



DR HILDA PICKETT

CHILDREN'S MEDICAL RESEARCH INSTITUTE
FUNDED BY CAN TOO

Unlocking cancer cells' secrets

Dr Hilda Pickett's special interest is telomeres, protective structures at the ends of chromosomes. Telomeres shorten slightly every time a cell divides, placing an upper limit on the number of times a normal cell can do so.

Cancer cells, on the other hand, can divide an unlimited number of times. To achieve this they prevent their telomeres shortening by activating a telomere maintenance mechanism.

Hilda believes that this holds intriguing possibilities which could lead to new cancer drug developments and clinical work.

Telomere maintenance can be achieved by switching on an enzyme called telomerase, the discovery of which led to American scientists winning the Nobel Prize in physiology or medicine in 2009.

Copying DNA

Cancer cells can also maintain telomeres by copying telomeric DNA from other chromosomes, a mechanism called alternative lengthening of telomeres (ALT), which was identified at the Children's Medical Research Institute (CMRI) at Westmead in Sydney, where British-born Hilda is a Senior Research Officer.

Hilda's Cure Cancer Australia grant was awarded for a project entitled Telomere trimming: a novel mechanism for preventing unlimited cellular proliferation. The study seeks to identify new ways to target telomerase by preventing the correct assembly of the telomerase enzyme and rendering it inactive. In addition she is investigating how telomerase is actually recruited to the telomere.

Preventing unlimited growth

"It's possible a telomere-trimming mechanism exists in normal human cells to prevent them from having a growth advantage, which may provoke the growth of tumours," she explains. "Understanding this in-built mechanism of rapid telomere shortening has the potential to allow us to shorten the telomeres of cancer cells, preventing their unlimited growth."

Thirty-four-year old Hilda became interested in telomeres as an undergraduate at the University of Birmingham in England. She thought it was interesting that the ends of chromosomes could be responsible for both ageing (when telomeres are too short) and cancer (when telomeres are maintained and cells can divide indefinitely).

She went on to do her PhD at the University of Leicester, working on telomere maintenance in colon cancers and the ALT mechanism – which involved collaboration with Professor Roger Reddel at the CMRI.

She sees her Cure Cancer Australia grant as vital. It's allowing her to recruit a PhD student in 2010 and has introduced her to the world of writing competitive grant proposals.

"It's a very important step for young researchers to pursue an independent research career and to achieve further, more substantial, funding in future."

Having lived in Australia for more than four years, Hilda enjoys surfing, going to the gym, dancing, cycling, trapezing and snowboarding.