alleles, birth data, and mother's age) there was still no difference in mean zinc level among cases and controls.

Both *HLA-DQB1* alleles and gestational age in weeks were found to affect the risk of developing type 1 diabetes significantly. In addition low perinatal zinc status was associated with earlier age at onset of type 1 diabetes, also after adjusting for possible confounders ($p = 0.02$).

Conclusion: The risk of developing type 1 diabetes in Danish children was not associated to perinatal zinc status. Though, cases with low perinatal zinc status had significantly earlier age at onset of type 1 diabetes.

P121
Serum biomarker correlates of insulin secretion in individuals at risk of type 1 diabetes

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Type 1 diabetes mellitus (T1D) is characterised by β-cell dysfunction in the prediabetes phase. These abnormalities, along with islet antibody (AB) positivity determine risk of progression to diabetes, however there is considerable variation in the rate of β-cell decline. Progression to diabetes is associated with reduction in total insulin secretion (ISR AUC) derived from the oral glucose tolerance test. This reduction is associated with an increase in beta-cell death Additional biomarkers are needed to more accurately predict disease progression, elucidate heterogeneous mechanisms of disease and identify potential response to immunotherapy. In a Brisbane cohort of first-degree relatives (FDR) at risk of T1D, we profiled serum for potential discriminatory biomarkers. We identified three typical signatures, comprising a group of inflammatory cytokines/chemokines demethylated insulin DNA, and metabolic factors. To determine the relationship of these serum markers to diabetes progression, we profiled serum from at-risk FDR from the Trialnet Natural History Study comprising 30 AB−, 30 AB1+, 30 AB2+ and 30 children who progressed to T1D. ISR AUC was significantly lower in progressors than the non-progressor groups (ANOVA, $p = 0.0008$), however there was considerable variation amongst those who progressed to T1D. We found significant correlations between AUC insulin and twenty serum markers. Using a multiple linear regression model, we identified three inflammatory cytokines/chemokines and three clinical parameters which explained AUC insulin ($R = 0.85$, $p = 2 \times 10^{-16}$). Our findings demonstrate that a combination of inflammatory and metabolic factors contribute to reduced insulin secretion in the pre-diabetic phase, however there is significant variation in the rate of beta cell functional decline.

P122
Prevalence of celiac specific HLA genotypes in young patients with type 1 diabetes from Innsbruck and Graz, Austria

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Hypothesis: Due to a high linkage disequilibrium of diabetes and celiac specific HLA genotypes type 1 diabetes (T1D) is highly associated with celiac disease (CD). The European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) has very recently revised the screening guidelines for CD, therefore the aim of our study was to investigate the distribution of celiac specific HLA genotypes in young patients with T1D.

Methods: Paediatric patients with T1D seen at the Medical University of Innsbruck and Graz have been genotyped for celiac specific HLA genotypes HLA DQ2 and DQ8. All patients gave written informed consent to genetic testing. Biometric data, age at diagnosis, diabetes duration were collected.

Results: 121 patients with T1D, 52.1% male, mean age 13.3 (SD 3.9) years, mean age at diabetes onset 7.4 (SD 3.8) years and a mean diabetes duration of 5.9 (SD 3.3) years were included in our analysis and genotyped for HLA DQ2 and DQ8 alleles. 92% of the individuals were tested positive for HLA DQ2 and/or HLA DQ8. 34% showed the HLA risk type DQ2; HLA DQ2 cis 27%, HLA DQ2 trans 6% and HLA DQ2 homozygote 1%. 36% were HLA DQ2+ DQ8 positive; 33% HLA DQ2 cis + DQ8 and 2.5% HLA DQ2 trans + DQ8). 22% of patients were tested DQ8 positive. Only 8% were tested negative, in total 4 patients were diagnosed with celiac disease proven by biopsy.

Conclusions: The vast majority of patients with T1D were tested positive for celiac specific HLA risk genotypes DQ2 and/or DQ8. HLA-Screening as a first-line test, as recommended by the Guidelines from ESPGHAN does not seem to be appropriate in the T1D population. HLA genotyping cannot replace celiac specific antibody testing in the majority of T1D patients. We therefore conclude, that only a very small proportion of patients will benefit from HLA genotyping, while the majority of patients will not.

P123
Serum Interleukin 13 level in children and adolescents with type-1 diabetes mellitus and/or atopy

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Objectives: Interleukin 13 (IL-13) is a T helper 2 (Th2) cytokine that is a mediator of allergic inflammation and disease. Interleukin-13 release was reduced in type-1 diabetes mellitus (T1DM) while numerous reports showed exaggerated IL-13 production in asthma, atopic rhinitis and allergic dermatitis. We aimed to study serum IL-13 level in children and adolescents with type-1 DM with or without

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