



# Embryology

## General Election 2017 Policy Paper

### Background

Medical research is changing as scientists develop therapies that can change the quality of life of many who suffer from debilitating illnesses. However, medical researchers are still obligated to adhere to ethical principles in the development of these therapies. Since the Human Fertilisation and Embryology Act 1990 and subsequently the Human Fertilisation and Embryology Act 2008, the UK has developed procedures and techniques that cross crucial ethical boundaries.



### Adult stem cell research vs. Embryonic stem cell research

The Human Fertilisation and Embryology Act 1990 legally permitted the creation and destruction of embryos for research purposes. The creation of human embryos for any purpose other than life raises very serious ethical questions in relation to the status of the embryo and calls into question when human dignity can be attributed to life. From 1991 to 2015 over 4 million embryos were created with 2.3 million embryos were discarded.<sup>i</sup> The destruction of human life should never be tolerated as a means to an end. The creation of embryos simply for research purposes only to be destroyed later, grossly abuses the sanctity of life.

Those in favour of destroying embryos for research purposes often state that this destruction is necessary to advance stem cell research. For example, some scientists suggest that if governments permit the carrying out of embryonic research, they will be able to develop cures for a variety of different diseases and ailments<sup>ii</sup>. However despite research over many years not a single therapeutic application has resulted from human embryonic stem cell research (although there are a tiny number of clinical trials currently under way).

In contrast, adult stem cell research has been used to develop more than seventy five diseases ranging from Lupus<sup>iii</sup> to Chronic Leukaemia and Inherited Immune System disorders<sup>iv</sup>. Adult stem cells can be harvested from a variety of different sources such as bone marrow; blood in the umbilical cord; cartilage and fat and crucially, their collection does not involve the destruction of human embryos.<sup>v</sup>

Despite evidence revealing that Adult stem cell research has produced multiple therapeutic applications while human embryonic stem cell research has not produced even one licensed therapy, government funding does not reflect this. Between 2002 and 2010 funding for both adult and embryonic stem cell research continued to be split between these two types of research.<sup>vi</sup> Had the £105 million invested in human embryonic stem cell research during this period instead been invested in adult stem cell research it is very probable that we would have access to more

cures today and that less people would be sick. Given the evidence, it would seem both scientifically logical and more ethically sound to shift funding towards adult, rather than embryonic stem cell research.



### Animal-Human hybrids

The Human Fertilisation and Embryology Act 1990 as amended by the 2008 Act also opened up the possibility of further experimentation on other types of embryos; notably animal-human hybrids. Animal-human hybrid embryos are embryos that have been mixed with another species; either by placing the nucleus of one species with another or by mixing animal sperm or eggs (gametes) with human gametes in the hope that this technique will help scientists develop therapies that will treat diseases. Scientists suggested that animal-human hybrids would deal with the shortage of human eggs that exists in relation to research.<sup>vii</sup> The Academy of Medical Sciences, the Royal Society, the Wellcome Trust and the Medical Research Council said that the creation of hybrids:

*“Is one important option to overcome the limited availability of donated human eggs – one of the major barriers to embryonic stem cell research.”<sup>viii</sup>*

The use of animal-human hybrids was also supported by parliamentarians both in the House of Lords and in the House of Commons. Dr Evan Harris in the House of Commons stated that:

*“If one asks authoritative groups of people, who study the matter in scientific committees—the Academy of Medical Sciences, the Royal Society, the Medical Research Council, the Wellcome Trust and the medical research charities, which jealously guard the money that they raise and do not want to waste it on useless treatments—one finds that they all support the research.”<sup>ix</sup>*

Also in the House of Lords, Lord Darzi who was the Parliamentary Under Secretary of State stated that:

*“We need to open up this area of research to scientists in the hope of developing knowledge about disease, of discovering new ways of treating and perhaps even of curing serious disease and medical conditions affecting the quality of life of countless people worldwide.”*

This type of research raised ethical concerns in relation to what it means to be human; particularly when our faith tells us that we are made in God’s image. Despite the fact that scientists said changing the law to permit of the creation of animal-human hybrids was vital, in 2009 animal-human hybrid techniques were dropped and the three scientists that were working in this area have all abandoned this type research. This is because funding organisations decided to focus instead on reprogramming adult stem cells to give them the properties of human embryonic stem cells, something that CARE advocated as an ethical alternative throughout the hybrids debate.<sup>x</sup>

## Embryology in the 2010-2015 Parliament

### Three parent children

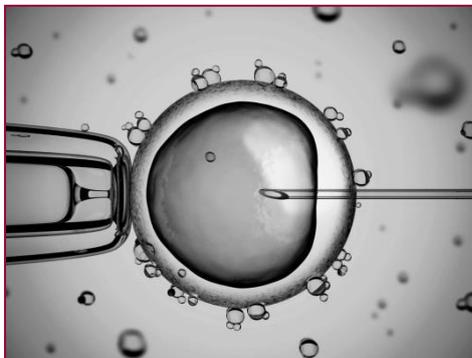
Towards the end of the 2010-2015 parliament Regulations were approved to permit mitochondrial replacement therapies through the use of IVF. It is hoped that the procedures, which will result in the creation of children with three genetic parents, will help to prevent the transfer of human mitochondrial disease from one generation to the next.



