New possibilities for prostate cancer treatment revealed

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Researchers have identified a sub-group of cells that could contribute to prostate cancer recurrence, opening up new ways to treat the disease, which claims more than 3000 lives a year in Australia.

Published today in *Science Translational Medicine*, a study led by Monash University researchers has found prostate cancer cells that survive androgen withdrawal treatment. Previously unidentified, these cells are potential targets for future treatments. As they are present early in disease development, there is the possibility of therapy before the cancer reaches the aggressive, incurable stage.

Prostate cancer is the most common form of cancer in men, with around 20,000 new cases diagnosed each year in Australia.

For advanced cases, the best available treatment involves drugs that effectively mimic castration and so deprive the tumour of the male hormones that cause it to grow. Androgen deprivation therapy is highly effective; however, the tumour eventually becomes resistant to the treatment and regrows in an incurable form.

Led by Professor Gail Risbridger and Dr Renea Taylor of Monash University, researchers obtained tumour samples from 12 men with early stage, localised prostate cancer. Then, using mouse models to mimic the progression in humans, they closely observed how the cancer cells responded to and survived androgen deprivation therapy. Even after several weeks of androgen deprivation, residual tumour cells continued

to persist.

"The results indicate that these persistent cancer cells somehow differ from cancer cells that respond to androgen withdrawal, and are likely to be the precursor cells that lead to advanced androgen-resistant disease. We will now investigate how to effectively target these cells," Professor Risbridger said.

Professor Mark Frydenberg of the Monash Department of Surgery, and Chairman of the Department of Urology, Monash Health, said ultimately the findings could lead to additional therapies to increase the effectiveness of existing prostate cancer treatments.

"This new information suggests that potentially some of the powerful targeted therapies now being used for advanced prostate cancer may have a role to play in earlier localised cancers, especially those with high-risk features, and this hypothesis can be actively tested," Professor Frydenberg said.

"It also allows for testing of novel new compounds to determine if these agents have effectiveness against these hormone resistant cells."

More information: "A Preclinical Xenograft Model Identifies Castration-Tolerant Cancer-Repopulating Cells in Localized Prostate Tumors," by R. Toivanen, *Science Translational Medicine*, 2013.

Provided by Monash University