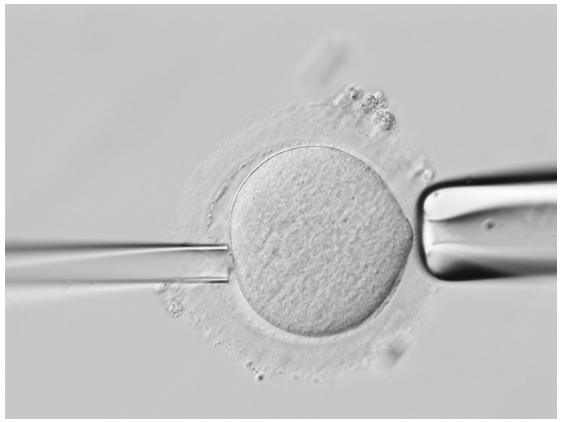

Microscopic image showing a nuclear genome being removed from a donor egg (oocyte).

Who is eligible?

Women who carry known harmful mtDNA mutations ages 18-37 years-old.

What is the cost?

Study-related procedures will be covered by the project. Travel-related expenses may be covered.

Contact Information

About Us

Columbia University Medical Center has internationally renowned experts in mitochondrial disease, stem cell biology, and IVF who are collaborating in this important research project to assess safety and feasibility of OMR. Investigators include Dr. Rogerio Lobo, MD, Dr. Dieter Egli, PhD, and Dr. Michio Hirano, MD.

Contact Us

Dr. Michio Hirano or Ms. Kristin Engelstad MS CGC

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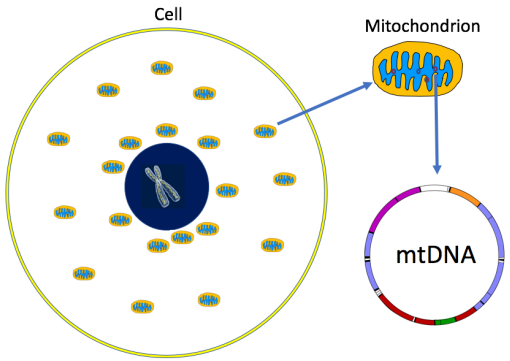
The Columbia Oocyte Mitochondrial Replacement Study (COMRS)

Investigating Oocyte Mitochondrial Replacement (OMR) to prevent transmission of mitochondrial DNA mutations

COLUMBIA UNIVERSITY MEDICAL CENTER

What are mitochondria and mitochondrial diseases?

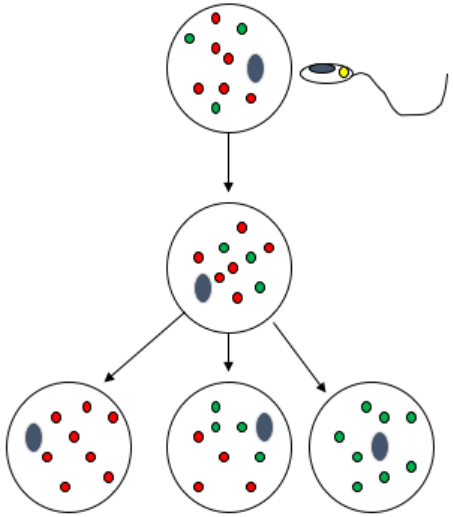
Often described as the powerhouses of cells, mitochondria are essential cellular components that produce energy. Virtually every cell in our bodies contain mitochondria, which have their own DNA: mitochondrial DNA (mtDNA), which is unique and separate from nuclear DNA (nDNA). Mutations in either mtDNA or nDNA can disrupt mitochondrial functions leading to diverse diseases that often affect multiple organs.



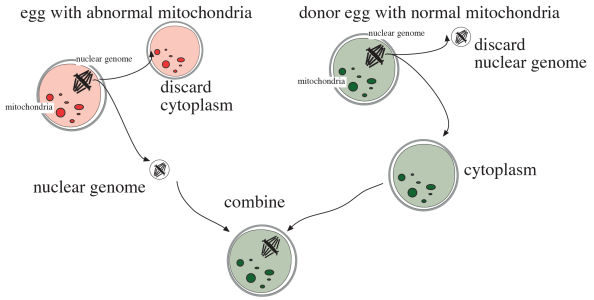
COLUMBIA UNIVERSITY MEDICAL CENTER

Understanding mtDNA mutations

Because mtDNAs are present in hundreds or thousands of copies per cell, the proportion (heteroplasmy) of mutant mtDNA can vary widely and can dictate the severity of a patient's mitochondrial disease. Another special property of mtDNA is its maternal inheritance; only mothers pass on their mtDNA to their children.



Oocytes (eggs shown as circles) containing a mixed population of mutant (red) and normal (green) mitochondria transmit mtDNA after fertilization to daughter cells.



Oocyte mitochondrial replacement

Our goal

To investigate the safety and effectiveness of Oocyte Mitochondrial Replacement (OMR) as means to prevent transmission of mtDNA to offspring.

What is involved?

Women who carry mtDNA mutations can participate in this study. They will undergo the egg harvesting stages of In Vitro Fertilization (IVF), a well-established treatment for many forms of infertility.

The nuclear genome of an unaffected donor's oocyte will be removed. Then the nuclear DNA from the oocyte with a mtDNA mutation will be transferred into the enucleated oocyte of the donor.

This study will result in embryos that are cryopreserved and will not result in pregnancy. Embryo transfer into the uterus (womb) may be part of a future study that will require approval by the Food and Drug Administration (FDA).