

# Regulating stem cell research in India: Wedding the public to the policy

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*Given the promise offered by the emerging dimensions of stem cell technology, it has become incumbent to regulate the same and converge the interests of the scientific community, healthcare professionals and patients. This article presents a framework for discussion of the possible direction of devising regulations for a robust yet facilitative regulatory regime for stem cell research in India.*

**Keywords:** Draft ICMR Guidelines, international collaboration, National Apex Committee, regulatory agency, stem cell regulation.

THE mushrooming of private and public healthcare centres claiming stem cell treatment for a wide range of diseases, has put the government in a scurry of activity to develop cogent guidelines for installing a robust regulatory regime and a monitoring agency to augment competent stem cell research in India. In fact, policy makers in most parts of the globe have been grappling with the ethical questions that the onset of stem cell technology presents. The Indian Council of Medical Research (ICMR), in light of the above mandate, has drafted a set of guidelines for regulation of stem cell research, which is currently open for public examination and debate.

This article proposes to consider some of the issues that would need to be resolved in order to flag-off a regulatory regime in this field. Further, the article would also examine the Draft ICMR Guidelines. In doing so, it would seek to suggest certain amendments to the Draft ICMR Guidelines.

## The promise of stem cell research

There are myriad complex academic definitions of stem cell, but the most important idea is that stem cells are undifferentiated cells that can renew themselves and also give rise to one or more specialized cell types with specific functions in the body.

Thus human stem cell research offers immense promise for developing new medical therapies for several debilitating diseases and a critical means to explore fundamental questions of biology. Stem cell research could possibly lead to unprecedented treatments and potential cures for Alzheimer's disease, cancer, diabetes, Parkinson's disease and other diseases<sup>1</sup>.

## The schism: embryonic cells vs adult cells – the first hurdle

For proponents, these cells represent our greatest hope for treating devastating disorders such as Parkinson's disease, diabetes and spinal-cord injuries. But for those who are adamantly opposed to the use of cells derived from human embryos, stem cells from adults have been advocated as an ethically palatable and experimentally reasonable alternative<sup>2</sup>.

Kim and colleagues<sup>3</sup> describe how they generated a specific class of neurons from cultured mouse embryonic stem (ES) cells and used the neurons to reverse symptoms of Parkinson's disease in rats. In other words, ES cells can generate specialized cell types that are therapeutically effective in animals. Meanwhile, Jiang and colleagues<sup>4</sup> have derived remarkably versatile cells from the bone marrow of adult mice, rats and humans. These two studies further the promise of stem cells even while they stoke the debate about whether such cells should be obtained from embryos or adults.

In light of the above, it is pertinent to note that our regulatory regime needs to be flexible albeit with robust controls for therapeutic cloning and avoid positions such as not permitting creation of embryos for the 'sole purpose of obtaining stem cells' as in the current Draft ICMR Guidelines, because imposition of a blanket ban on such research would not be in the best interests of realizing the full potential of stem cell technology.

## The international scene – no easy answers

Internationally there has been upheaval in this area and several nations are still grappling with the ethical minefield that this new technology has unveiled. Among the major scientific nations, Britain emerged in 2001 as an

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enthusiastic supporter of ES cell research, amending its law to allow ES cells to be isolated from human blastocysts – the hollow ball of cells that form after some five days of embryological development – for research into regenerative medicine<sup>5</sup>.

Japan has also prepared guidelines that will give its researchers similar freedom. Sweden, Israel and Australia are also supportive of work on human ES cells.

However, some European countries have no regulations at all, while in others, there is a complete ban. In France, researchers have been campaigning for more than two years to amend the law to allow research on human ES cells, and their isolation from blastocysts<sup>6</sup>.

In Germany, deriving human ES cell lines is prohibited by the strict embryo protection law, but a loophole remains that importing the cells has not yet been banned<sup>7</sup>. Although the DFG, Germany's main research granting body, has approved funding for human ES cell projects in principle, it is currently sitting on its hands, waiting for the parliamentary and public debate to reach a conclusion.

The pioneering work of Kim *et al.*<sup>3</sup> and Jiang *et al.*<sup>4</sup> will not resolve the debate over embryonic versus adult stem cells. On the contrary, it further underlines the need to facilitate research in this area, unfettered by political concerns. Only then will the public have a chance to get what it deserves: novel, validated and safe treatments for intractable diseases.

