Swotting up on sex differences

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A University of Queensland researcher is investigating the genetic triggers of key differences between males and females including longevity and particular disease rates.

Dr Steve Chenoweth, a Senior Lecturer with UQ's School of Integrative Biology, is using a native species of fruit fly, Drosophila serrata, to understand how genomes are able to produce two very different forms – males and females.

"Differences between males and females make up a substantial component of diversity in the biological world, with the sexes often differing in size, shape and colour. The catch from a genetic standpoint is that males and females share almost all of their genes. Because of this, many genes that benefit one sex may actually be harmful to the other," Dr Chenoweth said.

"In birds, a gene that causes brightly coloured plumage in males may have advantages in terms of attracting a mate whereas its effect in a female could be a distinct disadvantage, making her more noticeable to predators for example. These so-called sexually antagonistic genes are a real problem, and how species have come to deal with their detrimental effects while maintaining their benefits remains a mystery for modern genetics."

He said while the genes for sex differences may be shared, the trigger for their development or suppression might be located on sex chromosomes.

"Once we understand where these sex-specific triggers are and how they work, there is potential for developing intervention methods to control sex differences in the development of certain diseases such as heart disease – much higher rate among men – as well as areas such as longevity – women on average live a lot longer than men," he said.

Together with several of his postgraduate students, he will collect thousands of flies for the next phase of his study from the floor of North Queensland's tropical rainforests this summer.

The flies are so small – just 2mm long – they must be netted then sucked up through a plastic straw by researchers before being transferred to glass bottles for transportation back to Dr Chenoweth's laboratory.

Dr Chenoweth, from Holland Park West, returned to a research career after a two-year stint as an investment banker in the United Kingdom and investigated laboratories throughout the world including at Harvard before deciding on a postdoctoral position at UQ in 2002.

Surprisingly, he said biological research and the heady world of banking had much in common.

"Although these fields are worlds apart, many of the quantitative and computational skills required are really very similar," he said.

Source: University of Queensland