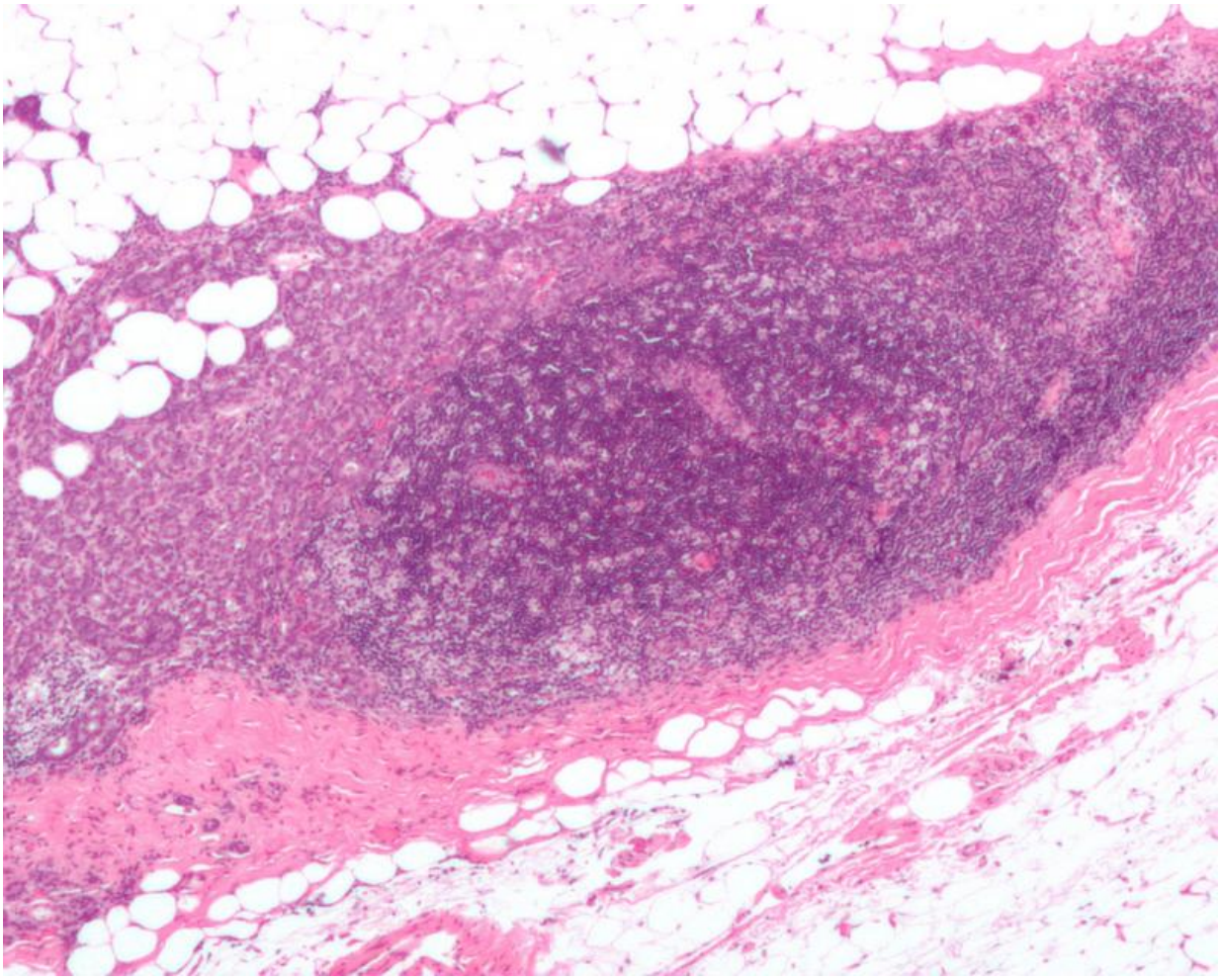
Treating breast cancer with progesterone could aid survival

July 8 2015



Micrograph showing a lymph node invaded by ductal breast carcinoma, with extension of the tumour beyond the lymph node. Credit: Nephron/Wikipedia

A special technique where breast cancer cells are "rescued" for research has been developed at the University of Adelaide. Coupled with advanced scientific technologies pioneered by Cambridge University this has provided a unique insight into the hormone regulation of breast cancers, which is expected to lead to new treatments for the disease.

Published today in the journal, *Nature*, an international breast cancer research team discovered how receptors that mediate activity of the female sex hormones (estrogen and progesterone) interact with DNA to control the growth of a large majority of breast cancers.

Researchers at the University of Adelaide's Dame Roma Mitchell Cancer Research Laboratories, led by Professor Wayne Tilley, developed the new technique.

"One in eight Australian women will be diagnosed with breast cancer in their lifetime and seven women die from the disease each day in Australia," says Professor Tilley.

"Traditionally, breast cancer tumours are destroyed once they have been removed from a patient. The new technique we have developed sees tumour cells from participating patients 'rescued' for research purposes.

"This technique, which is used to test current and new forms of therapy on tumour cells, has potential to one day provide an individualised treatment option for the patient based on how the tumour responds to therapy.

"The method is also a vital research tool. It has helped shed light on the mystery of progesterone action that has confounded researchers and clinicians for a long time," he says

Dr Jason Carroll, from the University of Cambridge's Cancer Research

UK Cambridge Institute, says they have discovered why patients with a particular type of hormone-driven breast cancer tend to have a better chance of recovery.

"We used state-of-the-art DNA reading technology to create maps showing where the oestrogen receptor attaches to DNA to switch on genes," says Dr Carroll. "We then compared these maps in breast cancer cells grown with and without progesterone. This revealed how the 'switched on' progesterone receptor redirects the oestrogen receptor to different DNA regions - switching on a different set of genes that slow down cell growth.

"This important research helps explain why some breast cancer patients have a better prognosis. Crucially, it has provided a strong case for a clinical trial to investigate the potential benefit of adding progesterone to drugs that target the oestrogen receptor, which could improve treatment for the majority of hormone-driven breast cancers," he says.

More information: *Nature*, DOI: 10.1038/nature14583

Provided by University of Adelaide