

Benefits of Embryonic Stem Cell Research

By Dr. Udo Schuklenk and Mr. Jason Lott

Stem cells—undifferentiated cells that can divide and differentiate to replace dead or dying cells—are not a recent discovery. Scientists have long known about adult stem cells, such as those found in bone marrow actively replenishing red blood cells, and have used them in a variety of therapeutic/curative procedures, including bone marrow transplants for the treatment of leukemia and skin grafts for burn victims. The utility of adult stem cell therapy has not extended far beyond these limited examples, however, and will likely not do so in the near future, as recent studies have suggested that adult stem cells may be less versatile than previously thought.¹

Unlike adult stem cells, embryonic stem cells, derived from the inner mass of embryos only 100-200 cells large, can differentiate into any type of tissue and offer scientists the requisite versatility to conquer a broad spectrum of illnesses, including (but not limited to) Alzheimer's, Parkinson's, cystic fibrosis, retinitis, and organ failure.

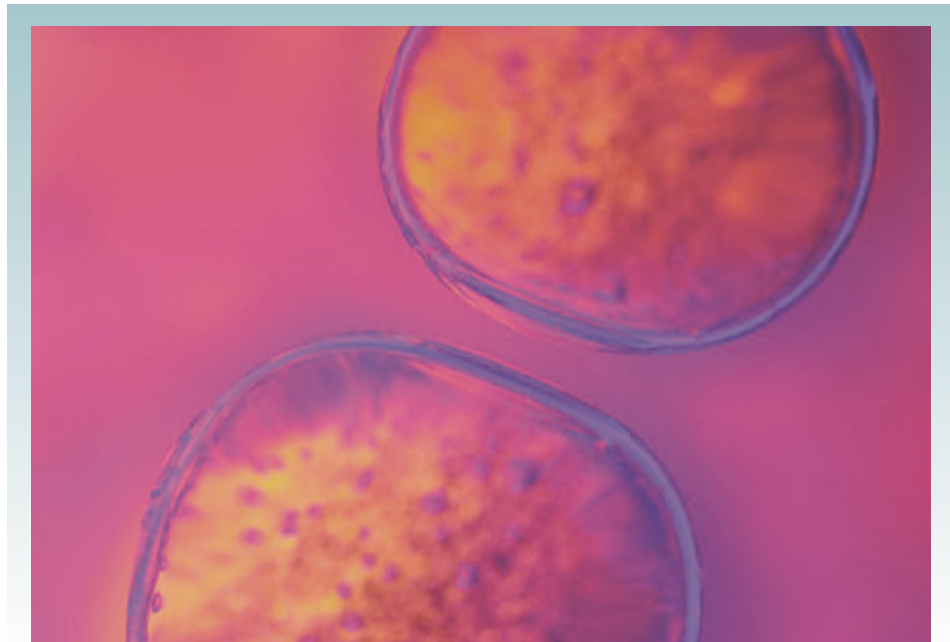
Finding cures for the first three highlights the most promising and immediate gains predicted from embryonic stem cell research, namely the ability to cure any disease resulting from or accompanying loss of specific cell types. New cells would be produced

in the laboratory and then injected into the targeted tissue to slow and eventually halt the progression of the disease.² Moreover, substantial tissue could be regenerated in vivo to restore the body to its original, pre-disease condition, as though the disease had never happened.

In addition to these therapies, embryonic stem cell research may also aid patients in need of a transplant. There are currently over eighty-four thousand people waiting for an organ transplant in the United States, with little hope of success.³ The situation is even worse in South Africa, where only a few hundred persons

donate organs each year.⁴ Initiatives intended to increase organ donation have done little to increase supply, and, ethical concerns notwithstanding⁵ development of effective xenotransplantation techniques has proven disappointing, as have other approaches.⁶ Meanwhile, the demand for organs has steadily increased with no indication of decline.

Embryonic stem cells will allow researchers to grow their own organ supply, discounting the future need for organ donation.⁷ By teasing these cells to differentiate into liver or kidney cells, for example, and providing the appropriate scaffolding, extracel-



lular environment, etc., a whole liver or kidney will be created in the laboratory that exactly matches the genetic code of the intended recipient, removing the need for costly post-operative immunosuppressive drug therapy. Alternatively, this same drug therapy could be employed to make any organ created from embryonic stem cells compatible with the intended recipient, suggesting a more immediate solution to shortage problems and offering a mechanism to “stock-pile” organs for future use.

International Controversy

Despite its therapeutic potential, embryonic stem cell research has become the latest victim in an international debate focused on the moral status of the embryo. Accordingly, most of the arguments against embryonic stem cell research are closely related to those voiced during the height of the abortion debate decades earlier and reflect similar religious concerns.

