

Research Summary and Annual Report (2007)

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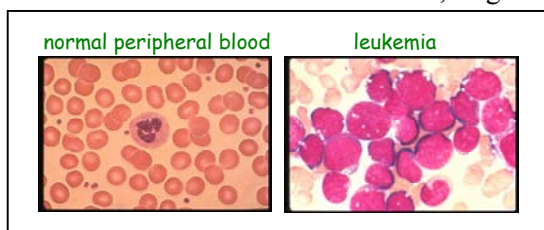


Dr. Mark Guthridge was awarded a [Peter Nelson Senior Research Fellowship](#) in 2005 for the study of leukaemia

Leukaemia still ranks in the top 10 forms of cancer and it remains one of the hardest to cure. It afflicts all age-groups and ethnic backgrounds and is the leading form of cancer in children while it is particularly difficult to treat in the elderly where aggressive chemotherapeutic approaches are not possible. The biggest obstacle to curing leukaemia has been preventing disease relapse. Initially, most patients diagnosed with leukaemia actually respond very well to conventional chemotherapeutic approaches and 70-80% go into remission. However, the majority of leukaemic patients eventually relapse and succumb to the disease. So the challenge for clinicians and medical researchers worldwide has been to not only understand why leukaemic relapse occurs, but to also develop new therapeutics that will prevent relapse and provide a long-term durable cure.

A team of researchers led by Dr. Mark Guthridge at the Institute of Medical and Veterinary Science (IMVS) here in Adelaide have discovered one of the mechanisms by which leukaemic cells may be able to survive and eventually become resistant to drug therapies leading to relapse. Using state-of-the-art techniques that allow them to look inside leukaemic cells, they have identified a “molecular switch” that controls cell survival and cell growth. This “molecular switch” in some respects resembles a light switch that in normal cells can be turned on and off to control cell survival, but in leukaemic cells is fundamentally faulty and remains permanently switched on. The consequence of this faulty switch is that leukaemic cells gain a survival advantage and have a prolonged life-span making them resistant to the cell-killing effects of chemotherapeutic drugs. It is this “molecular switch” that is thought to allow the long-term survival of leukaemic cells that leads to disease relapse.

The research team at the IMVS have begun to identify potential therapeutic targets of this deregulated “molecular switch” in leukaemia. In some cases, targeting this switch has resulted in killing leukaemic cells in the test-tube, however, the results are very preliminary and much more work will be required to validate possible targets and develop drugs for the clinic.



The work of Dr. Guthridge has been strongly supported by the Cancer Council of South Australia since he returned to Adelaide in 1998 from New York University Medical Center and he received a Peter Nelson Leukaemia Research Fellowship to continue his work in 2005. The findings of Dr. Guthridge together with Professor Angel Lopez, also at the IMVS, have been presented at major international scientific conferences and their significance for leukaemia research have been recognized with the award of a National Institutes of Health (NIH) grant from the United States Government.

One of the main reasons why the work of Dr. Guthridge and Prof. Lopez have managed to stay one step ahead of larger and better funded laboratories in the US and Europe is the unique combination of expertise, technology and pathology services available within the IMVS in Adelaide. For example, Professor Bik To and Professor Tim Hughes head the Therapeutic Product Facility (TPF) within the IMVS. Since the inception of the TPF in 1986, it has remained the largest bank of leukaemic samples in Australia. It is this bank of leukaemia samples that provides an invaluable resource that gives Dr. Guthridge the edge in his research.

As a recipient of a Peter Nelson Leukaemia Research Fellowship, Dr. Guthridge gives frequent public lectures on how leukaemia arises, the current treatments available and how medical research is finding potential new ways to treat this intractable disease. He also takes members of the public who have made financial donations aiding leukaemia research on tours of the laboratories showing how current research may impact on the way we treat cancer in the future. Details of these events and how donations can be made can be obtained from Nicole Polglase at the Cancer Council of South Australia.