

Mom's, not dad's, mitochondria create healthy embryos

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Mammal embryos shed paternal mitochondria within days of fertilization, perhaps to ensure the offspring a healthy life, a new study shows. Researchers from the California Institute of Technology will present their findings today at the American Physiological Society's Physiological Bioenergetics: Mitochondria from Bench to Bedside conference in San Diego.

Both parents supply mitochondria—the "energy center" of cells—to form an embryo, but previous research has shown that the father's contributions are short lived. "Maternal inheritance is a signature feature of mitochondria," wrote the research team, meaning the embryo's energy source comes solely from the mother's mitochondria and its associated DNA (mtDNA). In a mouse study, the researchers found both that mitochondria in sperm did not fuse with maternal mitochondria in the egg and that this failure to fuse occurred almost immediately. Within 80 hours of fertilization, the paternal mitochondria were eliminated from the embryo through a process of self-digestion (mitophagy).

The quick exit of [paternal mitochondria](#) may be to keep the embryo healthy if the mitochondria are defective. In addition, refraining to fuse with the other mitochondria in an embryo ensures that only one set of mtDNA—the mother's—remains. Having two groups of mtDNA "can lead to behavioral abnormalities in the offspring," wrote David Chan, MD, PhD, first author of the study.

Provided by American Physiological Society

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