

## TERMINOLOGY, PROCEDURES AND SEMANTICS EXPLAINED

There are many terms used in science where the meaning differs to the word's common use in language. For example I was described as an "elderly primigravida" when I gave birth to my daughter at a shade under 30. The term "elderly" conjures up a picture of white haired grannies. This medical term was used to alert the doctor to perceived problems women may have when having their first baby at an older age. Trends in reproduction have changed and the term Elderly Primigravida, when a doctor is game to use it, now applies to women over 35 and with the advent of genetic testing has largely lost its purpose. Science needs to be constantly reviewing its terminology, finding more accurate and less ambiguous terms. There are other terms that seem harsh eg embryo harvesting.

Both sides of this debate blame the other for using semantics and words to cloud the issues. Spin is something science should never get involved in. Largely scientists are not good at it. However in this debate the moral objectors have accused them of it. One may be forgiven for asking whether this is a case of the proverbial pot calling the kettle black.

The definition of term embryo is a good starting point. Is an embryo as person? According to Fr Kevin O'Rourke at the International Congress on Bioethics in the Philippines in December 2005 the answer is unequivocally yes. However he admits "*convincing our peers will be difficult*" but that as a member the pro life movement "*convincing the public that life starts at fertilization is our mandate, our debt to humanity*" <http://webservice.mnl.ust.edu.ph/bioethics/absComment.asp?RecNo=6> . Some argue that is the definition of fertilisation may even be debatable in the context of this research with regard to **Somatic Cell Nuclear Transfer**.

Arguments put by antagonists of Embryonic Stem Cell research over the veracity of the terms **Reproductive Cloning** and **Therapeutic Cloning** has resulted in some confusion and whether or not the intention, a diversion from the core issues. Kathleen Wolf, the spokesperson for the Australian Federation of Right to Life Associations was quoted in the online news magazine Australian Biotechnology News as saying

*"Therapeutic cloning is a bit of a presumption. Scientifically it doesn't exist. Either you're cloning to make an embryo or you're not. The purpose of it is in the mind of the scientist doing the cloning. I just can't see that you could ever say one human being -- no matter what the stage of development is fodder for experimentation,"*

The first part of her comment is valid, that its all in the terminology, and maybe the choice of words was poor. The terms are meant to simply distinguish the act of cloning for the purpose of creating a complete being ( Reproductive Cloning) from cloning for the purpose of treating disease through either growing tissue or testing drugs and other treatment (Therapeutic Cloning). Both outcomes use the same process - **Somatic Cell Nuclear Transfer (SCNT)**. Indeed the (in)famous example is **Dolly the Sheep**. A pivotal thing to remember when hearing this being used as an argument against this procedure is that no one is proposing to legalise cloning complete beings.

Now, more and more, people are using SCNT in place of reproductive and/or therapeutic cloning as the preferred term for this amazing piece of technology. SCNT is the process whereby the nucleus of a human (or animal) egg is removed. And the nucleus of a **somatic cell** (a cell of a complete being other than an egg or sperm) is removed and inserted into the enucleated egg. The nucleus of a **germ cell** ( ie an egg or sperm ) contains half of the genetic information required to create a complete being. The nucleus of a somatic cell contains the full complement of genetic material. Somehow the placing of the somatic nucleus in to the enucleated egg triggers the egg cell to divide and develop. If implanted into a uterus it would theoretically produce an identical clone of the person who donated the somatic nucleus. However, As long as the cells are not implanted in to a human uterus and are treated like other cells in embryonic stem cell research where the inner cell mass is extracted early in development and the outer casing discarded they will not be able to develop into complete beings. However this SCNT research, which is currently illegal, is possibly the most exciting of all the embryonic stem cell research areas because any tissue grown through this technique should be genetically effectively identical to the nucleus' donor. So this means that tissue generated this way could potentially be used to replace defective tissue or organs in people. It may be as simple as taking a tiny sample of skin to produce a donor nucleus which is implanted

into a host egg that has been donated by someone else who may be , a friend family member or even a stranger. The miracle is that this tissue, being identical to its nucleus donor will not have the issues associated with rejection usually associated with organ transplantation . Egg donation would be consensual , either through a bank system or by family members donating.

It has also been proposed to use animal host eggs to grow the tissue in. While those against embryonic stem cell research say this is unnatural because it is mixing the genetic material of separate species. Surely this is really only be an issue if there was an attempt to create a whole being because the practice of placing using animal cells in people is not new . We grow vaccines in chicken eggs then inject them into people. We transplant animal heart valves into people with defective circulatory systems saving their lives. We use horse oestrogen to treat hormonal problems in women and diabetics inject insulin from pigs every day to control their condition.

As for the second part of Ms Woolf's objection to SCNT, in the same article, Dr Brigid Vout from the Life Office of the Catholic Archdiocese of Sydney puts a creative spin on these terms by stating *"Therapeutic cloning certainly isn't therapeutic for the embryo that is produced, commodified and then destroyed for its stem cells,"*

She is further quoted as saying *"all human cloning gives rise to a living human embryo"*. Allowing SCNT research to develop "embryos for 14 days would enable scientists to harvest pluri- and multipotent cells, without permitting anyone to clone a complete human being. This process would however result in the "death" of the "embryo" but no one would want this "embryo" to proceed. Again it is all about terminology . It could be argued that rather than embryo a more appropriate name for the entity that results from division of the SCNT cell might be "**cell mass**" because it is not really an "embryo" in the usual sense because

1. it never had potential to become a complete being as it will never be implanted in a uterus
2. it was never really "fertilised" in the human reproduction sense of egg meeting sperm..

If the Community did not recognise the cells that resulted from SCNT as a "human embryo" the moral argument against SNCT would be difficult to win. This is semantics at work, but on both sides.

All SCNT is currently illegal in Australia, but The Lockhart review has recommended it should be legalised with strict provisos that include restrictions that development should not progress beyond 14 days and that the cell mass is not to be implanted into a uterus.

Some, like the Minister for Health, Tony Abbott, argue that any liberalisation of the Cloning laws would pave the way for eventual cloning of complete beings. But this is illogical. Each time a change in the law was proposed it would need to go through the usual parliamentary process. To reject thoughtful recommendations like those in the Lockhart review on the basis of the potential for other changes to be proposed in the future is ludicrous.

Of course, the pivotal issue or all Embryonic Stem Cell research remains the illusive key to cell control. If, or hopefully when, scientists are able to unlock the mystery of how to steer a pluripotent cell to become a particular specialised cell the potential means of alleviating suffering for millions of human beings will follow. Will those people who object to Embryonic Stem cell research reject the therapies it may produce?

A major stumbling block for the stem cell debate is the notion of "when life begins". While it is unlikely there will ever be consensus on an answer to this question the moral debate continues to hold up scientific endeavour. People deserve to be respected for their moral stance on this issue however they must also be truthful when debating the issues and let the community decide its position based on fact. Importantly it is the whole Community, not minority moral groups or individual politicians who should decide important issues like this.