“Three-parent Children”: Ethical questions

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Surrogacy and Markets

- Difference between ascribing market value AND non-market value to a good VS ascribing pure market value
  - Examples?
- The liberal state should be neutral with respect to personal values
  - Some do not form strong attachments to the children they gestate
  - Some place high value in aiding others to become parents
- We can minimize worries about exploitation through various strategies
  - Have a 'cooling off' period
  - Regulate the industry
- Emotional attachment ?
  - Hazard of the job

Surrogacy and Markets

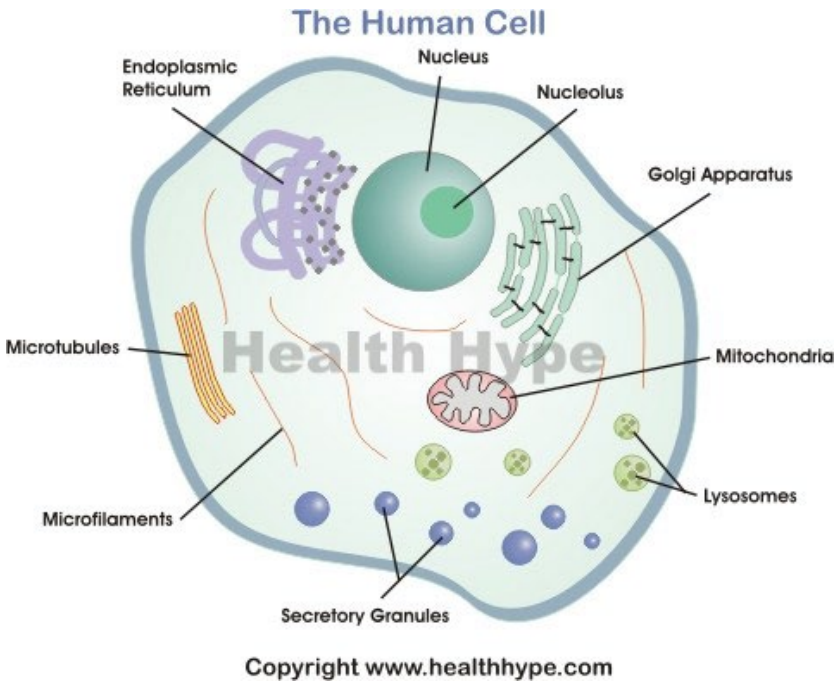
- Are we really commodifying children?
- If anything we are commodifying parental standing
- Baby selling?
  - Children are not being treated like property
  - While there might be *some* attachment, it is weaker than that formed through the formation of post-natal parental bonds

Overview

1. Background Biology
2. Mitochondrial replacement therapy and non-identity
    1. Why might it matter?
    2. Why might the techniques be different
3. Does the argument work?

Background: Biology

We are generally familiar with the DNA that resides in the nucleus of cells, but mitochondria, a cellular organelle, have their own genome



Background: Biology

The mitochondrial replacement therapies replace mitochondria (including mtDNA) from the ovum with diseased mitochondria with the mitochondria (including mtDNA) of a donor.

The resulting child thus inherits DNA from three individuals:

- Nuclear DNA from sperm
- Nuclear DNA from the ova of the person undergoing the treatment
- Mitochondrial DNA from an ova donor

This is where the media phrase ‘three parent’ babies comes from

Background: Biology

CNN


'Three-parent' babies: UK clinic gets OK for groundbreaking technique

By Laura Smith-Spark and Meera Senthilingam CNN

Updated 9:45 AM ET, Thu March 16, 2017

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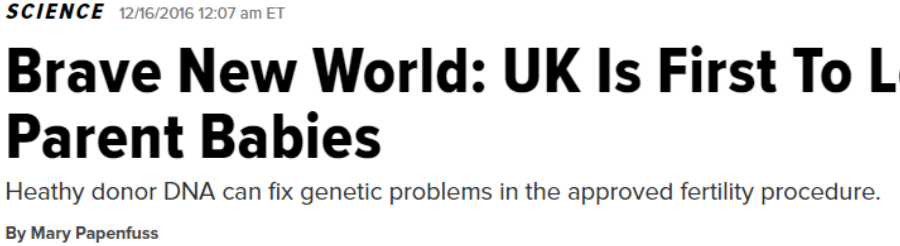

SCIENCE 12/16/2016 12:07 am ET

Brave New World: UK Is First To Legalize Three-Parent Babies

Heathy donor DNA can fix genetic problems in the approved fertility procedure.

