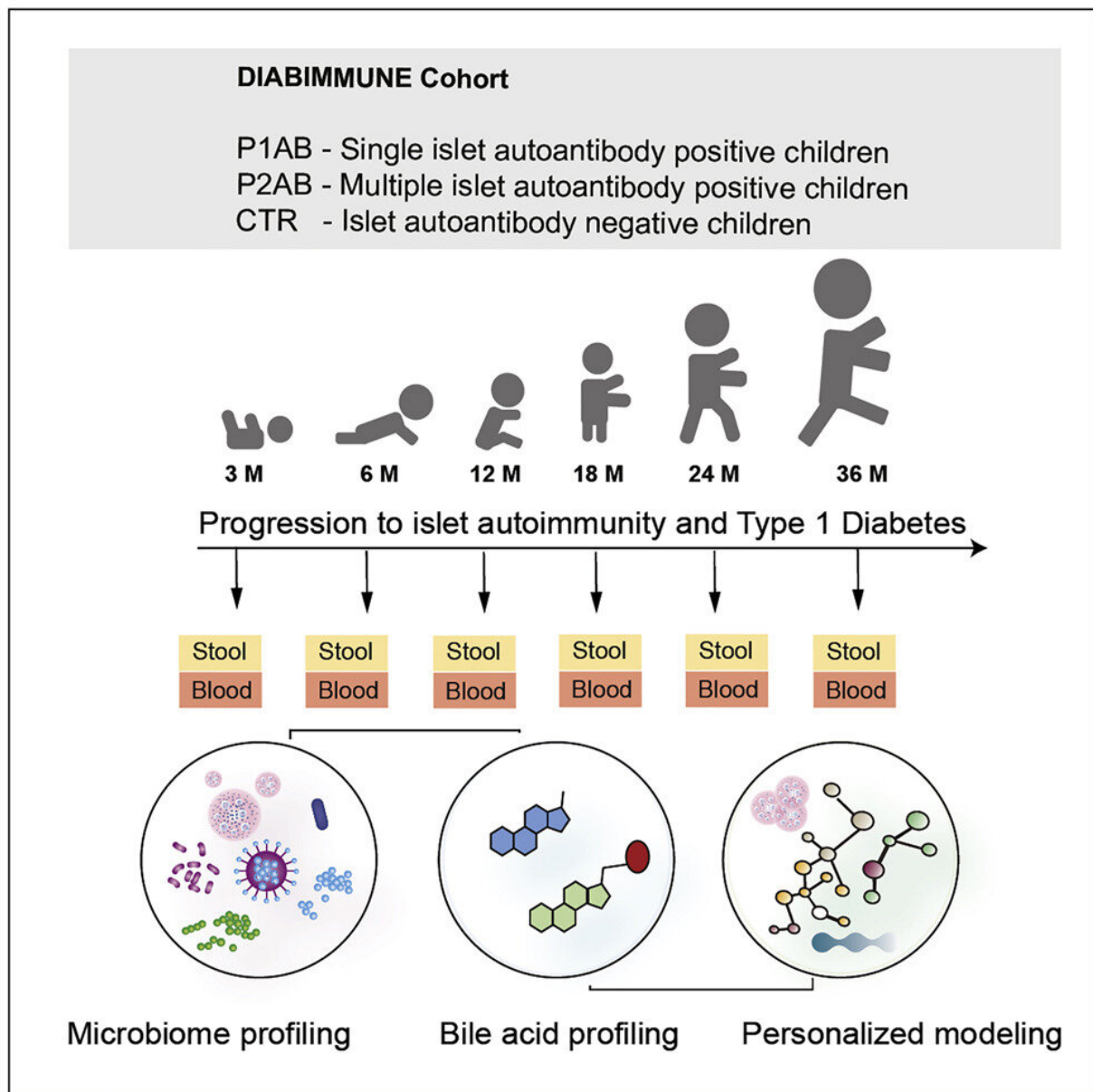


Changes in bile acids may be linked to diabetes in young children

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Graphical abstract. Credit: *Cell Reports Medicine* (2022). DOI: 10.1016/j.xcrm.2022.100762

Disturbances in the interaction of bile acids with the inborn microflora in the intestines can increase the risk of type 1 diabetes. This is shown in a new study on children's first years of life.

"We have gained new knowledge about how the disease begins to develop," says Matej Orešič, professor of medical science at Örebro University.

An international research team led by Örebro University has investigated how bile acids are regulated in [young children](#). And there is a link in the development of type 1 diabetes, according to the study published in the scientific journal *Cell Reports Medicine*.

"We have not studied the disease itself. Instead, we have investigated what happens before the disease develops," says Matej Orešič.

It is the interaction of bile acids with children's inborn microflora in the gut that the researchers have studied in more detail.

At birth, the [gut flora](#) is already beneficial for health and immune system regulation. Bile acids, which are formed in the liver, play a crucial role in digestion. For example, they help the body absorb fats and fat-soluble vitamins in the [small intestine](#).

When bile acids come into contact with gut bacteria, they are modified. This allows bile acids to assist effectively in glucose and fat metabolism.

New research shows that it is this change in the bile acids, brought about

by microorganisms or microbes, that is very important. Because in children who later develop type 1 diabetes, it is possible to see early on that the interaction between microbes and bile acids is disturbed.

"We had not expected that there would be such a clear link between gut microbes and bile acids before type 1 diabetes developed," says Matej Orešič.

The researchers have taken samples from children between three months and three years. Blood and stool samples were collected on six occasions from each child. The research group analyzed the gut flora and performed extensive chemical analyses.

The results show that children who later developed type 1 diabetes have different bile acid composition than healthy children. In particular, the [bile acids](#) modified by gut flora showed distinct differences—as early as the first six months after the children's birth.

In total, samples were taken from 71 [children](#). Although the study is relatively small, its longitudinal design with multiple samples per each child collected makes it informative, which the researchers now hope will be followed up by further studies.

"This can provide better methods for predicting [diabetes](#) as well as assessing the risk of being affected. The next step will be the development of preventive measures," says Matej Orešič, professor of medical science at Örebro University.

More information: Santosh Lamichhane et al, Dysregulation of secondary bile acid metabolism precedes islet autoimmunity and type 1 diabetes, *Cell Reports Medicine* (2022). [DOI: 10.1016/j.xcrm.2022.100762](#)

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