MedicalXpress

World's most advanced system to help Aussie researchers detect and analyze rare cells

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A world-first research system to be launched today at the Centenary Institute will give medical researchers in Australia a new weapon in the fight against cancer and other life-threatening diseases. The new BD LSR-9 Flow Cytometer with its nine lasers will be the first user-operated flow cytometer with unprecedented ability to detect and analyse rare cells.

The BD LSR9 Flow Cytometer will be housed at the Centenary Institute as part of the Advanced Cytometry Facility (ACF), which is a joint venture run by the Centenary Institute, the University of Sydney and the Bosch Institute.

Advanced Cytometry Facility Academic Director Professor Nick King said: "Currently, a researcher may have to run a sample of cells two or three times using complex labelling systems to analyse all the unique characteristics of a cell. This makes it very difficult to detect rare cell populations. It's like a detective at a crime scene gathering two or three sets of partial fingerprints then having to cobble them together to get a complete fingerprint.

"The extra lasers on the LSR-9 Flow Cytometer will give researchers a greater range of labels to analyse cells so they will only have to run one sample. By generating the complete 'fingerprint' from one sample, researchers can make more accurate and direct measurements of cell populations. This means we can use less material, which is important when using patient samples, and we can make direct links rather than

inferring relationships from incomplete, partial samples."

Funding for the $1 million BD LSR9 Flow Cytometer and related systems has been provided by the Australian Research Council (ARC), National Health and Medical Research Council (NHMRC), the University of Sydney, University of New South Wales and the Centenary Institute.

University of Sydney Deputy Vice Chancellor (Research) Professor Jill Trewhella said: "This significant funding is a major investment in world-leading technology to support Australian researchers. Most high end flow cytometers currently have four to five lasers so the new flow cytometer with nine lasers is a major step forward that will provide local researchers with greater ability to identify the unique characteristics of rare disease-causing cells."

Centenary Institute Head of T Cell Biology Professor Barbara Fazekas de St Groth explained how the new system could significantly reduce the time and samples required for advancing key medical research projects.

Professor Fazekas de St Groth said: "The new flow cytometer will make a huge difference to our studies of the rare regulatory T cells that protect against allergic, autoimmune and cardiovascular diseases. We can now obtain more information from a single analysis of circulating white blood cells than we could previously from multiple analyses requiring over 10-times more sample material. This will speed up the pace of research into this crucial cause of chronic disease in our community."

About Flow Cytometry

A flow cytometer allows researchers to rapidly analyse large populations of cells. Individual cells are examined and a wide variety of properties of each cell can be recorded. Researchers tag the cell populations with

fluorescent dyes and then use the flow cytometer to a pass the cells through a beam of laser light one at a time. This laser light is scattered by the cells and provides a way to measure physical properties of the cell such as size. The laser also excites the different fluorescent dyes attached to cells. These dyes produce light of different colours and allow the researchers to count and analyse the cell types that are present. By examining the cells one by one, researchers can find minute characteristics of the cells to get an accurate profile of rare disease-causing cells.

Provided by Centenary Institute