

Live-action films of worm sperm help researchers track critical fertility enzymes

November 1 2011



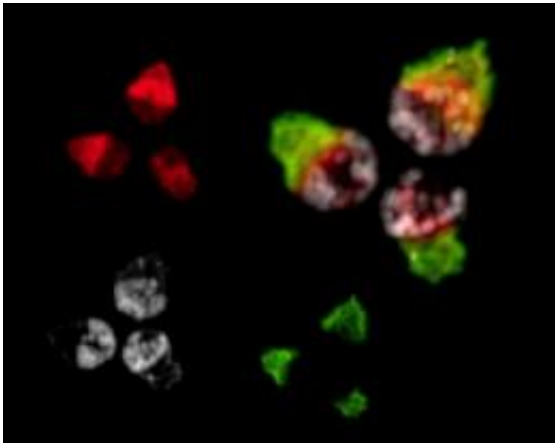
This is a micrograph of a *C. elegans* ameoboid sperm. Credit: Aiza Go and Diana Chu

Compared to most other cells in an organism, sperm undergo a radical transformation to become compact and mobile delivery systems for paternal DNA. Even though sperm looks and moves quite differently across species, SF State researcher Diana Chu and colleagues now say that there are at least a few key enzymes that are critical for sperm development and mobility in species as different as mice and nematode worms.

The study by Chu, et al., was published today online by the journal

Genetics.

These enzymes (called PP1 phosphatases) are multitaskers in the nematode, which Chu and the others discovered through unique live-action films of the enzymes at work. First, the enzymes help to separate [chromosomes](#) during sperm cell division. After that, they play a role in the development of the sperm's pseudopods—the appendages that nematode sperm use to move. Pseudopods propel the sperm with a "treadmilling" motion, and the enzymes help disassemble the cell's inner skeleton in a way that pushes the treadmilling forward.



Fluorescent images of *C. elegans* sperm. Shown in red are GSP-3/4, phosphatases required for fertility, white are membranous organelles and green is major sperm protein, a *C. elegans* protein important for motility. GSP-3/4 is shown to be an important regulator of MSP in the Wu et al. paper. Credit: Jui-ching Wu and Diana Chu

Sperm in mammals like mice—and men—don't have pseudopods and don't move in the same way, but they still rely on the phosphatases for development and mobility. Further study of the phosphatases could someday shed light on some of the causes of human infertility, since the

enzymes seem to be critical for sperm function.

More information: "PP1 phosphatases regulate multiple stages of sperm development and motility in *Caenorhabditis elegans*," published in advance online by *Genetics*. www.genetics.org/content/early/recent

Provided by San Francisco State University

Citation: Live-action films of worm sperm help researchers track critical fertility enzymes (2011, November 1) retrieved 23 April 2024 from <https://medicalxpress.com/news/2011-11-live-action-worm-sperm-track-critical.html>

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