

# Man-made prostate created by women

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In a giant step towards understanding prostate disease, Melbourne scientists have grown a human prostate from embryonic stem cells. A study published in the March edition of *Nature Methods* describes how human embryonic stem cells were developed into human prostate tissue equivalent to that found in a young man, in just 12 weeks.

Co-first authors of the study, Monash Institute of Medical Research (MIMR) scientists PhD student Prue Cowin and Dr Renea Taylor (also from the Monash Immunology and Stem Cell Laboratories), said the discovery will allow scientists to monitor the progression of the prostate from a normal to a diseased state for the first time.

"We need to study healthy prostate tissue from 15-25 year old men to track this process. Understandably, there is a lack of access to samples from men in this age group, so to have found a way we can have an ongoing supply of prostate tissue is a significant milestone," said Dr Taylor.

"As nearly every man will experience a problem with their prostate, we're very excited about the impact our research will have," she said. While prostate cancer is the most common cancer in men, the impact of benign prostate disease (BPH) is equally significant - up to 90 percent of men will have BPH by the time they reach 80 years of age. BPH is not usually life-threatening, but has a dramatic impact on quality of life.

Prue Cowin said the discovery will allow scientists to observe first-hand the factors that play a role in the development of prostate disease.

"The tissue we've grown behaves as a normal human prostate, so it's the perfect model for testing the different hormones and environmental factors we believe play a role in the onset of prostate disease," said Prue.

"We grew the prostate tissue by 'telling' the embryonic stem cells how to become a human prostate gland. We then implanted the cells into mice, where they developed into a human prostate, secreting hormones and PSA; the substance in the blood used to diagnose prostate disease," she said.

Professor Gail Risbridger, Director of MIMR's Centre for Urological Research and leader of the research project, said the discovery will have a significant impact on prostate cancer and BPH research.

"If we can understand how to make normal prostate, we can work out how BPH develops as part of the normal ageing process," she said. "We will also have the opportunity to study the transition of healthy prostate tissue to cancer. Not only will this enable us to develop new, more effective ways of treating diseases that affect nearly every man, but we hope, eventually, to find a way to prevent these diseases in the first place," said Professor Risbridger.

Director of the Monash Immunology and Stem Cell Laboratories at Monash University, Professor Alan Trounson said stem cells and cancer were an important new area of medical research and the production of prostate tissue from embryonic stem cells provides a new tool for examining the origins of cancer and role of primitive stem cells.

Research collaborators are the Monash Institute of Medical Research, Monash Immunology and Stem Cell Laboratories, Department of Anatomy, University of California, San Francisco, USA, Australian Stem Cell Centre and TissuPath Laboratories, Melbourne.

Source: Research Australia

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