Why combined therapies increase survival in prostate cancer

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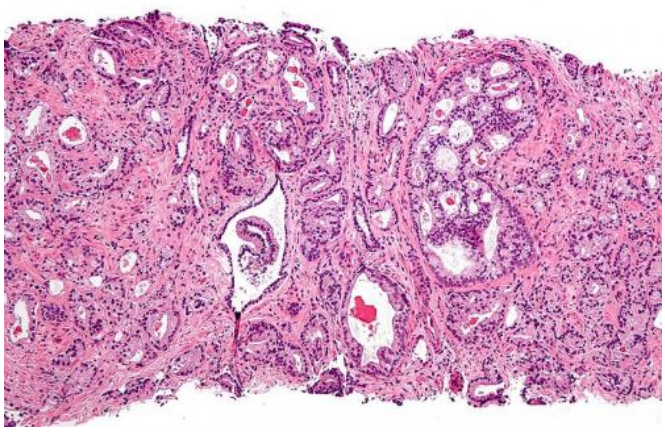

Micrograph showing prostatic acinar adenocarcinoma (the most common form of prostate cancer) Credit: Wikipedia

Researchers at Karolinska Institutet, SciLifeLab and Centre for Clinical Research, Västerås have been able to explain why a combination of castration therapy and radiation therapy increases survival rates for patients with prostate cancer, compared to if they only receive radiation therapy. The findings, which are presented in the journal *Science Translational Medicine*, show that castration therapy impairs the DNA-repair machinery of the cancer cells, making them more sensitive to radiation.

It is well known that a combination of hormonal castration therapy and radiation therapy significantly increases survival rates for patients with prostate cancer compared to radiation therapy alone. The reasons have however been unknown up until now.

The new study led by Thomas Helleday at Karolinska Institutet/SciLifeLab, reveals that castration therapy decreases the amounts of proteins essential for DNA-repair in cancer cells. This impairs the cell's DNA-repair machinery, making them more sensitive to radiation therapy.

More than 250 000 deaths each year

Prostate cancer is the second most frequently diagnosed cancer and accounts for 15 percent of all cancers in men world-wide. It is the sixth leading cause of cancer death in males worldwide and causes more than 250 000 deaths every year. The understanding of the mechanisms behind increased survival for prostate cancer-patients that receives combined therapies will hopefully lead to better and more optimized treatments.

The current study study is also a part of an upcoming doctoral thesis, which will be defended by Dr Firas L. Tarish at the Department of Medical Biochemistry and Biophysics, Karolinska Institutet on 13 November 2015.

More information: F. L. Tarish et al. Castration radiosensitizes prostate cancer tissue by impairing DNA double-strand break repair, *Science Translational Medicine* (2015). DOI: 10.1126/scitranslmed.aac5671

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