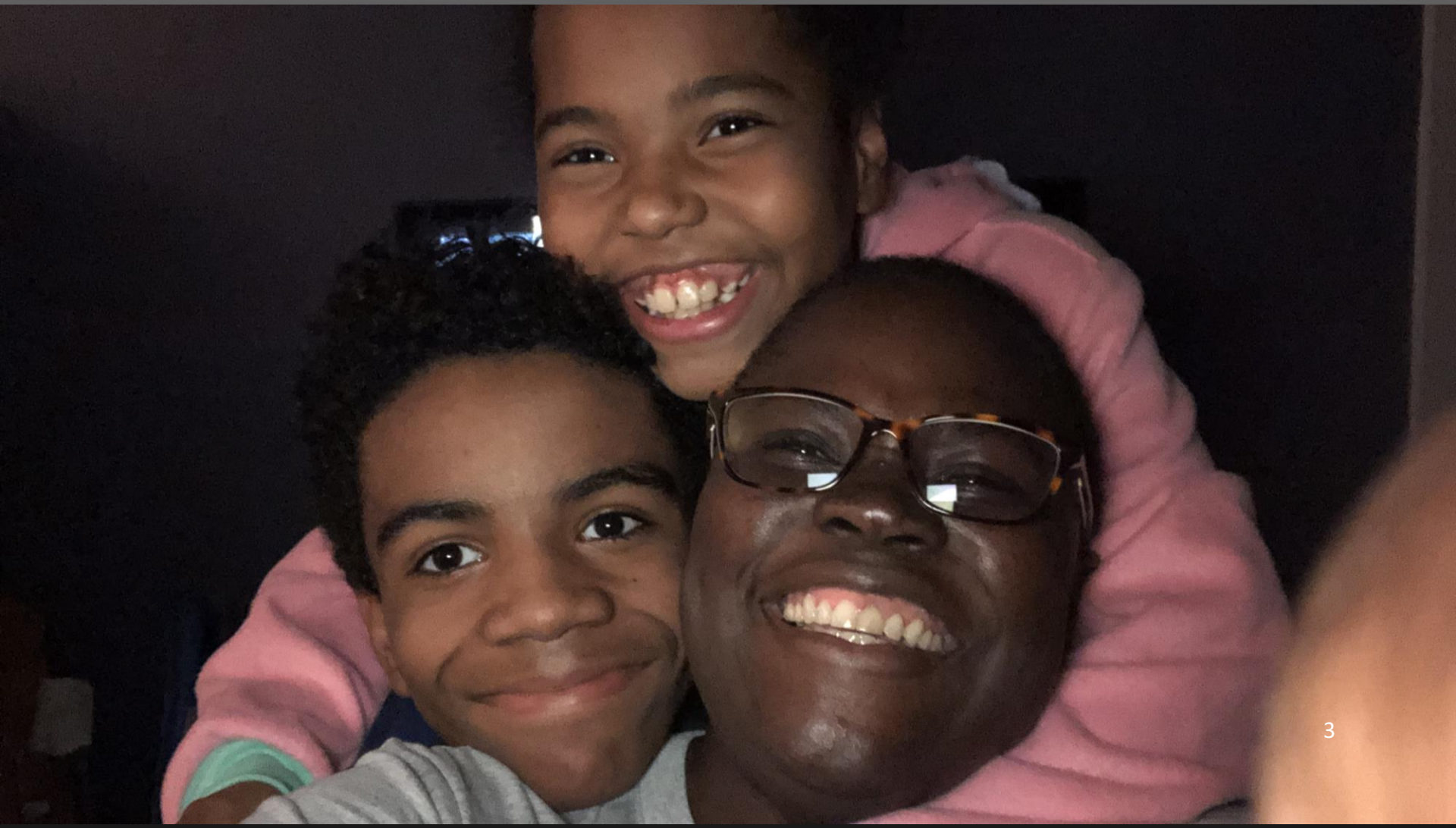
Public Procreation

April 6, 2019

Kimberly Mutcherson, Dean & Professor of Law

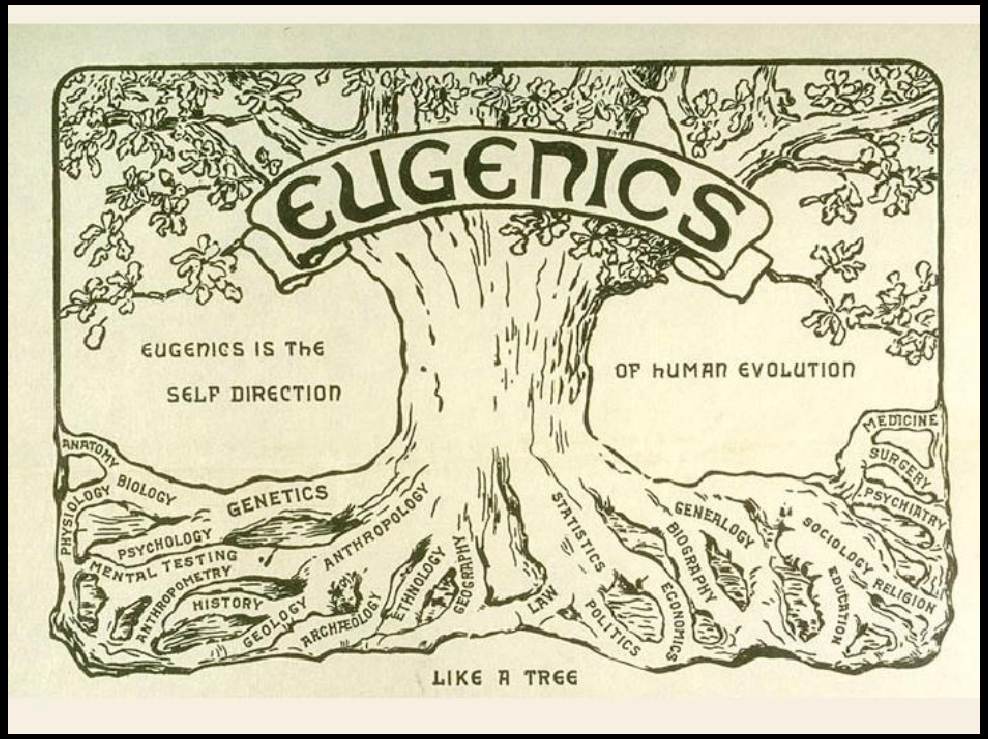
"A thing is valued . . . only if it is rare and hard to get."

- The Handmaid's Tale



Jack Skinner

- Marriage and procreation are fundamental to the very existence and survival of the race.
  - *Skinner v. Oklahoma*


EUGENICS
EUGENICS IS THE
SELF DIRECTION
OF HUMAN EVOLUTION
ANATOMY
BIOLOGY
PHYSIOLOGY
GENETICS
PSYCHOLOGY
MENTAL TESTING
ANTHROPOMETRY
ANTHROPOLOGY
HISTORY
GEOLOGY
ARCHÆOLOGY
ETHNOLOGY
GEOGRAPHY
LAW
STATISTICS
POLITICS
GENEALOGY
BIOGRAPHY
ECONOMICS
MEDICINE
SURGERY
PSYCHIATRY
SOCIOLOGY
RELIGION
EDUCATION
LIKE A TREE

Carrie Buck

- "Three generations of imbeciles are enough."
  - Justice Holmes, *Buck v. Bell*

The Relf Sisters

- "In no other area of medicine does the treatment of an ailment—in this case, infertility—call for the creation of another human being."
  - The President's Council on Bioethics, Reproduction and Responsibility: The Regulation of New Biotechnologies (March 2004)

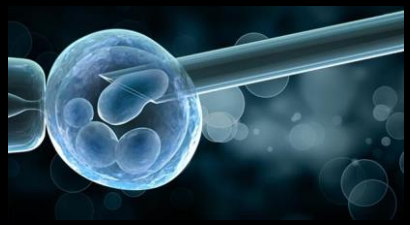
People are awful

People are curious (and maybe a little awful)