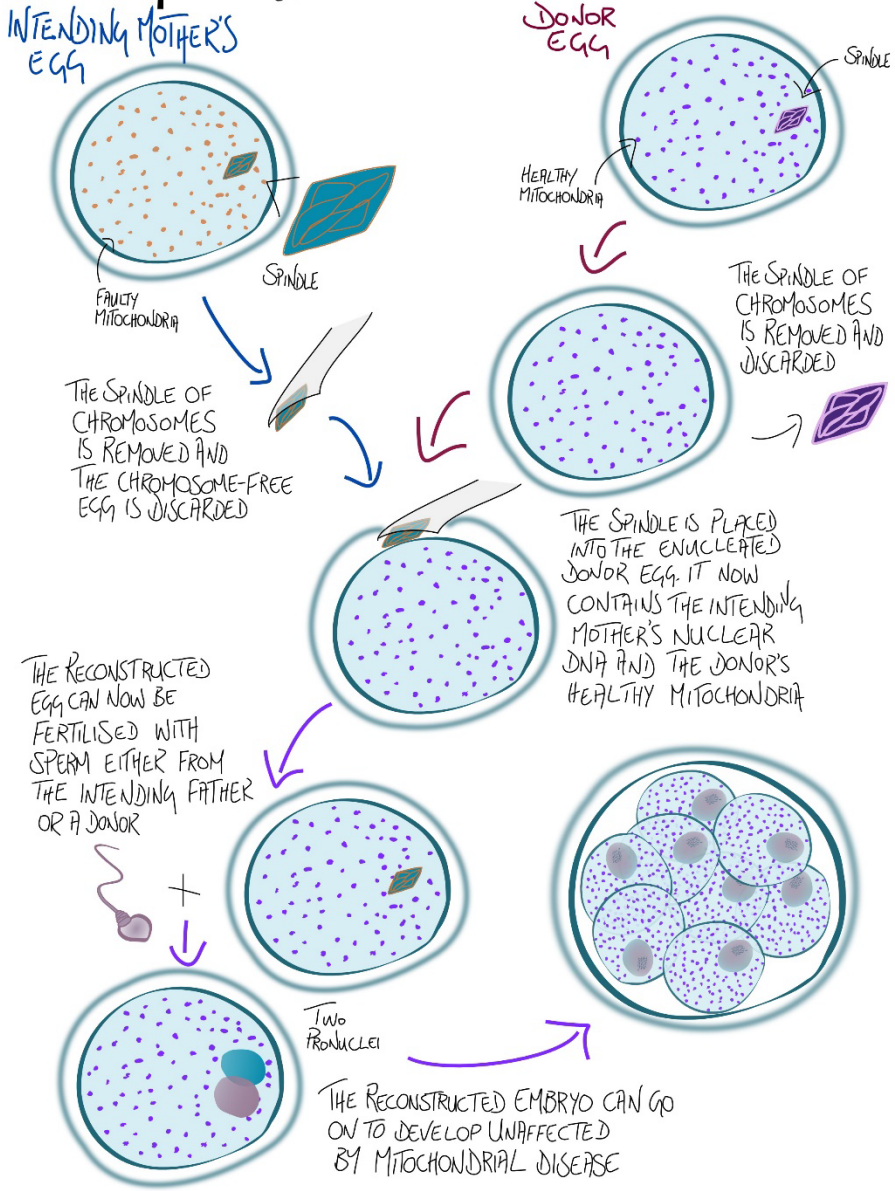
By Mary Papenfuss

Fox

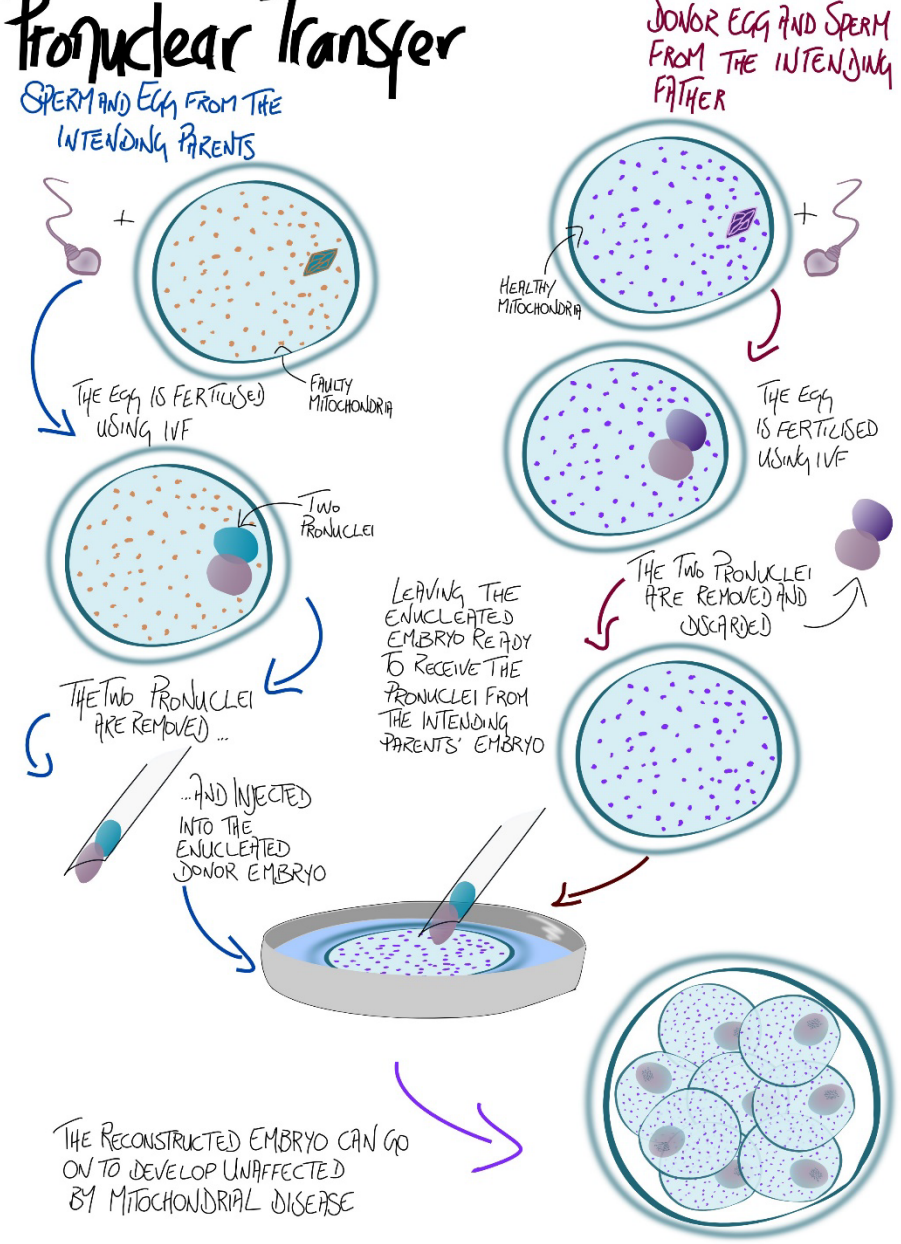

REPRODUCTIVE HEALTH

Controversial 'three-parent baby' fertility technique takes off in Mexico City

Maternal Spindle Transfer



Pronuclear Transfer



Background: Biology

Key differences:[1]

	nDNA	mtDNA
Size/location	Nucleus, 20,000 – 30,000 genes	Mitochondria, 37 genes
Ubiquity of gene products	Universal	All but one constrained to mitochondria[2]
Copies per cell	1	1000s
Inheritance	Paternal and maternal	Strictly maternal*
Variation within organism	Almost none	Universal heteroplasmy[3]

1. Taylor, Robert W., and Doug M. Turnbull. "Mitochondrial DNA mutations in human disease." *Nature Reviews Genetics* 6.5 (2005): 389-402
2. Kariya, Shingo, et al. "Effect of humanin on decreased ATP levels of human lymphocytes harboring A3243G mutant mitochondrial DNA." *Neuropeptides*39.2 (2005): 97-101.
3. Payne, Brendan AI, et al. "Universal heteroplasmy of human mitochondrial DNA." *Human molecular genetics* 22.2 (2013): 384-390.

Some questions

- Is there an obligation to use a mitochondrial replacement technique?
- Is one form of the techniques more preferable to the other?

Why non-identity might matter

- Duty to treat illness vs select a child that is better off
  - It is uncontroversial that reproducers have a duty to treat illness!
  - If one form of treatment preserves identity, then we might think of it as prenatal *treatment* → Obligation
- Worries about genetic selection
  - If one preserves identity, then it isn't selection! It's treatment!

Are the two different with respect to non-identity?

