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New technique will help scientists study abnormal testicles

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By Dr Vivienne Raper

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Scientists have successfully grafted human testicular tissue into mice, allowing them to study for the first time how boys' testicles develop in the womb.

The new mouse model will help researchers understand the processes behind abnormal testicle development in early life, including the effects of environmental chemicals to which human fetuses are exposed in the womb. Malfunctions in developing testicles can raise young men's risk of reproductive disorders and testicular cancer in later life.

'There is now overwhelming evidence that growth and development in fetal life play a fundamental role in determining the future risk of a wide range of common diseases in later life', said Professor Richard Sharpe, principal investigator at the Medical Research Council's Human Reproductive Sciences Unit at Edinburgh University, in a press release.

'Male reproductive disorders fall into this category, in particular testicular germ cell cancer, the commonest cancer of young men in their 20s and 30s. We know it originates because of abnormal fetal germ cell development and this then leads to tumour formation in young adulthood, but how and why things go wrong with development of some of the germ cells in fetal life is unknown - and inaccessible for direct study for obvious reasons'.

Studying abnormal testicle development in boys in the womb is not currently possible so previous studies have mainly been on mice. But mice don't develop the same types of testicular cancer as humans, probably because their testicles develop differently from human ones. Human testicle development can't be modelled 'in vitro' - outside a living creature - either because it takes too long.

The new model overcomes these problems by 'xenografting' immature human testicle tissue into a type of mouse that doesn't reject tissue transplants.

'We found that the testicular graft grows and develops normally over a six-week period; in particular, the fetal germ cells develop normally', said Professor Sharpe. 'This means that we have developed a viable system in which we can now test what factors might interfere with this normal germ cell development and push it down the cancer path'.

The scientists hope to alter their mouse model to study and find treatments for intersexuality and other disorders of sexual development (DSDs) in humans. 'DSDs can result from genetic abnormalities involving the sex chromosomes or genes involved in the development of the testes', said Professor Sharpe. 'In the future, it should be possible to modify our mouse model so that we can introduce genes that either promote or disrupt normal testicular development and so provide a living model of these conditions'.

SOURCES & REFERENCES

Scientists develop the first model for investigating the origins of testicular cancer in humans
Physorg.com | *03 August 2010*

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