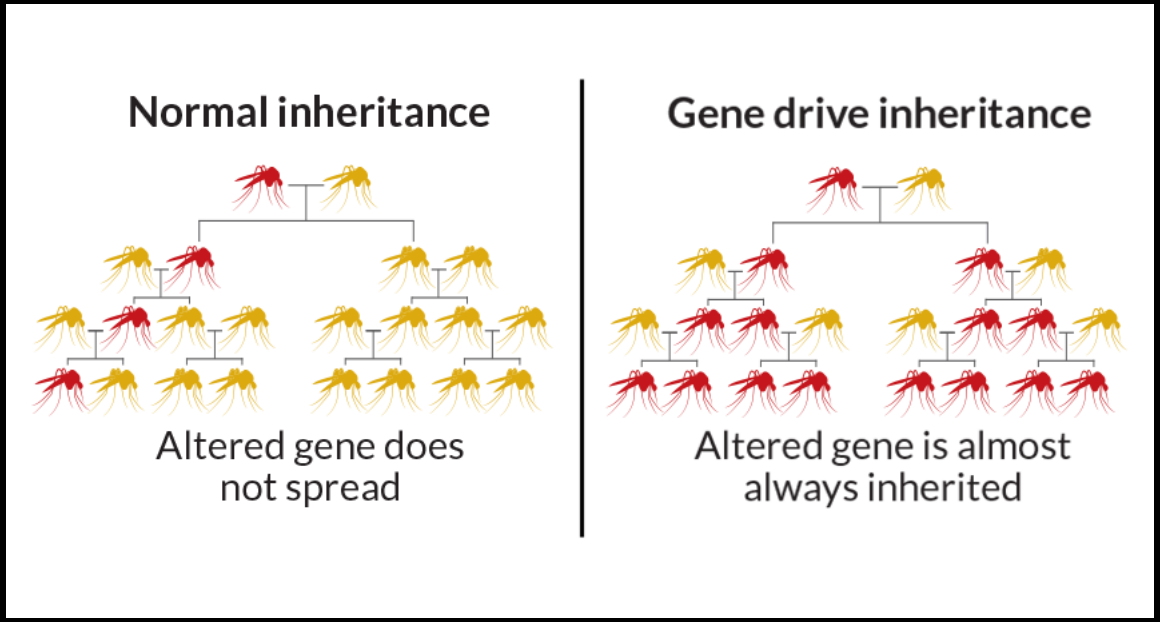
Making the babies we want

Preimplantation Genetic Diagnosis or Preimplantation Genetic Testing

- Screening test used to determine if genetic or chromosomal disorders are present in embryos produced through in vitro fertilization (IVF).



- CRISPR
  - Clustered Regularly Interspaced Short Palindromic Repeat.


Normal inheritance
Altered gene does not spread
Gene drive inheritance
Altered gene is almost always inherited

Dr. He & The CRISPR Controversy


Genetic revolution that can eradicate disease
'Jaw-dropping' breakthrough lets scientists delete faulty parts of the human genome
Discovery has potential for treating cancer, HIV, Down's syndrome and Huntington's
'A triumph with huge implications for science,' declares Nobel Prize winner

Parents can now pick a kid's sex and screen for genetic illness. Will they someday select for brains and beauty too?

Designer Babies

By MICHAEL D. LEMONICK

UNTIL JUST A FEW YEARS AGO, MAKING A BABY BOY OR A BABY GIRL WAS PRETTY MUCH A HIT-OR-miss affair. Not anymore. Parents who have access to the latest genetic testing techniques can now predetermine their baby's sex with great accuracy—as Monique and Scott Collins learned to their delight two years ago, when their long-wished-for daughter Jessica was born after genetic prescreening at a fertility clinic in Fairfax, Va.

And baby Jessica is just the beginning. Within a decade or two, it may be possible to screen kids almost before conception for an enormous range of attributes, such as how tall they're likely to be, what body type they will have, their hair and eye color, what sorts of illnesses they will be naturally resistant to, and even, conceivably, their IQ and personality type.

