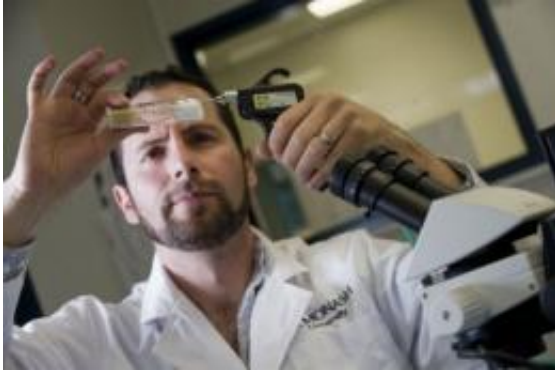


Research breakthrough on male infertility

May 13 2011



ARC Australian Research Fellow Monash Fellow, Dr Damian Dowling

(Medical Xpress) -- Around one in 20 men is infertile, but despite the best efforts of scientists, in many cases the underlying causes of infertility have remained a mystery. New findings by a team of Australian and Swedish researchers, however, will go a long way towards explaining this mystery.

According to their research published in *Science* today, a small set of [genes](#) located within the power-plants of our [cells](#) – the mitochondria – are crucial to unravelling the secrets of male [infertility](#).

Most of our genes are subjected to a rigorous quality-control process that prevents harmful [mutations](#) from freely accumulating within the gene pools of most species. If nasty mutations appear, then the individuals that harbor these mutations tend to do very poorly when it comes to

reproducing and surviving, and hence these mutations are kept at low levels within the general population.

But while this vital screening process works well for most of our genes, it is prone to breaking down in the set of genes housed inside of the mitochondria.

Lead researcher, Dr Damian Dowling explains that mitochondrial genes are unusual because they are passed only from mother to child.

"This seemingly trivial fact actually has an enormous consequence for males. It means that mutations in the mitochondria can slip through the quality-control checks unnoticed and therefore build up to high levels, if these mutations are harmful in their effects on males but not on females. This is because all of the screening of mitochondrial mutations is done in females as a result of their maternal inheritance," Dr Dowling said.

Dr Dowling and research colleagues Paolo Innocenti and Ted Morrow of Uppsala University, Sweden, have presented compelling evidence for this process in action in the common fruit fly.

Their studies show that the particular set of mitochondrial genes an individual harbours has major effects on the expression of about 10 per cent of all the other genes inside of males, but virtually no effect on females.

Crucially, the genes that are most affected in males are expressed almost exclusively in the male reproductive organs and associated with male fertility.

"What our results suggest is that the mitochondria have inadvertently evolved to be bad for males, but good for females, as a by-product of their maternal transmission. This might well put the sexes in conflict

when it comes to the question of which [mitochondrial genes](#) should be passed on to future generations," Dr Dowling said.

"While medical practitioners have a fairly good idea that certain mitochondrial mutations can bring about male infertility, the evolutionary process that we uncover actually suggests that the mitochondria might well harbor very many unidentified mutations, all of which could contribute to the problem of male infertility.

"At the very least, our results should therefore provide a road-map of where we should be looking for these mutations."

Provided by Monash University

Citation: Research breakthrough on male infertility (2011, May 13) retrieved 24 April 2024 from <https://medicalxpress.com/news/2011-05-breakthrough-male-infertility.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--