#### *What does mitochondrial replacement therapy consist of?*

Mitochondrial replacement techniques involve taking the egg of a mother with damaged mitochondria and collecting a donor egg with healthy mitochondria. Doctors would then move the nucleus of the donor's egg and insert the mother's nucleus in its place. So-called mitochondrial replacement therapies (it is actually the nuclear DNA that is replaced) include two techniques. The first; Maternal Spindle Transfer (MST) involves removing the faulty mitochondria from the mother's egg and replacing them with the donor's healthy mitochondria and then fertilising this new egg with the father's sperm. The second technique; Pronuclear Transfer (PNT) involves the father's sperm fertilising the mother's egg creating an embryo. The nucleus of this embryo is then removed and placed into the donor egg.<sup>xi</sup> These techniques are very controversial because they involve genetically engineering a human embryo with certain properties. Facilitating the creation of human beings who are in an important sense 'manufactured' rather than 'given' raises huge ethical concerns for anyone who believes that good social policy rests upon respecting the fact that human beings are made in God's image. While the Regulations only permit genetic engineering to address human mitochondrial disease and not to select for e.g. hair or eye colour, they set an important precedent and less than three days after the vote people were already calling, as CARE predicted, for the more widespread genetic engineering of human beings.<sup>xii</sup> The Pronuclear Transfer technique in particular, is also controversial because it would involve the creation and destruction of at least two human embryos for every wanted human embryo.

#### *Debates in the House of Commons and House of Lords*



The Regulations were debated in both houses in February 2015. In the House of Commons concerns were raised in relation to the safety of these techniques with some MPs suggesting that mitochondrial replacement therapies involve the permanent alteration of future generations.<sup>xiii</sup> Whilst in the House of Lords concerns were raised on both safety and legal grounds, with some peers questioning whether the Regulations comply with EU law.<sup>xiv</sup> Despite these concerns, both houses voted in favour of making the Regulations.

## Embryology in the 2015-2017 Parliament

During the 2015-2017 Parliament, there was very little legislative activity related to embryology. However, a number of developments outside of Parliament are worth noting.

- In October 2015, the regulations governing the creation of three parent embryos in the United Kingdom came in to force. The UK became the first nation in the world to allow such embryos to be created.<sup>xv</sup> However, while the practice became legal it was not without critics. An article published in the scientific magazine *Nature* in May 2016 pointed out that the technique has the “potential to backfire.”<sup>xvi</sup> In September 2016, the first baby in the world to be created using this controversial technique was born. The procedure was conducted in Mexico and attracted considerable comment from around the world.<sup>xvii</sup>
- In May 2016, it was announced that for the first time scientists have now grown embryos for research purposes up to 13 days after fertilisation.<sup>xviii</sup> Unsurprisingly, soon after calls were made by some researchers in the field for the 14 day limit to be reviewed so that embryo research could be conducted beyond 14 days.<sup>xix</sup> We at CARE strongly oppose any extension to the 14 day limit.<sup>xx</sup>

## Embryology in the coming Parliament – pressures for change

More needs to be done to:

- Prevent the destroying of human embryos for research purposes
- Ensure that funds are reallocated from human embryonic research to adult stem cell research
- To press for the repeal of the animal – human hybrid legislation that is now not used
- To press for the repeal of the new three parent children Regulations
- Oppose the extension of the 14 day time limit on embryo research.



## Key questions for candidates

1. Do you think creating and destroying human embryos for research purposes is ethical?
2. Would you commit to campaign for the reallocation of all funding on human embryonic stem cell research, which has so far involved the destruction of over 1.6 million human embryos, to adult stem cell research, which has so far given rise to 75 therapies?
3. Will you commit to repealing the legislation that permitted animal-human hybrids?
4. Will you commit to repealing three-parent children Regulations, which some are already asking to be made more widely available?



<sup>i</sup> Lord Alton, Parliamentary Question, 22 November 2016, <https://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Lords/2016-11-08/HL3075>

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