

NEWS RELEASE

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“Natural killer” immune cells are deficient in children with type 1 diabetes

Earlier research: vaccine targeting these cells in mice prevents diabetes

(Vancouver – January 26, 2011) – “Natural Killer” immune cells are both defective and fewer in number in children with type 1 diabetes, shows new research from the Child & Family Research Institute.

The finding builds on the team’s previous work where they found that a vaccine given to mice increased and repaired defective Natural Killer (NK) cells and prevented diabetes. This led the researchers to wonder whether children with type 1 diabetes had the same NK cell deficiency. NK cells play a critical role in the immune system. They produce molecules that activate the immune system and they kill cells infected by viruses, bacteria or parasites.

The researchers studied blood samples donated by 116 children with type 1 diabetes soon after diagnosis. The children are patients of BC Children’s Hospital, an agency of the Provincial Health Services Authority. The researchers compared their findings with blood samples from 145 non-diabetic children.

The children with type 1 diabetes had 37 per cent fewer NK cells. The research team also identified the biological mechanisms underlying the NK cell dysfunction.

“Since it’s been shown in mice that a vaccine can target the NK cells, it raises the potential for developing a vaccine that improves NK function and prevents diabetes in humans,” says Dr. Rusung Tan, the study’s senior author. “However, we need to find a compound that is suitable for humans.”

Dr. Tan is co-director of the Immunity in Health & Disease research cluster at the Child & Family Research Institute (CFRI), medical microbiologist at BC Children’s Hospital and BC Women’s Hospital & Health Centre, and professor, Department of Pathology at the University of British Columbia (UBC).

“The problem is, we don’t know who’s going to develop diabetes,” says Dr. Dina Panagiotopoulos, co-author on the study, CFRI clinician scientist, pediatric endocrinologist at BC Children’s Hospital, and UBC assistant professor of endocrinology.

“More work needs to be done with predictive technologies as the majority of children who develop type 1 diabetes don’t have a family history of it,” she says.

The research is published January 26 in the journal *Diabetes* of the American Diabetes Association. It is the first to examine the NK cell deficiency in a large number of humans with type 1 diabetes. Previous studies with fewer participants and older techniques hinted that NK cells could be defective. The modern techniques used in this study include better markers that are specific for NK cells, allowing for greater accuracy in the analysis.

Type 1 diabetes usually strikes in childhood when the immune system destroys the beta cells inside the pancreas. Beta cells produce insulin, which the body needs to take energy from food and to control blood sugar levels. To survive, children with type 1 diabetes must inject insulin and they face the risk of long-term complications.

This translational research was funded by the Juvenile Diabetes Research Foundation, Canadian Institutes of Health Research, the Child & Family Research Institute and BC Children's Hospital Foundation.

CFRI conducts discovery, clinical and applied research to benefit the health of children and families. It is the largest institute of its kind in Western Canada. CFRI works in close partnership with UBC; BC Children's Hospital and Sunny Hill Health Centre for Children, BC Women's Hospital & Health Centre, agencies of PHSA; and BC Children's Hospital Foundation. CFRI has additional important relationships with British Columbia's (B.C.'s) five regional health authorities and with B.C. academic institutions Simon Fraser University, the University of Victoria, the University of Northern British Columbia, and the British Columbia Institute of Technology. For more information, visit www.cfri.ca.

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