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**Grant Type**
Pilot Award

**Grant Round**
Pilot Award 2013

**Reference Number**
PA13-005

**Lead Applicant**
Dr Christine Galustian

**Research Title**
Mutation of Duffy Antigen Receptor for Chemokines (DARC) as an indicator of prostate cancer severity in Afro-Caribbean men

**Total Research Cost**
£49,787.00

**Lay title of project**
Does the absence of a protein, known as DARC, increase prostate cancer severity in Afro-Caribbean men?

**What are you proposing?**
We want to investigate whether the absence of the protein, DARC, from the red blood cells of most Afro-Caribbean men, is associated with a more aggressive form of prostate cancer than that found in Caucasian or Asian men who do have this protein.

**Why are you proposing it?**
It is not known why Afro-Caribbean men are three times more likely to develop prostate cancer than white men of the same age or why this cancer can be more aggressive. Studies have shown that socioeconomic, lifestyle and cultural differences cannot account for this difference. We believe that a protein called DARC (Duffy Antigen Receptor for Chemokines) that is present on red blood cells and blood vessel cells of most Caucasian and Asian people, may protect against development of more aggressive prostate cancer. The majority of Afro-Caribbean people (over 60%) do not have DARC on their red blood cells. This is an evolutionary genetic change in these populations that originated in regions where malaria is endemic, for protection against the disease; certain malarial parasites use DARC to enter red blood cells and so its absence can protect against developing malaria. However, DARC also functions to remove certain growth factors (known as chemokines) which increase growth and spread of cancers including prostate cancer. We therefore hypothesise that Afro-Caribbean men with prostate cancer, most of whom do not have DARC on their red blood cells, will have higher levels of cancer promoting chemokines in their blood. As a consequence, their prostate cancer is likely to be more severe.

**How are you proposing to do it?**
We will take blood and prostate cancer tissue samples from age and socioeconomically matched Afro-Caribbean and white men diagnosed with prostate cancer and look for levels of several genetic and protein
markers associated with DARC, or lack of it. We will also measure levels of a number of cancer promoting chemokines in the patients’ blood. We will then be able to find out if these markers and chemokines are linked to the severity of a patient’s prostate cancer.

**How long will it take?**

It will take one year to complete the genetic and protein marker analysis of the patients and link this information with prostate cancer severity.

**What are the expected outcomes?**

We expect to show that the absence of DARC protein on red blood cells, and abnormal forms of this protein which do not bind to growth factors as strongly, are associated with more aggressive prostate cancer.

**How could it make a difference to the lives of men affected by prostate cancer?**

If our results show that absence or mutation of DARC in Afro-Caribbean men is associated with aggressive prostate cancer, we could screen all men for these markers using a simple blood test. This will help us to identify men for close monitoring and interventional treatment. In the long term, we can prevent disease in men with these altered markers either by gene therapy or by treatments to inhibit the growth factors in the blood that cause the prostate cancer cells to grow and spread.

**Please write a summary of the project in one sentence only.**

This is a study to find out if the absence or mutation of a red blood cell protein, DARC, in Afro-Caribbean men is one reason why these men are more likely to get aggressive prostate cancer.