In fact, if gene therapy lives up to its promise, parents may someday be able to go beyond weeding out undesirable traits and start actually inserting the genes they want—perhaps even genes that have been crafted in a lab. Before the new millennium is many years old, parents may be going to fertility clinics and picking from a list of options the way car buyers order air conditioning and chrome-alloy wheels. "It's the ultimate shopping experience: designing your baby," says biotechnology critic Jeremy Rifkin, who is appalled by the prospect. "In a society used to cosmetic surgery and psychopharmacology, this is not a big step."

The prospect of designer babies, like many of the ethical conundrums posed by the genetic revolution, is confronting the world so rapidly that doctors, ethicists, religious leaders and politicians are just starting to grapple with the implications—and trying to decide how they feel about it all.

They still have a bit of time. Aside from gender, the only traits that can now be identified at the earliest stages of development are about a dozen of the most serious genetic diseases. Gene therapy in embryos is at least a few years away. And the gene or combination of genes responsible for most of our physical and mental attributes hasn't even been identified yet, making moot the idea of engineering genes in or out of a fetus. Besides, say clinicians, even if the techniques for making designer babies are perfected within the next decade, they should be applied in the service of disease prevention, not improving on nature.

But what doctors intend is not necessarily what's going to happen. Indeed, the technology that permitted the Collinses family to pick the sex of their child was first used to select for health, not gender per se. Adapting a technique used on livestock, researchers at the Genetics & IVF Institute in Fairfax took advantage of a simple rule of biology: girls have two X chromosomes, while boys have one X and one Y. The mother has only Xs to offer, so the balance of power lies with the father—specifically with his sperm, which brings either an X or a Y to the fertilization party.

As it happens, Y chromosomes have slightly less DNA than Xs. So by staining the sperm's DNA with a nontoxic light-sensitive dye, the Virginia scientists were able to sort sperm by gender—with a high rate of success—before using them in artificial insemination. The first couple to use the technique was looking to escape a deadly disease known as X-linked hydrocephalus, or water on the brain, which almost always affects boys.

But while the technique is ideal for weeding out this and other X-linked disorders, including hemophilia, Duchenne muscular dystrophy and Fragile X syndrome, most patients treated at Genetics & IVF want to even out their families—a life-style rather than a medical decision. The Fairfax clinic has been willing to help, but such a trend doesn't sit well with some other practitioners. "Our view at the moment," says Dr. Zev Rosenwaks, director of the Center for Reproductive Medicine and Infertility at Cornell Medical Center in New York City, "is that these techniques should be used for medical indications, not family balancing."

But now that parents know that the technology is available, and that at least some clinics will let them choose a child's gender for nonmedical reasons, it may be too late to go back. In a relatively short time, suggests Princeton University biologist Lee Silver, whose book *Remaking Eden* addresses precisely these sorts of issues, sex selection may cease to be much of an issue. His model is in vitro fertilization, the technique used to make "test-tube" babies. "When the world first learned about IVF two decades ago," he says, "it was horrifying to most people, and most said that they

WHAT PEOPLE THINK

If you could choose traits for your baby, would you choose to...

	Yes
Rule out a fatal disease	80%
Ensure greater intelligence	11%
Influence height or weight	12%
Determine sex	11%

Should parents with genetically linked diseases be required to test their children for them?

Yes 38% No 55%

Illustrations for TIME by John Craig

- Health and well-being of the human subjects directly affected by the biotechnologies.

- Justice and equality in the distribution of scientific advances.

This is Henrietta Lacks. Before her death in 1951, her doctor took and saved several tissue samples from her cervix without her permission or knowledge.

From these cells came the world's first "immortal cell line". Her cells have been used to develop everything from cloning to the polio vaccine. They have been used to develop cancer drugs, drugs to treat HIV, herpes, Parkinson's disease, and hundreds of others.

