



## Nestlé – EpiGen study shows that the development of the infant gut microbiota is related to the amount of body fat later in life

Feb 3, 2015

It is now readily accepted that intestinal microbes play a significant part in determining human health. Indeed, components of this microbiota have been associated with alterations in metabolism and with the development of obesity and insulin resistance.

It follows that identifying factors which influence the composition of the microbiota, particularly during the formative period after birth, is important for the development of interventions and products which promote health. To this end, scientists from the international EpiGen Consortium, together with scientists at Nestlé Research Center, Lausanne, Switzerland, have studied the role of environmental factors such as gestational age and mode of delivery on the establishment and the composition of the microbiota in the infant gut. Importantly, the scientists observed that the rate at which certain bacteria are acquired, is related to the amount of body fat at 18 months of age. The results of the study have been published in the journal [mBio](#).

### Acquisition of a mature gut microbiota and its association with adiposity

The present study examined the acquisition of the gut microbiota in 75 infants participating in the Growing Up in Singapore Towards healthy Outcomes (GUSTO) birth cohort. This cohort, led by scientists at A\*STAR's Singapore Institute of Clinical Sciences, in collaboration with researchers from KK Women's and Children's Hospital and the National University Health System, aims to investigate the role of developmental factors in early life on the onset of metabolic diseases later in life.



Factors before and at birth influence the development of the intestinal microbiota

but after a longer duration of gestation acquired a more mature gut microbiota at a faster rate. In contrast, infants who were delivered by Caesarean section and after a shorter duration of gestation had a delay in the development of their gut microbiota.

Nestlé scientists working in the First 1000 days and Healthy Kids research programme at Nestlé Research Center, in collaboration with EpiGen researchers, used a technique called 16s rRNA sequencing to analyse the microbial composition of stool samples collected from infants at three days, three weeks, three months and six months of age. As the composition of the infant microbiota matures, there is a switch from aerobic to anaerobic bacteria, and a predominance of *Bifidobacterium* and *Collinsella*

species. The results of the study showed that infants who had a vaginal delivery and who were born at term

but after a longer duration of gestation acquired a more mature gut microbiota at a faster rate. In contrast, infants who were delivered by Caesarean section and after a shorter duration of gestation had a delay in the development of their gut microbiota.

Rapid acquisition of anaerobic bacteria in the infant gut is predictive of normal adiposity later. Importantly, while the composition of the gut microbiota was similar for all infants by six months of age, those infants who showed a delay in acquiring anaerobic *Bifidobacterium* and *Collinsella* species, tended to have lower adiposity at age 18 months.

Taken together, the findings of the study suggest that factors before and at birth influence the development of the intestinal microbiota and this, in turn, may influence the amount of body fat later in life. An explanation for this relationship is not known at the current time. Further studies will be needed to delineate the mechanisms underlying these phenomena and their association, and to propose beneficial products and interventions for maternal and infant health. Importantly, the results provide further confirmation that components of the early gut microbiota are strongly influenced by environmental factors, even in healthy infants.

## **About EpiGen**

[EpiGen](#) is a global consortium of leading researchers based at five centres in three countries (Auckland UniServices Limited, New Zealand; University of Southampton, and the Medical Research Council Lifecourse Epidemiology Unit - University of Southampton, United Kingdom; Singapore Institute for Clinical Sciences of the Agency for Science, Technology and Research (A\*STAR), and the National University of Singapore). EpiGen strives to advance understanding of the developmental and environmental processes that influence health through the life course.

## **Article reference**

[Dynamics of infant gut microbiota are influenced by delivery mode and gestational duration and are associated with subsequent adiposity](#). Dogra S., Sakwinska O., Soh S-E., Ngom-Bru C., Brück WM., Berger B., Brüssow H., Lee Y-S, Yap F., Chong Y-S, Godfrey KM, Holbrook JD\*, on behalf of the GUSTO study group