The gut microbiome can predict changes in glucose regulation

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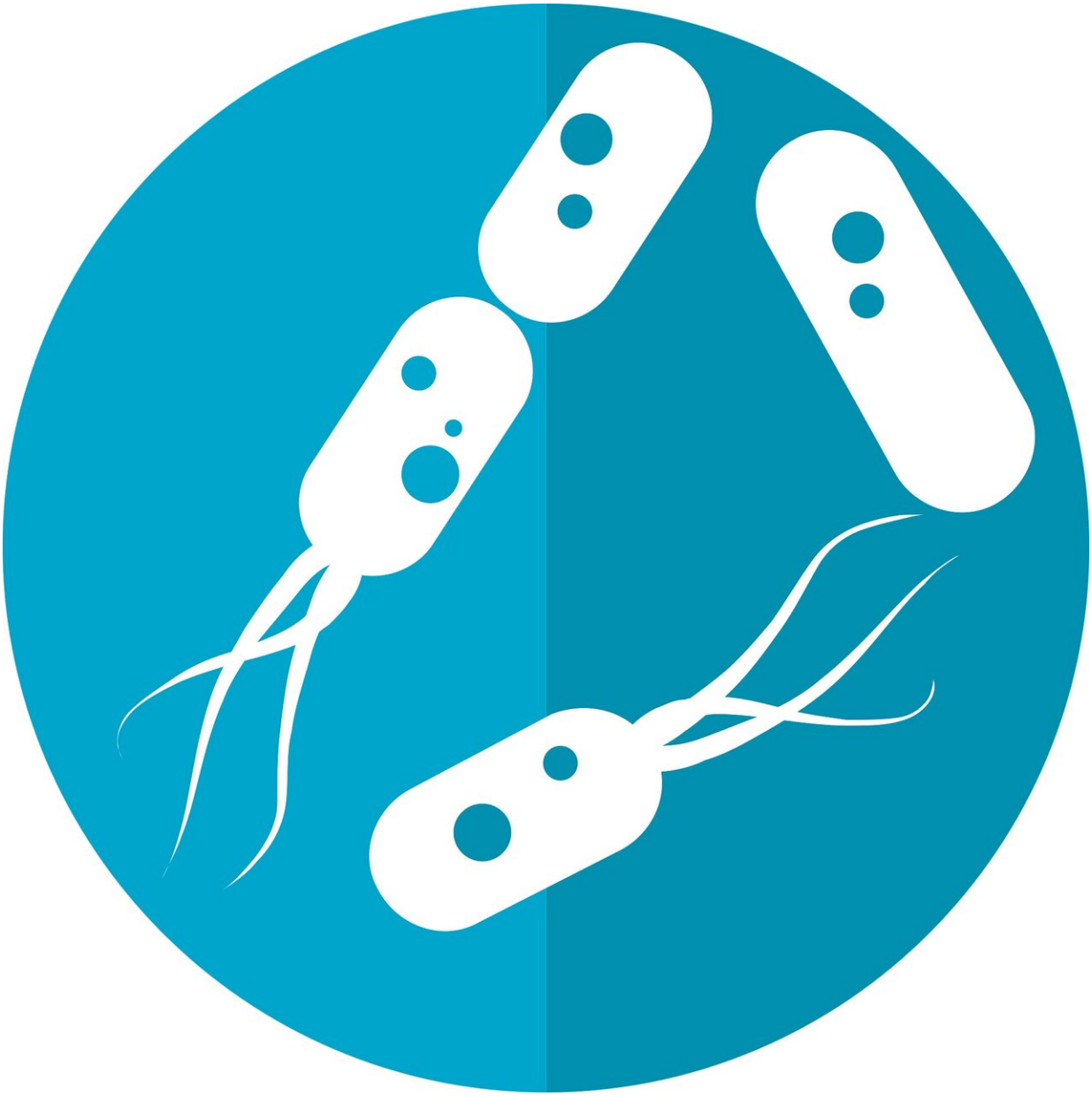

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A study carried out by researchers from the Institute of Genomics, University of Tartu revealed that the human gut microbiome can be used to predict changes in type 2 diabetes related glucose regulation up to four years ahead.

Type 2 diabetes is a metabolic disease characterized by elevated blood glucose levels that contributes to millions of deaths worldwide each year and its prevalence is rapidly increasing. Type 2 diabetes is preceded by "prediabetes"—a condition when the glucose levels have started to rise, but the progression of the disease can still be stopped and inverted. Therefore, early detection of the disease progression is necessary and previous research suggests that gut microbiome could be used for that purpose, said Elin Org, last author of the paper and associate professor in genomics and microbiomics.

This study aimed to assess whether gut microbiome could be used to predict changes in metabolic parameters such as plasma insulin and glucose levels in the early stages of the disease. "This is one of the first studies that assess the role of the gut microbiome in type 2 diabetes over time," said Oliver Aasmets, the first author of the paper.

Results showed that gut microbiome can predict changes in glucose regulation primarily related to insulin levels and insulin secretion. "Our study design allowed us to compare predictions made a year and a half and four years ahead, which showed significant differences, giving input for further studies," said Aasmets. Furthermore, the study showed which microbes are the most useful for predicting changes in the metabolic parameters.

"Using gut microbiome as a risk factor for predicting various diseases is a promising research area, but further studies in different populations and with larger sample sets are needed in order to validate the results and to further develop the prediction models," said Org.

More information: Oliver Aasmets et al, Machine Learning Reveals Time-Varying Microbial Predictors with Complex Effects on Glucose Regulation, *mSystems* (2021). DOI: 10.1128/mSystems.01191-20

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