

By: ~~Stefan 2007~~ Stefan 2007, Science Editor

## How to Create a Man from a Genetic Woman

### *By means of one gene*

Some men cut off their penises and balls to 'become' women. Some women shoot tones of testosterone into their veins to 'become' men. But a University of Adelaide team has found a method of getting a male mouse lacking the Y "masculinizing" chromosome by manipulating a single gene in the developing fetus. Normally, males' sex chromosome pair is made of one X and one Y chromosome while the females have two X chromosomes. Postdoctoral Research Officer Dr Edwina Sutton has managed to produce male mice with two X chromosomes by artificially turning on a gene in the developing gonads. "The gene - Sox3 on the X chromosome - is well known for its impact on brain development, but this is the first time it's ever been shown to change sexual development. By making this brain gene active in the developing gonads of mice with two X chromosomes during the critical stage of development, we switched off female development and switched on 'maleness'," said Dr Sutton. "This is not only important for our knowledge of evolution of the sex chromosomes, but it also has potentially significant implications for people with disorders of sexual development, the causes of which we know very little about. We can use these mice to increase our understanding of these disorders which occur with a high frequency in our community and, ultimately, develop therapies or technologies to improve clinical outcomes." Sutton and her supervisor Research Fellow Dr Paul Thomas, both in the University's School of Molecular and Biomedical Science, were studying the role played by Sox3 in brain development and found they had achieved 80% XX male offspring. Even if these individuals were completely male in appearance, reproductive structures and behavior, they were all sterile. In 2006, an Italian team showed that in females the gene RSPO1 inhibits the SOX9 gene that leads to male development, thus in the end, gender development is in the genes, not in the chromosomes. Mutated RSPO1, unable to inhibit SOX9 led to the development of males from individuals that were genetically females.