Having said so, it becomes necessary to devise a structure of robust controls over research in this area and put the Draft ICMR Guidelines to this test.

## An Act of Parliament

Any guideline issued by the ICMR can at the most constitute good research practice. In the absence of statutory backing, the same would not be able to fulfil the objectives of monitoring and ensuring that stem cell research is conducted in the most ethical manner. Therefore, once the ICMR has concluded the process of public debate on the Draft ICMR Guidelines, the same must be translated into an Act of Parliament without further ado.

## Scope of the National Apex Committee

The Draft ICMR guidelines vests the National Apex Committee (NAC) with the responsibility to examine the scientific, technical, ethical, legal and social issues in the area of cell-based research and therapy. Whereas at the same time, it makes the ICMR the regulatory authority in the area of 'biologicals'. The respective powers of the NAC and the ICMR must be laid down to prevent any confusion and multiplication of authorities dealing in the same area.

Further a permanent regulatory body needs to be established, which is vested with the responsibility to regulate all aspects of stem cell research in India. For example, instead of an ad hoc committee like NAC which would meet quarterly, a statutory body ought to be vested with the power to license centres involved in stem cell research as well as projects on stem cell research and embryo storage; maintain a code of practice and a register of licensed treatments; provide advice and information to the public, prospective patients and clinics, and keep the field under active review.

Past practice in the field of telecom regulation has shown that an independent, full-time regulatory body such as the Telecom Regulatory Authority of India, could just be what the doctor prescribed to trigger explosive growth in the sector.

It is interesting to note that scientists all over are feeling fettered by the various layers of authorities being created to regulate stem cell research<sup>8</sup>. Thus, if India is to emerge as a world leader in this area, which it is eminently poised given its vast talent pool and scientific capacities, regulation must be non-intrusive and less cumbersome.

## Composition of Central Monitoring Committee

The Draft ICMR Guidelines provide for setting up of a Central Monitoring Committee (CMC) which would be a sub-committee of the NAC, to make site visits as and when required. However, there is no elaboration about the express purpose of the CMC nor is the composition of the committee spelt out.

The composition of this committee ought to be delineated in the guidelines itself, so as to prevent the kind of scenes witnessed not so long ago with monitoring committees having animal rights activists with no scientific background dispatched by the CPCSEA.

## Local oversight body

A local oversight body at the institution level itself ought to be provided for, which would shoulder the bulk of the monitoring after a particular institution has been granted permission to conduct stem cell research by the apex regulatory body. There is a move worldwide towards institutional self-regulation<sup>9</sup>. Such a body would obviate the need for visits by the CMC to a large extent. This institutional body can be made liable for any non-reporting of non-compliance. Thus, a local self-regulatory framework under the overarching statutory regulatory body could prove to be just the right admixture for a trailblazing finish by the Indian stem cell researchers.

### Punishment clause

The extent of ambiguity and subjectivity prevalent in the Draft ICMR Guidelines can be gauged from the phrase 'Any violation of guidelines would be strictly dealt with'. This is in sharp contrast with the New Jersey law passed to regulate stem cell research, which makes cloning for the purposes of creating a human being a first-degree crime punishable by up to 20 years in jail. Therefore, for any regulation purporting to regulate stem cell research, the punishment or penalty must be clearly laid down for deviation from the same.

### Patent issues

The Draft ICMR Guidelines take a dip into the ocean that patent-related issues are and come up with 'Patent issues need wider discussion and public debates should be held on who should be the beneficiary and what type of patents can be taken'. This is in sharp contrast with the policy of the United States Patent and Trademark Office, which has granted dozens of patents involving cells derived from human embryos.

Leaving such an open-ended policy statement in the Draft ICMR Guidelines would open the field for scenes being witnessed in the European Patent Office (EPO)<sup>10</sup>, where that panel decided that any claims involving human ES cells violated the European Patent Convention<sup>11</sup>. Though the matter has gone on appeal, EPO patent examiners are taking the review panel's decision as a precedent.

The recent decisions of the EPO probably will not slow down the pace of basic research, but they will have a chilling effect on European biotechnology companies that might have considered investing in stem cell research.

