

Cloning – Should it be banned

Introduction

The cloning debate began almost immediately when Scottish embryologist Ian Wilmut and his colleagues managed to create a frisky lamb named Dolly scoring an advance in reproductive technology as unsettling as it was startling. Although Wilmut et al. struggled for more than 10 years to achieve their breakthrough, it took political and religious leaders around the world no time at all to grasp its importance: if scientists can clone sheep, they can probably clone people too. This article attempts to provide a perspective on some of the contentious issues at stake.

CLONING - the technology

To clone Dolly, Wilmut and his colleagues took a mammary gland cell from a six year old sheep and by depriving the cell of nutrients in the laboratory put the cells DNA into a semi-dormant state. Wilmut then removed the nucleus of a sheep egg cell taken from a different ewe



and inserted the mammary cell into the now nucleus free egg cell. Wilmut then gave a jolt of electricity to the two combined cells and the combined cells acted like a fertilised egg cell and began to divide using the DNA from the mammary cell as its genetic blue print. He then implanted

the now developing embryo into another ewe and in a few months Dolly was born an exact genetic copy of the ewe from which the mammalian cell had been taken.

Cloning - the promise

The research has major implications beyond the cloning issue, for it addresses a longheld central tenet of biology that

once a cell differentiates into a specialised function(skin, nerve, heart cell, etc.) there are irreversible changes to the genome which stops it reverting to a non differentiated state.

Wilmut et. al. believe that a limited amount of cloning could speed up the process of producing new breeds of sheep and other farm animals with improved characteristics such as leaner meat and producing more milk or wool. It might also be possible to knock out genes or other factors such as prion protein which has been associated with Bovine Spongiform Encephalopathy (BSE).

Embryonic cloning could be valuable tool for genetically modifying embryos and investigating new transplant techniques. Two sheep 'Polly' & 'Molly' have been genetically engineered to produce milk containing gene to produce factor IX (a blood clotting factor, used in the treatment of Christmas disease) that should help haemophiliacs. In the field of transplantation, animal organs could be coated with certain proteins that 'fool' the human immune system into believing that the foreign organ is its own. These techniques hold the promise of revolutionary medical progress in the field of vaccines and life saving cure for diseases such as cystic fibrosis, diabetes and cancer. Good news for animal lovers would be that endangered species of animal could be cloned and thus their survival could be ensured.

CLONING - the controversy

So how were these findings received? They were met with an avalanche of publicity, with commentators of every persuasion, from heavy weights like the U.S. President, the WHO, the European Parliament and Vatican, to columnists from the lay press and populist scientists, giving their views on the ethical and moral implications of the research, virtually all of which addressed the extension of the research to humans, with little being said of its potential benefits.

*Courtesy
Current Medical Scene
(Volume 12, No. 4, 1997)*

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The Vatican said, "The world has a duty to protect not just the sanctity of human life but also that of animals. Cloning goes against the creative plans of God, the dignity of the person and of marriage". The U.S. President and the WHO announced that they considered the cloning of humans to be ethically unacceptable. And the anti-cloning lobby received a further fillip recently with the announcement by an obscure american physicist-Richard Seed that he is ready to start cloning humans within 18 months. The most distasteful suggestion was the brain dead clones could be used as handy repositories of matched healthy tissue.

However the objections of most people arises from a gut feeling that it cannot be good to go so blatantly against the natural order especially when the point of doing so is had to see. and people are entitled to ask when a new technology comes along, Why nature's familiar patterns need to be disrupted. The motives of the infertile couple that uses technology to produce a child are one thing those of the parent who wants a clone of himself is something altogether repugnant.

CLONING – a perspective

The underlying fear appears to be that human clones are just around the corner. However a reading of the Nature paper in which cloning was described, and an accompanying editorial, shows just how preliminary the research is, and just how it might be difficult and cumbersome to extend research to humans. Indeed even agricultural and biomedical application of this technology could be years away. This

is because the technique is not yet fully safe and Dolly was the only success out of 277 tries. The most impressing questions are about Dolly's health. Though she appears fine now, it is possible that dolly may not live as long as other sheep, because she comes from a six year old cell and could display signs of premature ageing. Additionally cloning sometimes irreversibly damages the DNA.

Missing from much of the debate was recognition that Dolly was not an exact clone; part of her genetic material came from mitochondria left in the cytoplasm of the oocyte, which are important in the ageing process. And as many point out cloning already exists in the form of identical twins. But even here, twins grow up to be separate individuals with their own talents, likes and dislikes, Genes contribute only a certain proportion of an individuals make up.

Conclusion

Transgenic technology has been around for the last twenty years, but no clinician has been foolish enough to experiment with human germ cell therapy. However this technology does raise some legitimate questions about the choices of parents and the welfare of children and hence some ethical accommodation may need to be reached in the future.

To conclude, the cloning of a living being is a monumental breakthrough for the human race and the vast medical benefits alone justify continued investment in this fascinating and exciting new technology.

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