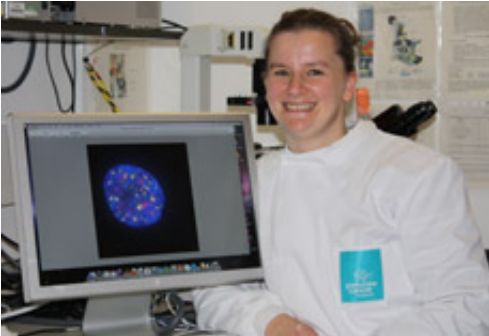


# Combination therapy could lead to reduction in prostate cancer recurrence

14 November 2013



Dr Fiona Frame with a snapshot of prostate cancer cells

Prostate cancer patients who receive radiotherapy could soon be treated more effectively, according to research published today in the *British Journal of Cancer*.

Although radiotherapy is an effective treatment for the disease, about a third of patients go on to experience a recurrence of their cancer.

Scientists funded by Yorkshire Cancer Research at the University of York have identified a population of radiation resistant [prostate cancer](#) cells, and by combining low doses of a common cancer drug with radiotherapy treatment they have increased the sensitivity of these cells to radiation. The findings could lead to a reduction in recurrences.

Professor Norman Maitland, Director of the YCR Cancer Research Unit in the Department of Biology at York, said: "There is a population of cells in every cancer that is highly resistant to radiotherapy. By identifying these cells, we have pin-pointed what we need to target."

Dr Fiona Frame, a member of Professor Maitland's team, began her study by taking tissue from prostate cancer patients undergoing surgery. She then divided the [cancerous cells](#) into three

categories and tested them for their response to radiation. Results from the tests showed that rare stem cells, which act as a 'silent root' within the cancer, showed more resistance when compared to other cell types.

Dr Frame also found that the DNA inside these cells is more tightly wound than the rest of the [tumour cells](#). This tightly wound DNA is known as heterochromatin and acts as a protective shield against radiation.

Following these tests, Dr Frame used a HDAC inhibitor – a drug which interferes with the development of heterochromatin and leads to a less tightly packed form of DNA – to treat these cells. This led to increased radiation-induced DNA damage and reduced stem cell survival.

Dr Frame said: "Looking to the future, novel cancer treatment strategies must become more targeted and will require specific combination therapies tailored to different cell types within individual tumour types."

Professor Maitland and his team at the YCR Cancer Research Unit achieved international recognition in 2005 when they were the first to identify prostate [cancer stem cells](#), which are believed to be the 'root cause' of prostate [cancer](#). The team, now supported by a £2.15m award from Yorkshire Cancer Research, has since explored the exact molecular properties that allow these cells to spread, survive and resist aggressive treatments such as radiation and chemotherapy.

**More information:** "HDAC inhibitor confers radiosensitivity to prostate stem-like cells" (BJC.2013.691 / 4322-13TH): [www.nature.com/bjc/journal/vao.../ncurrent/index.html](http://www.nature.com/bjc/journal/vao.../ncurrent/index.html)

Provided by University of York

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