Using the body’s immune system to fight prostate cancer

Influence of stage and therapy on the NKG2D axis in prostate cancer

This project is funded in collaboration with the Medical Research Council (MRC) and will provide funding for a medical doctor to complete a PhD over three years, by studying how the body’s immune system can be used to fight prostate cancer. This research will focus on a receptor called NKG2D which is able to detect cancerous cells. The researchers will investigate how it works and whether boosting levels of it could provide a new therapy.

Using the body’s own immune system to treat cancer is an interesting option. Researchers have found that a receptor on immune cells, called NKG2D, binds specifically to cancer cells. When NKG2D binds to a cancer cell, it tells the immune system to kill that cell, while ignoring healthy cells. Previous work in the lab has shown that prostate cancer patients receiving hormone therapy or chemotherapy have lower levels of the NKG2D receptor on their immune cells. However, treatment with zoledronate, a drug already commonly used to treat cancer spread to bones, leads to an increase in levels of NKG2D. These results suggest that boosting the levels of this receptor might help the body to fight cancer.

The scientists will investigate the NKG2D receptor in patients with prostate cancer. They want to find out whether this receptor, and the way it works, is different in patients with low grade (less aggressive) and high grade (more aggressive) prostate cancer. They will also look at the effect of various prostate cancer treatments (chemotherapy and hormone treatment) on this receptor. Finally they will investigate whether they can improve the response of the immune system when a cancer cell is detected by the NKG2D receptor.

The researchers will use prostate cancer tissue samples stored in the Prostate Cancer Tissue Bank at King’s College London. They will also use blood samples from patients with prostate cancer undergoing treatment with hormone or chemotherapy. Finally they will use cancer cells in the laboratory to carry out some of the experiments.

Ultimately their results will increase our understanding of prostate cancer and the immune system and could lead to a new form of prostate cancer immune therapy. New treatments with fewer side effects are needed for thousands of men diagnosed with prostate cancer every year. Therefore this research project will be an important contribution.