

NOVEL ENDOMETRIOSIS ALLOGRAFT MOUSE MODEL

Dr Stephen Charnock-Jones and his team have generated the first easy to use model of endometriosis-like lesions in immuno-competent animals that provides a model for human endometriosis.

Potential Uses

- Screening for and identification of therapeutic compounds
- Investigation of the pathogenesis
- Target identification and validation

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Case Ref: Cha-1883-07



Background

Endometriosis is one of the most common causes of pelvic pain and infertility in women, which afflicts between 5 to 20% of women of reproductive age. The pathological diagnosis of endometriosis is characterised by the presence of benign endometrial glands and stroma outside of the uterus. Current non-surgical treatments must rely on manipulation of the steroid environment, they are complicated and rarely completely effective.

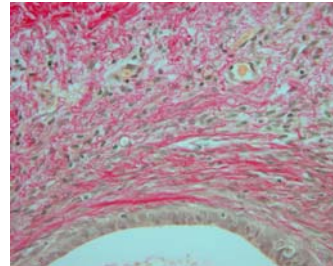
Ethical considerations limit endometriosis research in women and experimental non-human primates hence the interest of a small laboratory animal model. There are three murine models of endometriosis that are currently used: an autograft model, an allograft model and a xenograft model in immuno-deficient mouse nude or SCID but each model has significant limitations. Limitations include donor tissues that do not resemble tissue in the human condition; different histology as the lesions do not replicate the inflammatory and immune response of humans; difficulties in collecting human tissue and immune compromised mouse.

Technology

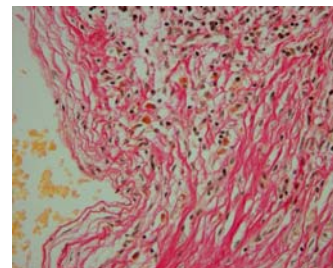
Dr Steve Charnock-Jones and his team have generated a novel endometriosis allograft mouse model by genetic modification and specific steroid manipulation of immuno-competent animals. Following implantation of the endometrial tissue, the recipient mouse rapidly develops characteristic endometrial lesions with stromal and glandular epithelial cells as well as blood vessels and fibrous collagen structures.

The recipient mouse represents an intact model of endometriosis and permits for the first time, the ready use of transgenic and knock-out tools to investigate the cellular and molecular mechanisms underlying endometriosis.

Model shows similar organised glandular structures with blood supply and collagen deposition compared with human endometriosis



Human Endometriosis



Induced Mouse Endometriosis

Collagen and fibrous structure with lesions identified using Van Gieson's staining: collagen (red), nuclei (grey/brown) and blood cells (orange/yellow).

Further development will include the testing of drugs known to relieve some of the symptoms of endometriosis.

This model will be very useful in the development of therapeutics as it allows screening and identification of useful compounds and identifying target genes or other factors associated with endometriosis.

Commercialisation

We are seeking commercial partners for licensing, collaboration and development of this technology.

This technology is protected by the UK patent application number GB0715635.9.