Biotechnology companies in general depend on patent protection for their initial worth. Therefore, to safeguard against such a situation, it is critical that such a vaguely worded provision be deleted from the Draft ICMR Guidelines. Existing patent laws in India are adequate to take care of inventions arising out of stem cell research and thus inclusion of such a provision would only add to confusion and open the Pandora's box for anti-science rhetoric.

### Therapeutic trials – three legged race!

Therapeutic trials run into a brick wall wide the provision, 'All proposals for therapeutic trial should be cleared by this committee before submitting to DCGI.' This is a mere duplication of authority and it would be far more practicable for the DCGI to devise a single-window clearance either at the level of the regulatory authority for stem cell research itself or at the DGCI, so as to prevent the time gap and multiplication of levels.

### International collaboration

In view of the dynamic environment surrounding stem cell research, the scorching pace of scientific research requires international collaboration in a much more expeditious manner than what the Draft ICMR Guidelines envisage.

The Draft ICMR Guidelines provide that, 'Collaboration will be permitted only after the joint proposal with appropriate MOU is approved by the Health Ministry's Screening Committee following clearance by the Apex Committee'.

This is a classic case of hitting the baby with the bathtub after throwing away the bathwater! If the guidelines were to accept in principle that stem cell research is permissible in India, then why erect a twin-stage staggered approval process? In any event, if the international collaboration were to run contrary to or violate the guidelines put in place, punishment or penalty could be invoked according to a well-defined penalty clause. Therefore, to treat international collaboration on a different footing would in fact be detrimental to the pace of progress in this field.

A leaf probably needs to be taken from the policy governing Foreign Direct Investment (FDI). FDI up to 100% is allowed under the automatic route from foreign/NRI investor without prior approval in most of the sectors, including the services sector. FDI in sectors/activities under automatic route does not require any prior approval either by the Government or the Reserve Bank of India (RBI). Investors are required to notify the concerned Regional Office of RBI within 30 days of receipt of inward remittances and file the required documents with that office within 30 days of issue of shares to foreign investors. Further, 100% FDI is permitted under the automatic route for both 'research and development services' as well as 'health-related services'.

Thus it is clear that in the field of scientific research, the policy of the government is towards seamless integration of knowledge bases. Thus to impose artificial barriers where none is required would be counter-productive.

### Conclusion

In light of the preceding discussion, it would appear that the government must put its act together and put in place a statutory framework under a full-time regulator in the field of stem cell research. ICMR must be commended for kicking-off a debate in this area through its Draft Guidelines and initiating discussions through a series of national and international symposia. However, now the time is ripe to consolidate the gains from the public debate and collective wisdom of symposia and devise a statute which would clear all uncertainties currently facing stem cell research in this country. The hopes of the citizenry have been enormously raised by the hype surrounding

stem cell research, and thus it becomes incumbent upon the Government to put in place a regulatory regime, which would at least provide a chance for some of those hopes to see the light at the end of the tunnel.

1. McKay, R., Stem cells – hype and hope. *Nature*, 2000, **406**, 361–364.
2. Orkin, S. H. and Morrison, S. J., Biomedicine: Stem-cell competition. *Nature*, 2002, **418**, 25–27.
3. Kim, J.-H. *et al.*, Dopamine neurons derived from embryonic stem cells function in an animal model of Parkinson's disease. *Nature*, 2002, **418**, 50–56.
4. Jiang, Y. *et al.*, Pluripotency of mesenchymal stem cells derived from adult marrow. *Nature*, 2002, **418**, 41–49.
5. Adam, D., Britain banks on embryonic stem cells to gain competitive edge. *Nature*, 2002, **416**, 3–4.
6. Aldhous, P., Regenerative medicine: A world of difference. *Nature*, 2001, **414**, 838.
7. Abbott, A., Blow to German stem-cell prospects. *Nature*, 2001, **414**, 238.
8. Holden, C., Stem cell researchers mull ideas for self-regulation. *Science*, 2004, **306**, 586.
9. Holden, C. and Vogel, G., Panel would entrust stem cell research to local oversight. *Science*, 2005, **308**, 611.
10. The EPO issues patents valid in its 28 member countries.
11. Vogel, G., Stem cell alternatives. *Science*, 2004, **305**, 1887.

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