Pathogenesis of Type 1 Diabetes - Testing the Hygiene Hypothesis

From 2008-03-01 to 2014-02-28, closed project | DIABIMMUNE Website

Objective

Preliminary data indicate that there is a strong association between the incidence of immune-mediated diseases and improving standard of living and hygiene. One of the steepest gradient in standard of living worldwide is present at the border between Russian Karelia and Finland with a sevenfold difference in the gross national product, while Estonia represents a country in rapid transition. These three populations comprise a “living laboratory” providing a unique possibility to test the hygiene hypothesis in the development of immune-mediated diseases. The incidence of type 1 diabetes (T1D) is six times lower in Russian Karelia than in Finland, whereas there are very limited differences in the frequency of risk HLA genotypes in the background population. This proposal aims at comparing (i) the frequency of beta-cell autoimmunity and other organ-specific autoantibodies; (ii) the frequency of IgE-specific sensitisation and signs of allergy; (iii) the frequency of various infections; (iv) the gut microbial flora; and (v) dietary intake in young children between the three populations. The birth cohort arm of the study aims at (i) delineating the ontogeny of the immune system by using modern tools of functional genomics; (ii) comparing the functional characteristics of regulatory T cells; (iii) characterising the gut microbial colonisation in infants; (iv) assessing the timing of exposure to foreign proteins in infancy (v) defining the interrelations between dietary factors, gut microbial flora and acute microbial infections. The objectives will be approached by studying 1600 children at the age of 3 and 5 years and by observing a birth cohort comprising about 320 subjects with HLA-conferred susceptibility to autoimmunity from birth up to the age of 3 years in each country. This proposal is expected to provide new data on the reasons and mechanisms behind the increasing rates of T1D and other immune-mediated diseases seen in most developed countries after World War II.

Related information

Result In Brief
Hygiene increases chances for autoimmunity

Report Summaries
Final Report Summary - DIABIMMUNE (Pathogenesis of Type 1 Diabetes - Testing the Hygiene Hypothesis)
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**Subjects**

- Life Sciences - Medicine and Health

**Last updated on** 2017-05-30

**Retrieved on** 2019-07-12

**Permalink:** https://cordis.europa.eu/project/rcn/86776_en.html

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