Module 2: Introduction to the microbiome – why 16S?
Learning Outcomes

Describe the importance of the microbiome and why it should be studied – why 16S

• Defining the term “microbiome” (and other related terminology)

• Current hypothesis around the ways we may be acquiring our microbes; how it may change due to lifetime exposures (for example, the GIT microbiome has been described as an extremely plastic entity); and how these microbial profiles may be similar or vary between individuals

• Know that different body sites have unique microbiomes

• Appreciate the importance of studying the microbiome (what are the clinical impacts).
Module 2:
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Part 2.1
The human microbiome: meeting our microbes
The human microbiome: meeting our microbes

The human microbiome: meeting our microbes
The human microbiome: meeting our microbes
The human microbiome: meeting our microbes

The human microbiome: meeting our microbes

This baby had visitors already!!!


Transplacental transfer of maternal systemic microbiota
Maternal GIT microbiota uptake via dendritic cells
Ascending maternal vaginal microbiota

Source: Claassen et al.
A critical assessment of the “sterile womb” and “in utero colonization” hypotheses: implications for research on the pioneer infant microbiome

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The human microbiome: meeting our microbes

Lauder et al. (2016) Microbiome. 4(29)

16SrRNA Intermediate Bioinformatics Online Course:
Int_BT_2019
Shantelle Claassen-Weitz
The human microbiome: meeting our microbes

Probiotics during pregnancy

Placebo during pregnancy

The human microbiome: meeting our microbes

The human microbiome: meeting our microbes

In summary:

- We are more microbes than human.
- Studies, using 16S sequencing technology, have shown that we may acquire our microbes during the process of delivery and that profiles may be dependent on delivery mode.
- In addition, studies (which include studies using 16S technology) have recently reported that in-utero colonization may occur prior to colonization during the process of delivery.
- Studies investigating samples sites such as placental samples, cord blood and amniotic fluid, which are all regarded as “low-biomass” specimens, need to have optimal study designs and sequencing controls in place.
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Part 2.2
The human microbiome: friend or foe?
The human microbiome: friend or foe?

Gestational duration
Prenatal antibiotic treatment
Maternal prenatal stress
Maternal diabetes status

Mode of delivery
Milk feeding
Antibiotics?
Solid foods
Antibiotics?
Antibiotics?
The human microbiome: friend or foe?

The human microbiome: friend or foe?

Mum's Guide to INFANT MICROBIOME SEEDING

Wearing gloves, fold a piece of gauze into a fan shape.
Dampen the gauze with saline solution.
Still wearing gloves, insert the damp gauze into the mothers' birth canal
Leave for 30 minutes.
Remove carefully and store in a sterile jar until needed.
When the baby is born, use gloved hands to wipe the seeded gauze all over the baby's head and body moistening the gauze with further saline solution if necessary.

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The human microbiome: friend or foe?

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Partial restoration of the microbiota of cesarean-born infants via vaginal microbial transfer

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