

## EDITORIAL

## Eat, Sleep and Get Diabetes

One million Australians currently suffer from diabetes and this number is predicted to double in the next ten to twenty years. Type 1 diabetes is the early onset form, characterised by the insulin dependence of patients. It is an autoimmune disease in which insulin-producing cells of the pancreas are inactivated. However, the majority of diabetics have Type 2 diabetes, a multifactorial disorder associated with insulin resistance. Perhaps the greatest concern is the increase in obesity and Type 2 diabetes in children. It is widely believed that this is associated with lifestyle changes, in particular decreased exercise and increased food consumption. The big question is, can the progression of these diseases be arrested by mass changes in lifestyle or will a magic pill that enables us all to eat, sleep and keep healthy be required? The answer is likely a combination of the two and this represents a prime example of the public health and basic research sectors needing to interact and to work synergistically.

In addition to encouraging people to lead a healthier lifestyle, it is essential that we understand the molecular defects that underlie these diseases. Diabetes research has heralded some of the greatest discoveries in modern medicine. Extraordinary Australians have featured prominently among these. Ted Thompson, Chairman of the Department of Biochemistry at University of New South Wales for many years, was a driving force behind the sequencing of insulin, carried out in Fred Sanger's lab in Cambridge. John Shine, the current Director of the Garvan Institute of Medical Research in Sydney, was a pioneer of modern molecular biology being involved in the cloning of insulin in the late 70s at the University of California at San Francisco. These discoveries represent turning points in the way that patients with diabetes are treated today.

In this Showcase we present a real life story of Russ Macaulay, a Type 1 diabetes patient for 72 years and the father of Lance who is one of Australia's current diabetes researchers. Paul Zimmet and Don Chisholm tell us where the disease is headed and what the clinical picture portrays. Tom Kay and colleagues provide a detailed account of the molecular basis of Type 1 diabetes as well as our fundamental understanding of insulin action. From two different perspectives, the molecular basis for some of the complications of the disease is presented: Mark Cooper and colleagues concentrate on advanced glycation end products while Carsten Schmitz-Peiffer and Jonathan Whitehead deal with intracellular signalling pathways. These articles distil for us many of the basic problems that underpin what is clearly one of the biggest public health risks of the modern world.

**David James**

Diabetes and Obesity Research Program, Garvan Institute of Medical Research, NSW 2010

### Cover Illustration -

*Three dimensional structure of the insulin protein superimposed against a background of landmark papers in the field.*

*Graphics supplied by Julie Murray at Medici Graphics.*

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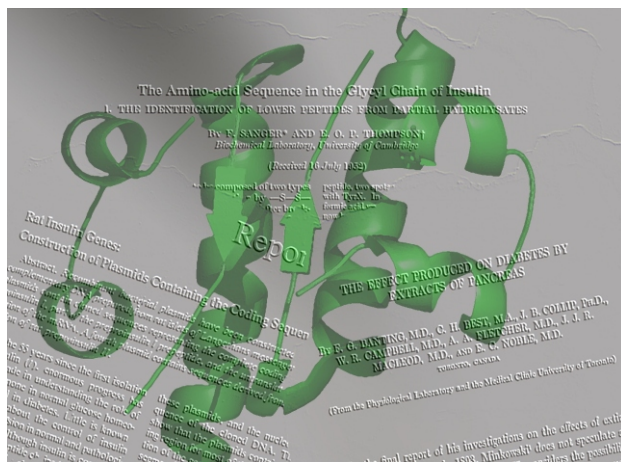
*Guest Editor: David James*

- A History of Diabetes Since the Discovery of Insulin  
*Lance Macaulay*
- Diabesity - An Evolving Socio-Economic and Public Health Tragedy  
*Paul Zimmet and Donald Chisholm*
- Type 1 Diabetes - Pathogenesis and Treatment  
*Eugene Estella, Spiros Fourlanos and Thomas Kay*
- Advanced Glycation - New AGE Focus for Diabetes  
*Merlin Thomas, Mark Cooper and Phillip Kantharidis*
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*In the Next Issue . . .*

In April, Showcase on Research will be on **Cell Division** – Guest Editor: Peter Beech



Front Cover Image