the body are made up of a similar constitution and that adult cells can nowadays be programmed with ease. He also says that replacement of all non functional cells can become a real phenomenon, if we deal with the administrative problems.

Dr Gurdon speaks exclusively to *BioSpectrum* on a wide variety of topics ranging from the hardships faced by today's stem cell researchers to the future of cloning. The excerpts are as follows:

Where do you see cloning 10 years from now?

Cloning will only become more efficient as time progresses. The process and outcome of cloning can be only as efficient as a sperm. A sperm is a very specialized cell. It fertilizes the egg and immediately attains 100 percent efficiency. However, when we do a cloning experiment, similar efficiencies are not observed. Our goal should be to strive to make this process better.

How do we monitor the doctors and the procedures used by them in cloning techniques? Is there a standard operating procedure (SOP) for the same?

In order to ensure that the same protocols are followed we need to train the personnel, like we would do for any other science, say for example a cataract surgery. The crucial question is, whether the doctor should be prosecuted if he fails to carry out the protocols effectively.

Moreover, companies that deal in such procedures should ensure that their staff is not inclined towards any particular brand or protocol. They need to remain uncommitted and neutral in their approach and should never persuade the patients.

Can you talk about the longevity of stem cells following their differentiation?

The extent to which a stem cell survives depends on a lot of things, including the processes involved to extract or transfer them. Usually cells that undergo cellular nuclear transfer can stay alive forever.

How do cells seek their position in the gradient? Do you believe in morphogenetic field theories?

It is a question of the ongoing concentration of cytoplasmic factors. These factors, which have a half-life of one hour, travel into the nucleus of the cell and lead to the binding of the promoter region of the gene. The concentration of these transcription

factors determines the binding efficiency. However, the precise details are yet to be understood completely. Things like the dwell time of transcription factors are yet to be determined.

What kind of hardships are scientists facing these days?

The difficulties and hurdles being faced by researchers stem cell or otherwise, have been similar across the world and across the ages. Getting financial support from organizations that provide grant is always tedious. You need to prove that the kind of research you are doing by utilizing the funds is worth it.

How does Sir John Gurdon define science?

Science is too complicated to be described by an individual.