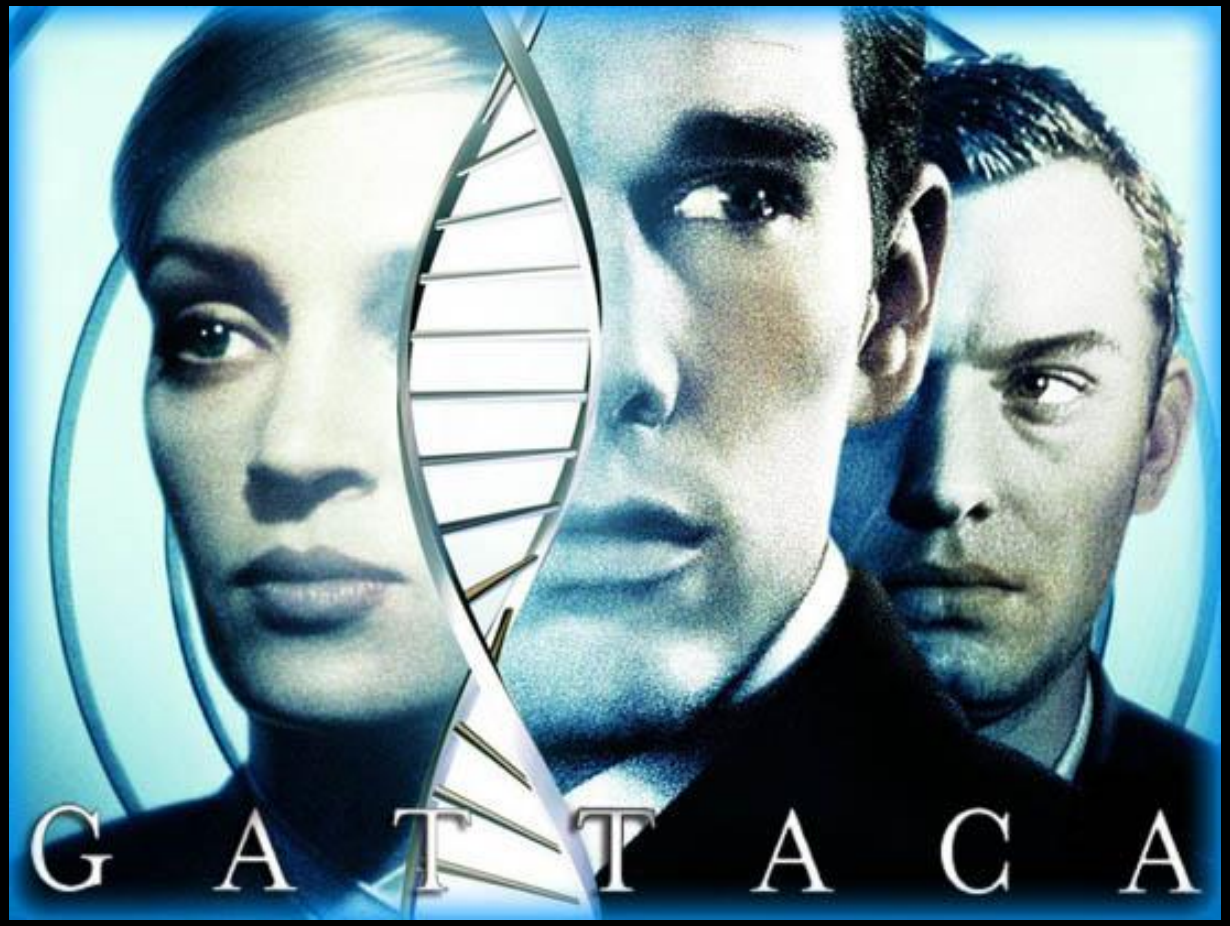
Scientists have grown more than 20 **tons** of her cells, and they're involved in more than **11,00 patents**.

- Perpetuation of negative attitudes toward disability and difference.

- Further commodification of reproduction

- Preserving the humanity of human procreation.
- "I exaggerate, but in the direction of truth, when I insist that we are faced with having to decide nothing less than whether human procreation is going to remain human, whether children are going to be made rather than begotten, whether it is a good thing, humanly speaking, to say yes in principle to the road which leads (at best) to the dehumanized rationality of Brave New World."
  - Leon Kass, *The Wisdom of Repugnance*.

Procreation without limits!


G A T T A C A

"Ordinary, said Aunt Lydia, is what you are used to. This may not seem ordinary to you now, but after a time it will. It will become ordinary."

- Margaret Atwood, THE HANDMAID'S TALE

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