Example project descriptions

Damaging DNA: Targeting prostate cancer's Achille's heel
Dr Claire Fletcher

Despite increasing numbers of drugs available to treat advanced prostate cancer, resistance usually develops, leaving patients with no effective treatments. Currently-available drugs also have debilitating side-effects. Therefore, new drugs that work in different ways are urgently required. Many advanced prostate cancers have defects in their ability to repair DNA damage - an 'Achilles heel' that can be exploited using new drugs that increase such damage.

We found a tiny piece of DNA-like material called a microRNA that causes very high levels of DNA damage in prostate cancer, but not normal prostate cells. This project will develop this microRNA as a potential new advanced prostate cancer treatment

We designed two different forms of the microRNA for maximum stability in the body and delivery specifically to prostate cancer cells. We will test their ability to cause DNA damage, inhibit cancer growth and increase sensitivity to other DNA-damaging drugs using laboratory-grown cells and also tumour tissue donated by patients. Next, we will examine the ability of microRNA to inhibit prostate cancer tumour growth in mice; this will also tell us about how microRNA is processed by the body, and whether any side-effects are observed. These experiments are essential for subsequent microRNA clinical trials in patients.

This project has now been funded by PCR, if you would like to find out more, please visit: https://www.prostate-cancer-research.org.uk/project/prostate-cancers-achilles-heel/

Blocking prostate cancer signals
Dr Toby Phesse and Dr Helen Pearson

Prostate cancer (PC) is the second commonest cause of cancer deaths in men. This is partly because the treatments we have do not work well against advanced-PC (when the cancer has spread around the body), and new treatments are urgently needed.

There is a set of signals (called the Wnt pathway) that tells PC to grow and move around. This Wnt pathway is often over-active in advanced-PC.

We have compelling early results which show that blocking the Wnt pathway may work well in treating advanced-PC. Our project aims to learn more about this.

There is a drug that blocks the Wnt pathway which is already being tested in patients with other cancers. We will investigate whether this drug can treat advanced-PC. Bone is the commonest place for PC to spread to. If we can understand what factors are controlling how PC spreads to the bone, we can potentially target them for therapy. Therefore, we will also look at how Wnt signals control the growth of PC in the bone and if the Wnt blocking drug can reduce this.

This work will provide vital information to help develop new treatments for this currently incurable aspect of PC.

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