

Ethics of mitochondrial replacement



This past February, the UK parliament passed a law permitting mitochondrial replacement, making the UK the first country in the world to approve this technique. Mitochondrial replacement involves removing the nucleus from one egg that contains defective mitochondrial DNA and transferring it into the cytoplasm of another egg from a different woman with normal mitochondrial DNA but with its nucleus removed. Thus, fertilized eggs using this technique are described as “three-parent babies.” Because mitochondrial DNA is always acquired from the mother, mitochondrial replacement offers the best method to date to protect the offspring from mitochondrial DNA defects. However, the ability to prevent a disease from passing specific DNA to offspring has spurred the slippery slope argument about what constitutes acceptable intervention.

Mitochondrial replacement can be seen as a derivation of in vitro fertilization (IVF), which also was once a fascinating and maybe frightening experiment. Since its invention, however, there exist millions of IVF babies, and newspapers around the world celebrated the 35th birthday of Louise Brown, the first IVF baby, two years ago. Nevertheless, mitochondrial replacement does demand we evaluate what is permissible in reproduction science. The manipulation of DNA argues that we are creating designer babies. Designer babies normally spark images of parents selecting a desired height or desired hair/eye colour for their child, but what if we could modify an obesity gene or a dyslexia gene? The faulty mitochondria avoided by mitochondrial replacement can lead to many diseases and is associated with lower life expectancy. Yet so too does obesity, and learning disabilities also have possible detrimental effects on life.

In Japan, there is at the moment no discussion about permitting this technique. However, like IVF, that might change once we see the implications on people’s lives. If mitochondrial replacement shows health benefits that dwarf ethical concerns, Japan and many other countries may begin at least reassessing their position.

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