

In 2008 WAIMR celebrates 10 years since its inception and the many internationally-important discoveries which have transformed it into WA's premier adult medical research institute.



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Media Statement

NEW STUDY TO SEARCH FOR DIABETES “SIGNATURES”

In a world-first, WA researchers are pioneering an emerging science known as Systems Genetics in their search for “molecular signatures” of type 1 diabetes that could improve diagnosis and treatment.

Led by Professor Grant Morahan from the Centre for Diabetes Research Centre at the Western Australian Institute for Medical Research (WAIMR), the study is being conducted by PhD student Dr James Jooste in collaboration with Professor Tim Jones’ group from Princess Margaret Hospital’s Department of Endocrinology and Diabetes.

Professor Morahan said 100 WA children newly-diagnosed with type 1 diabetes would be asked to volunteer to help scientists determine how T cells, a type of white blood cell, caused the chronic disease.

“We know that people at risk of developing diabetes begin an autoimmune response which creates antibodies against insulin. Sometimes these antibodies are present for very long periods of time before some unknown factor causes the body’s T cells to switch into an aggressive mode which triggers diabetes. Afterwards, these T cells become quiet again,” he said.

“By studying the T cells of children who have just been diagnosed, we can find how these are different from non-aggressive T cells,” he said.

“We believe these cells will express a set of genes which are different from those after diabetes is established.

“If we can prove this prediction, it may reveal a type of so-called “molecular signature” that we can then use to develop ways to prevent or better treat type 1 diabetes.”

The research will also test whether these genes are expressed differently in children who have different types of diabetes susceptibility genes.

“This type of work aims to uncover whether there are specific molecular signatures for each genetic subtype of type 1 diabetes which is important as treatment can vary depending on the genetic blueprint a patient has,” Professor Morahan explained.

This aspect of the study is known as "Systems Genetics", which is being pioneered by Professor Morahan.

“Systems Genetics involves going beyond the idea that one gene influences one trait and looks at how diabetes susceptibility genes can have an effect on many genes and on the entire body,” he said.

“This Systems Genetics approach to analysis has not been applied to human disease before, but we believe it will provide important new findings.”

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Another arm of this research will look for changes in blood plasma which could reveal another type of molecular signature.

“Differences in gene expression also lead to protein changes in blood plasma, so we will also test for these changes and see if they are different in people with different diabetes susceptibility genes,” said Professor Morahan.

“All together, we expect these results will bring fresh insights into how type 1 diabetes arises, how we may better identify people who could already be on the road to developing it and how we may prevent it from occurring in those most at risk.

“We may also be able to find what the trigger is that converts the immune response from the passive state, marked by insulin antibodies, to the aggressive form that causes diabetes.”

BACKGROUND

Type 1 diabetes is caused by an immune response that goes wrong and whilst scientists do not yet know what causes this to happen, it is known that children who develop it have certain genes which make them susceptible.

Professor Morahan’s previous research has found that different versions of the immune system modifier gene, IL12B, could lead to either more interferon being made by T cells (in which case type 1 diabetes is more likely) or less interferon (in which case, people are less likely to get type 1 diabetes). The IL12B gene is also involved in other diseases, such as life-threatening asthma, and fatal cerebral malaria.

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