

Stem cell research engenders interdisciplinary collaboration in science, ethics and religion

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Science has the potential to impact significantly on society, and the South African government's drive towards a knowledge-based economy aims to harness this potential. One example of particular interest is the field of stem cell therapy. Although the field is likely to have a significant impact on health care, it is intrinsically fragile. This fragility results from the convergence of science, ethics and religion around issues such as the origin of life – in the case of embryonic stem cells. In addition, there is a lack of concordance between the rapid rate of technological innovation on one hand and the implementation of appropriate legislation on the other. Appropriately focused interdisciplinary collaborations are necessary to avoid the negative consequences of this fragility. The joint conference co-hosted by the Vatican and NeoStem, an American-based international biopharmaceutical company, held in Rome in November 2011, is an important step in this direction.

Stem cells are the building blocks from which all the different cells of the body are derived in response to a finely orchestrated series of chemical and mechanical signals. Stem cells have been used successfully for several decades to treat patients with a variety of diseases, and their future potential as therapeutic agents has opened up an exciting new field in medicine. In order to harness the full potential of this rapidly growing field it is important for the diverse disciplines implicated therein to align their goals and values. Stem cells and their application in 'personalised medicine' extend far beyond the disciplines of medicine and pharmacology. There are humanitarian, social, ethical and religious concerns that will arise from developments in this field, and to ignore their impact on our communities would be to the detriment of all concerned. The establishment of interdisciplinary networks is necessary in order to retain, and even accelerate, the current momentum of research and to ensure that therapeutic benefits and patient safety are maximised.

The recent seemingly unorthodox collaboration between the Vatican and NeoStem is an example of the type of interaction between religion, science, medicine, bioethics, economics and philosophy that could pave the way for an interdisciplinary approach to stem cell research. This unusual collaboration made headlines last year when the Vatican donated \$1 million to NeoStem's Stem for Life foundation, the objective of which was to develop 'ethical stem cell research'. Although the worlds of science and religion do not necessarily oppose each other, the Vatican has not been seen as an unbiased partner with regard to its support for science, for example, the Vatican condemned Galileo Galilei as a heretic for his theories on the universe. Rev. Tomasz Trafny, a Polish-born priest, gave the *LA times* (20 October 2011) two reasons for the Vatican's interest in collaborating with NeoStem:

First, they [NeoStem] have a strong interest in ... searching for the cultural impact of their own work, which is very unusual. Many companies will look at the profit and only at the profit. And the second, of course, is that they share the same moral, ethical sensitivity.... Because of that ethical position, we entered into this unique collaboration.

NeoStem has interests in adult cellular regenerative therapy, both in harvesting and storing adult cell units as well as in manufacturing adult stem cell (ASC) therapeutics. At first glance, there are no specific qualities that distinguish NeoStem from other players in the ASC therapy field. Although NeoStem's interaction with the Vatican has met with some opposition, credit needs to be given for their creative approach to bridging the divide across disciplines. The reasons for NeoStem's collaboration may differ from those espoused by the Vatican. For example, there might be more to gain for NeoStem in the collaboration from a commercial perspective than the Vatican cares to admit. However, the collaboration was showcased under principles of morality and ethics, and although NeoStem will almost certainly benefit commercially, the focus was nonetheless on how to make stem cell therapies more ethical by focusing on ASCs rather than embryonic stem cells (ESCs).

The most widely publicised moral opposition to the use of stem cells comes from the use of ESCs. The Vatican's stance against the destruction of human embryos for the production of ESC therapies made them the perfect partner for NeoStem's ASC campaign. The Vatican is of the



opinion that destroying an embryo does not uphold the ethics that maintain respect for life, regardless of the stage of the embryo's development (Pope Benedict XVI, 2006) and therefore gladly support NeoStem's alternative 'ethical stem cell research' which is limited to ASCs. Public awareness of ASCs is very limited to say the least, and their current and potential future applications are not well understood.

The Vatican-NeoStem joint conference strongly promoted the potential therapeutic applications of ASCs and the impact that cell-based therapy will have on society's social, cultural and religious interactions. Although a limited number of new insights were offered at the conference, various kinds of ASCs and their potential therapeutic applications were presented as better 'ethical alternatives' to ESC therapies. Current misconceptions regarding ASCs were discussed together with patient testimonials that highlighted several successes in ASC therapies. Speakers strongly contrasted the apparent moral and ethical high ground of ASC therapies to those of ESC therapies. Reasons for the Catholic Church's support for ASCs were given from a theological, philosophical and humanitarian point of view, with emphasis on the moral and ethical responsibility that scientists have towards society. In short, the public platform created by the conference was cleverly utilised to convey the scientific message of 'adult stem cell hope' (although inevitably mixed with a little 'stem cell hype').

The translation of innovation in the fields of science and medicine into therapeutic products – also known as translational medicine – has revolutionised the way scientists view modern medicine and health care in general. Despite opposition, the Vatican ventured into the stem cell arena, attempting to address preconceived misperceptions about their support for regenerative therapies. By backing NeoStem, the Vatican showed their support for regenerative therapies using ASCs instead of ESCs. To the Vatican's credit, they have realised that in our modern society, the church cannot afford to stagnate or to be indecisive. Modern-day believers are increasingly confronted with how to marry their belief with scientific progress. This dilemma becomes more difficult when religious beliefs are contrasted with developments aimed at alleviating human suffering. The church thus needs to provide a solid foundation for dealing with contemporary issues.

Despite the obvious marketing benefits to NeoStem, the company used the Vatican as the 'moral microphone' through which to market their ASC therapies to the religious masses. They hoped to reach people who have been confused by ethical concerns and debates surrounding ESCs and who as a consequence have avoided the stem cell arena altogether. NeoStem appears to have wanted to raise public support for the use of ASCs by pacifying concerns related primarily to ESCs and by placing the Vatican's 'religious stamp of approval' on their progress, as articulated by their chairman Dr. Robin Smith: 'It's like when you have the Good Housekeeping seal of approval, this is the Vatican seal of approval.'

Even though their motives were probably less altruistic than claimed, there is a lot to learn from the Vatican-NeoStem interaction. The conference and the ideas that emanated therefrom emphasise the need for a holistic approach to science and by scientists in our community and the world. Philosophical questions regarding human existence and suffering continue to challenge our implied and expected ethical and moral responsibility, requiring scrutiny and dissection of our own motives, agendas, values and beliefs.

Can science and religion truly find common ground as partners in a mutual effort to find cures to alleviate the suffering of many? The Vatican believes they can, on condition that life is sustained and improved without compromising social and scientific integrity and clearly defined ethical and moral principles. We believe that science and religion should complement and strengthen each other and that interdisciplinary collaborations are required to bring a holistic view to an increasingly interconnected world. However, for someone with a different world view, this might not hold true and in that regard, compromise can only extend so far. Certain core values and beliefs are irreconcilable because those values often define an entity, and compromising those values will necessitate a change in identity, giving rise to a loss of character which few are willing to accept.

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