Catholics, for example, condemn this research, claiming it “cannibalizes” embryos “for their spare parts while still alive.”⁸ This is not surprising, since most Catholics believe that life begins at conception and embryos are “little persons” to be treated with unconditional respect. Since extraction of stem cells involves the destruction of the embryo, most Catholics consider it outright murder, prompting the Pope to warn US President George Bush against “this assault on human life.” Instead, the Pope has urged Bush to reject “practices that devalue and violate human life at any

stage from conception until natural death,” fearing embryonic stem cell research will lead “to accommodation and acquiescence in the face of other related evils.”⁹

Other conservative Christian leaders in the United States describe the research as “embryo farming” which kills “defenseless human beings for the possible benefit to others.”¹⁰ Similar sentiments have been echoed across Europe, prompting Austria, Ireland, Italy, and Denmark to effectively ban embryonic stem cell research, with other countries introducing legislation to do the same.¹¹

Though we find these concerns unconvincing, we shall not attempt a comprehensive defense of embryonic stem cell research, as it would demand deeper philosophical analysis beyond the scope of this article. We only wish to indicate the direction this debate has taken thus far in the international arena. Suffice it to say, however, that we have difficulty accepting positions that ask us to believe that an embryo consisting of only a few hundred cells constitutes a person and that it should be treated as such. Given that the embryo does not have the capacity to suffer, we fail to see how such a being could possibly be harmed when it is destroyed in the process of stem cell research. Accordingly, we reject arguments defending the moral status of the embryo, for we believe it has none.

South African Concerns

Interestingly, the South African government has backed a ban on embry-

onic stem cell research for other reasons. According to Dr. Eddie Mhlanga, Chief of Maternal, Child and Women’s Health in the National Health Department, embryonic stem cell research poses a different moral problem, representing a window of opportunity for large Western corporations to exploit impoverished South African women, mining their bodies for embryos to be developed into stem cell lines and shipped elsewhere for research purposes. Dr. Mhlanga says this is “not OK,” since money from this research will likely never find its way back to South African shores and benefit the women from which the embryos were taken.¹² Better to never allow the research in the country, he argues, than permit South Africa to become another petri dish for greedy Western doctors.

Though tempting, the government’s concern cannot be dismissed as paranoia resulting from ignorance or misinformation. International concerns over embryonic stem cell research have landed some countries in an awkward position. While for instance the UK has approved destructive research on human embryos, the United States and Germany, for example, have been forced to balance the predicted benefits embryonic stem cell research against the worries of their conservative constituencies. Their solution is a compromise: forbidding the extraction of stem cells within their respective countries, but allowing embryonic stem cell lines to be imported from elsewhere. The former has allowed embryonic stem cell

research to continue on approximately 68 cell lines already in existence and forbids generation of any new cell lines. No law exists, however, prohibiting research on stem cells derived from embryos outside the United States. The same is true for Germany, which has explicitly encouraged researchers to seek out stem cell lines from other countries.¹³ This compromise will likely be adopted by other developed nations hoping to satisfy both the religious right, who seem to be unconcerned with embryos born outside their national borders, and the medical community, whose original research agendas may continue unaffected.

It is understandable that Mhlanga worries that the United States, Germany, and other countries may look elsewhere, for instance in South Africa for embryonic stem cell lines, convincing poor women to hand over their embryos in exchange for a small sum of money. Stem cells would then be extracted from these embryos and carted back to the United States or Germany, for example, where scientists could complete the remainder of their research legally. The developed countries would ultimately receive most of the profits, while South African women would get a few thousand Rand.

Addressing South African Concerns

An immediate problem with Mhlanga's objection, however, is that it could be leveled against any pharmaceutical research initiative current-

ly underway in South Africa. Worries of exploitation naturally accompany any endeavor between economically disparate countries, but these worries alone do not justify outright rejection of projects in which both parties could benefit. If the South African

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government is prepared to ban embryonic stem cell research for fears of exploitation, it should be equally willing to stop all locally conducted pharmaceutical research sponsored from abroad, since the same risk invariably accompanies all such clinical trials.

