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Wessex Medical Research

Funding research to fight disease

The newsletter of WESSEX MEDICAL TRUST

Autumn **2014**

CERVICAL CANCER—an Appeal

Wessex Medical Research is launching a special appeal on this vital topic which will run during 2014 and 2015. As the result of a competitive process, the potential proceeds of the appeal have been awarded to Dr Edd James, a Lecturer in Cancer Immunology at Southampton. His co-researcher is Dr Laura Bourne, a clinical gynaecological oncologist at both Southampton and Portsmouth Hospitals. The value of the final grant is expected to be in the range £30-50,000: clearly, the more we raise, the greater amount of relevant research that can be undertaken. Details of the background and proposed research project are given below and overleaf.

Please give generously, either by direct donation or by supporting our fundraising activities during this autumn and in 2015: these include the specially reinstated Christmas Draw which on this occasion offers exceptionally generous prizes. Details of the Draw and of the various dedicated fundraising events are on our website: *www.wesmed.org.uk*

After completing his PhD at Imperial College in 2001, Dr Edd James spent five years at the University of California at Berkeley before taking up his present position at Southampton.

The current situation

Cervical cancer is overwhelmingly caused by infection from the Human Papilloma Virus (HPV). The vast majority of all women will contract the virus during their lives but in many cases this will have no ill effect. Over 30 variants of the virus have been identified to date with at least 15 being high risk for developing cervical cancer. Vaccination currently protects against only two of these variants although these two are responsible for up to 70% of cervical cancers.

Screening generally concentrates on the late teens–early 40s age group. High risk areas relate to either age or family history.

In most instances, identified cases are treated successfully by either laser or freezing procedures, sometimes requiring a local anaesthetic. Nevertheless, these procedures can be an uncomfortable and sometimes painful experience for many patients.

More advanced (and therefore potentially more dangerous) cases of cervical cancer arise because:

- Many women do not attend for smear tests when invited;
- Even if smear tests are taken, some cancers can develop extremely fast (this is what happened to Jade Goody).

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The science

In most circumstances, viruses which invade the body exhibit outward signs on the cells they infect. These signs allow the body's immune system–killer T-lymphocytes–to identify infected cells and eliminate the virus. Typical examples are the common cold, sore throats and flu. However, in many versions of cervical cancer, these external signs are not present. This allows the virus to hide from the immune system which makes it much more difficult to kill them.

The aim of the research

- To identify ways in which the virus can be recognised by the immune system through a complex investigation relating to ERAP (a compound found within cells that breaks down proteins). It is hoped this will in turn lead to the development of a suitable vaccine which would in most cases progressively replace the more invasive and uncomfortable laser/freezing procedures;
- To identify those high risk patients who will need much more regular testing owing to the inability of their immune system to detect their particular viral infection

The principal objective will be to understand why HPV infected cells are unable to display the signals required for detection by the immune system. Once the cause is established, identification of the problem on an individual basis going forward would probably be by a simple blood test rather than a smear test thus reducing the discomfort to the patient.

Existing linked research undertaken by the current team on auto-immune diseases (which are biologically linked) has shown positive results within two years so the prospects for a positive outcome on this project in a realistic timescale are good.

Innovation Grants 2014

The Trustees have this year awarded seven Innovation Grants, each of £20,000, to the following:

Dr Massimiliano Mellone
Faculty of Medicine
"The role of the DNA Damage Response (DDR) pathway in myofibroblast differentiation."
Can controlling the relationship between cancer cells and normal cells alter the progression of the disease?

Dr Veronika Jenei
Faculty of Medicine
"Epidermal growth factor receptor – integrin crosstalk in the regulation of cancer progression."
Investigating a cellular pathway that enables cancer to invade and spread around the body

Dr Charles Birts
Faculty of Medicine
"Metabolic regulation of the breast cancer biomarker Annexin A3."
Investigating whether cell metabolism influences cancer growth. This may lead to improved cancer diagnosis and whether a patient is likely to have a severe form of the disease

Dr Diego Gomez-Nicola
Centre for Biological Sciences
"Impact of inflammation on neurogenesis during Alzheimer's disease: understanding and modulating the self-repairing mechanisms of the brain."
Identifying and modulating the mechanisms of self-repair of the brain, with the potential to replace lost neurons during Alzheimer's disease.

Dr Matthew Rose-Zerilli
Faculty of Medicine
"Establishing single cell genetic techniques for the analysis of cancer by understanding intra-clonal heterogeneity in the B-cell leukaemia, Chronic Lymphocytic Leukaemia."
Understanding why, in some patients with leukaemia, some cancer cells evade being treated which results in relapse

Dr Seung Seo Lee
Department of Chemistry
"Specific Chemical Probes for the Ubiquitin System."
Developing chemicals that modify cellular events that cancer cells are dependent on: this has the potential to lead to creating new types of drugs to treat cancer

Dr Sumeet Mahajan
Institute for Life Sciences
"Multimodal label-free imaging for studying and evaluating stem cell plasticity."
A completely new way of looking at living cells in the laboratory that aims to visualise the growing potential of stem cells, particularly towards new bone formation to treat osteoporosis and fractures

T: 023 8120 4460

E-mail:
wendy.burchall@wesmed.org.uk

Mailpoint 420
Level B South Academic Block
Southampton General Hospital
Southampton SO16 6YD