

Southampton scientists begin patient trials of new leukemia cancer vaccine

January 31 2011

A new cancer treatment which strengthens a patient's immune system and enables them to fight the disease more effectively is being trialled on patients for the first time in the UK.

The treatment will use a new DNA vaccine, developed by scientists from the University of Southampton, which will treat a selected group of volunteers who have either chronic or acute myeloid leukaemia - two forms of bone marrow and blood cancer.

Scientists believe they can control the disease by vaccinating patients against a cancer-associated gene (Wilm's [Tumour](#) gene 1), found 'expressed' in almost all chronic and acute leukaemias.

A team of researchers and health practitioners, led by Professor Christian Ottensmeier of the University of Southampton Experimental Cancer Medicine Centre and Dr Katy Rezvani of Imperial College London and Imperial College Healthcare NHS Trust, hope to recruit up to 180 patients to the trial which will take place at hospitals in Southampton, London and Exeter over the next two years.

The research is funded by the charity Leukaemia & Lymphoma Research and the Efficacy and Mechanism Evaluation (EME) programme, which is financed by the Medical Research Council (MRC) and managed by the National Institute for Health Research (NIHR).

"In chronic myeloid leukaemia, current treatment can reduce the cancer

but the drug needs to be taken indefinitely and has unpleasant side effects. Prognosis of acute myeloid leukaemia is currently poor and better treatments are urgently needed," comments Christian Ottensmeier, professor of experimental cancer medicine at the University of Southampton and consultant oncologist at Southampton University Hospitals NHS Trust.

"We have already demonstrated that this new type of DNA vaccine is safe and can successfully activate the immune systems in patients with cancer of the prostate, bowel and lung. We believe it will prove to be beneficial to patients with acute and chronic myeloid leukaemia."

Dr Katy Rezvani, clinical senior lecturer at Imperial College London and consultant haematologist at Imperial College Healthcare, says: "At Hammersmith Hospital we have been using targeted leukaemia drug therapies, like tyrosine kinase inhibitors, for over 10 years. While these drugs are the first line therapy for chronic myeloid leukaemia patients, they can rarely 'cure' the condition. This new vaccine has the potential to improve the outcome of leukaemia treatments and could serve as a method of managing solid tumours."

Professor Freda Stevenson, an immunologist at the University of Southampton who is also working on the study, adds: "I'm very pleased with the results from the laboratory research, and am optimistic the vaccine will be successful in making a real difference to patients with myeloid leukaemia."

In the study, each participant will receive six doses of DNA vaccine over a six month period, with further booster vaccinations if successful. The vaccine will be administered in a groundbreaking new way, using electroporation, in which controlled, rapid electrical pulses create permeability in cell membranes and enable increased uptake of biological material after its injection into muscle or skin tissue. The

electroporation system was developed by the US pharmaceutical company Inovio.

Inovio's CEO Dr J Joseph Kim, says: "This study expands Inovio's long-standing relationship with the University of Southampton into an important disease area. We are proud that Inovio will make a significant contribution to this Phase II trial for these cancers with clear unmet medical needs."

The DNA vaccine was developed at the University with funding from Leukaemia & Lymphoma Research and Cancer Research UK.

Dr David Grant, Scientific Director of Leukaemia & Lymphoma Research, adds: "We are delighted to see this trial in leukaemia go ahead. It is an important step for us to see the laboratory work on DNA vaccines that the charity has supported take the next logical step into clinical testing. The trial has undergone extensive international peer review and we are very excited to see the first patients being treated. We believe that this vaccine has real promise to improve outcomes in patients with leukaemia."

The success of the vaccines will be measured over a two year survival period for acute myeloid leukaemia and by assessing the immune system's response to the drug using a disease marker (BCR-ABL) for chronic myeloid leukaemia.

Study centres

Southampton University Hospitals NHS Trust - Southampton General Hospital - www.suht.nhs.uk

Imperial College Healthcare NHS Trust - Hammersmith Hospital - www.imperial.nhs.uk/hammersmith

Royal Devon and Exeter NHS Foundation Trust - Royal Devon and Exeter Hospital - www.rdehospital.nhs.uk/

About Leukaemia

Leukaemia is a malignant disease of the bone marrow and blood characterised by the uncontrolled accumulation of [blood cells](#). Leukaemia accounts for 220,000 deaths worldwide each year.

Acute myeloid leukaemia (AML) is a cancer of the myeloid line in blood cells and is characterised by rapid growth of abnormal white blood cells that accumulate in the [bone marrow](#) and interfere with the production of normal blood cells. Chronic myeloid leukaemia (CML) is a type of cancer that causes the body to produce large numbers of immature and mature white blood cells.

Provided by University of Southampton

Citation: Southampton scientists begin patient trials of new leukemia cancer vaccine (2011, January 31) retrieved 20 April 2024 from <https://medicalxpress.com/news/2011-01-southampton-scientists-patient-trials-leukemia.html>

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