Subjecting embryonic stem cell research proposals to intense ethical review should insure, as much as in any other country, that participants are not exploited. Furthermore, the predicted therapeutic benefits would accrue primarily to the participants themselves, though the basic techniques of cell differentiation, maturation, implantation, etc. would inevitably extend beyond any given donor's cell line. The advanced stages of the research would involve implanting donor cells back into targeted tissues of donors to provide genetically specific cures designed for each individual, not entire populations. Hence stem cells extracted from a South African embryo donor suffering from cirrhosis could be used only to treat that donor's liver disease and no one else's. This reduces the risk of exploitation compared to most pharmaceutical trials, where half of the subjects—those receiving a placebo or control—experience few, if any, medical benefits. Furthermore, international research ethics guidelines such as the Declaration of Helsinki, but also the South African Department of Health good clinical practice guidelines demand some form of benefit sharing with the research participants. It should be up to our local ethical review committees to ensure that this is happening. Indeed, even countries with substantially weaker research ethics committees such as India, for example, have decided that it would be too hard a blow to their own genetics research capacity to outlaw stem cell research.¹⁴

It also seems somewhat naïve to believe that even the strictest ethical review could prevent an evil US or German scientist from running away stem cells extracted from South African women, but it seems equally naïve to believe that most scientists are bad people seeking to harm others. Well-monitored clinical trials are the best anyone, in any country, can hope for, and promising medical advancements should not be forgone in the face of minimal danger. Adopting a zero-risk research policy for South Africa means accepting a zero-chance future of improvement and success.

Resisting Paternalism

However, let us suppose, for arguments sake, that Mhlanga's worst fears become reality, and stem cell scientists begin paying poor South African women a few thousand Rand (the price could be much higher) in exchange for embryonic stem cells. Is this necessarily a bad thing?¹⁵

Mhlanga unhesitatingly calls this exploitation, but the reality is that most of these women could use this money to buy much needed food, shelter, medical attention, etc. Assuming that most potential volunteers are rational agents who can make decisions on their own, why should the government endorse paternalistic legislation that decides for them, effectively mandating the closure of a financial opportunity that would otherwise benefit them greatly?

Unlike other medical procedures (such as the removal of a kidney),

procuring an embryo from a mother's womb is a simple procedure less dangerous than most daily activities. Driving a taxi, working in a fast food restaurant, selling newspapers on the street, etc. are all more likely to cause death or serious injury. Since we are comfortable allowing women to work in these sorts of circumstances, where success entails little financial compensation, we should also be comfortable allowing women to participate in this research for substantial monetary reward. To do otherwise is to admit of inconsistency, and leaves the women in question none the richer.

Is embryo stem cell research based on embryos necessary?

Researchers such as Alan Trounson, Australia's leading stem cell researcher, have argued that quite possibly embryo stem cell research relying time and again on embryos may become unnecessary sooner rather than later. He believes that strong pragmatic reasons make Mhlanga's worries pointless, namely the difficulty of obtaining large numbers of donor eggs, and the fact that stem cells would be useful only to the donor, hence resulting into a time-consuming and quite expensive process.¹⁶ His argument is based on the view that it might be possible to grow a sufficient number of stem cell lines from already existing 'spare' IVF embryos. These would be discarded eventually in any case, hence even if one accepted that there is something morally reprehensible about people growing embryos solely for the purpose of

destructive research, nothing much could possibly be said against the use of such surplus embryos that would be destroyed no matter what. This strategy is very much in line with what is currently proposed in the ethics guidelines on genetics research developed by the South African Medical Research Council. It would allow the use of such 'surplus' embryos for research purposes. If Trounson is correct, such research purposes would undoubtedly include the development of stem cell lines grown from such material. This would soon render fears such as those expressed by Mhlanga pointless, because there would be no appreciable demand and market in the first place for rent-a-womb type science. Under these circumstances all that would be achieved by a ban on stem cell research is to ensure that geneticists outside South Africa will likely succeed in developing highly lucrative new drugs while our local geneticists either sit idle by or leave the country altogether.

Modifying the National Health Bill

Refusing to modify the National Health Bill to allow for embryonic stem cell research poses a much greater risk to South Africa than any threats of exploitation. Currently, US and German scientists are flocking to the United Kingdom because of their liberal stem cell research policies, bringing their expertise and financial backing along with them. As a result, the UK will likely become an international leader in embryonic stem cell

research, simply because they didn't say "No."

South Africa shouldn't say "No," either. With many countries adopting obtuse stem cell research policies motivated by religious naysayers, South Africa has the opportunity to join the UK as among the few nations possessing enough foresight to endorse this initiative. The payoff will not only be an influx of eager scientists and research money but also the chance to become a global leader in stem cell therapies, thrusting South Africa to the forefront of the medical community and helping its people live healthier lives.

None of this is possible if the current draft of the National Health Bill becomes law. Therefore we ask the government to rethink its position and opt instead for a permissive policy that protects the rights of South Africans while acknowledging the potential benefits of this research. It is an opportunity South Africa cannot afford to miss.

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