Experts band together to eradicate prostate cancer

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Prostate cancer is surprising difficult to keep alive outside the human body. Yet, like a greenhouse full of rare plants, the Melbourne Urological Research Alliance (MURAL) has cultivated a new collection of living patient tumors. By carefully studying the way these tumors grow, the MURAL consortium has identified promising drug targets for aggressive prostate cancer. Credit: Monash University

A team of scientists and clinicians have developed a faster and more accurate way to test new treatments for the most aggressive form of prostate cancer.

Prostate cancer kills more than 3,300 Australian men every year. Although surgery or radiotherapy are curative for many men with early stages of prostate cancer, more severe cases of the disease require further treatments. Given that tumours rapidly evolve to evade these therapies, it is clear that new therapeutic targets are urgently required for men with advanced prostate cancer.

Researchers across the world are working on novel therapies and treatments for prostate cancer, but it often takes years for these cancer research breakthroughs to benefit patients, as they move through the stages of testing for effectiveness and safety. Generally, new cancer treatments undergo pre-clinical testing on oversimplified cancer cells artificially grown in a lab, rather than on live tumours. Yet while live tumours are the perfect tissues for testing new cancer therapies, they are incredibly difficult to keep alive once they have been removed from the patient's body.

That is, until now.

A multidisciplinary consortium, led by Monash University's Professor Gail Risbridger, has developed a new way to grow tumours in the lab, derived from donor patient tumours. These new lab-grown tumours are as complex as the tumours they are derived from, yet are able to be kept alive in the lab, enabling researchers to test the efficacy of a variety of drug combinations more quickly and efficiently than ever before.

Professor Risbridger, from theMonash Biomedicine Discovery Institute (BDI) and the Peter MacCallum Cancer Centre, is a world-leading prostate cancer researcher. Her team now has more than 20 of these lab-

grown tumours available for accurate testing of new drugs.

"These pre-clinical tests can rapidly determine which drugs should be trialled in patients," Professor Risbridger said.

In a paper published in the journal *European Urology*, Professor Risbridger and Dr. Mitchell Lawrence, also from the Monash BDI, describe using the lab-grown tumour model to test new drugs that effectively stop the growth of prostate cancer cells. Previous research on these drugs at Peter Mac has progressed to clinical trials for blood cancers. This new study shows the drugs also work in prostate cancer.

Professor Risbridger said that the way the drugs suppressed the growth of prostate cancer in the lab-grown tumours makes them ideal candidates for testing in humans.

"The lab-grown tumours will accelerate cancer research so that scientific discoveries benefit patients sooner," Professor Risbridger said.

"These lab-grown tumours have enabled us to rapidly compare different treatments and identify those that cause the most striking reduction in tumour growth," Dr. Lawrence said.

"We developed a novel combination of two drugs that suppresses the growth of aggressive prostate cancer cells that do not respond to other treatments," he said.

To share these unique lab-grown tumours with researchers around the world, Professor Risbridger established the collaborative platform Melbourne Urology Research Alliance (MURAL), which is a consortium of scientists, urologists, oncologists, pathologists, computer scientists and patient representatives. Housing the largest collection of lab-grown prostate cancer tumours, MURAL provides scientists globally with the

best tools to test new drugs to fight prostate cancer.

More information: Mitchell G. Lawrence et al, Patient-derived Models of Abiraterone- and Enzalutamide-resistant Prostate Cancer Reveal Sensitivity to Ribosome-directed Therapy, *European Urology* (2018). DOI: 10.1016/j.eururo.2018.06.020

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