- According to Wrigly, Apleby and Wilkinson, YES!
- PNT preserves identity!
  - We can choose to go through with the treatment or not
  - In either case the resulting person develops from the same chromosomes
  - Thus identity is preserved
- MST
  - Choice to use the treatment determines which gametes fuse, so we have a different person

But wait, there's more

- Lewens argues that matters are not so straightforward
- Think back to Parfit – why is the time dependency claim 30 days?
  - Indeterminate cases!
- Why think that it is chromosomes that matter?
  - Parfit's origins view is about gametes
  - Wrigley et all assume *chromosomal essentialism*
  - There are more to gametes than nuclear chromosomes
  - What about the other features of the donor ova in PNT?
  - → maybe both are identity-affecting!

But wait, there's more

- Lewens argues that matters are not so straightforward
- We can construct MST cases that are similar to PNT cases in terms of preservation of chromosomes
- So what is the takeway?

"A better line of argument, mindful of what we might call philosophical risk, goes like this. A philosophical conclusion with potential practical import should ideally be robust, in the sense that it follows from any of a variety of plausible premises. Failing that, if a conclusion with practical import follows only from one very specific set of premises, it is important to establish those premises to an adequate level of confidence."

Some other questions?

- Should we permit the treatment?
  - Is it an effective use of resources?
  - Does it overvalue genetic ties?