

# Comparative Bioinformatic Analysis of the Metabolome in Diabetic Tamil and Swiss Cohorts

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Type 2 diabetes mellitus (DM) is a chronic metabolic disorder, whose prevalence has drastically increased among native and migrant South Asian populations over the last two decades. Moreover, the onset of type 2 diabetes is seen earlier in Asians than in Caucasian populations and they typically develop the disease 5-10 years earlier and at a lower BMI.

The primary objective of this study is to show variations in the metabolic components in plasma between native Tamil population and native Swiss population through a classical clinical chemistry approach and to reveal the association between the specific metabolite profile of the Tamil ethnicity with type 2 diabetes in this population. Type 2 diabetes is known to have specific metabolic variations and we assume that South Asians and Caucasians differ in these alterations.

Our study is a case-control study comprising of 19 type 2 diabetic native Swiss subjects and 15 type 2 diabetic native Tamil subjects living in Bern, Switzerland with a homogeneous genetic background. The bioinformatic workflow includes of normality testing followed by non-parametric testing, Kendall tau-correlation matrix, principal component analysis and finally categorical data analysis. The bioinformatic analyses were conducted using R and its related CRAN packages.

There were no significant associations of blood glucose with the metabolite profile and anthropometric measures found in the Swiss cohort. Whereas, in Tamil cohort we found that there was a significant positive correlation between blood glucose and the lipid profile. Additionally a negative correlation between blood glucose and anthropometric measures mainly BMI and hip circumference were also observed. The lipid profile measure namely "LDL" also showed a negative correlation with anthropometric measures similar to the blood glucose in Tamil cohort. These findings were further confirmed by the principal component analysis.

This result confirms our objective as we found a specific metabolic variation of Type 2 diabetes in Tamil cohort in comparison to Swiss cohort.

Altogether this thesis provides a better understanding about type 2 diabetes in Tamil cohort and paves a way for better research in the field of metabolic variations in Type 2 diabetes among various ethnic groups.

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