Gut Microbiota: No longer the forgotten organ

Microbiota in the gut play an important role in our health, starting from the first moments of life.

What factors influence the gut microbiota?

- Gestational age (preterm vs term)
- Mode of birth
- Diet (breastfeeding or formula)
- Maternal diet
- Host genetics
- Antibiotics
- Home environment (pets, siblings)
- Local environment (urban/rural)
- Geographical location

Why is bifidobacteria important?

In healthy, breastfed infants delivered by vaginal birth, bifidobacteria represents up to **90%** of total gut microbiota

The predominance of bifidobacteria in infant gut microbiota is linked to protection against infection and immune related diseases

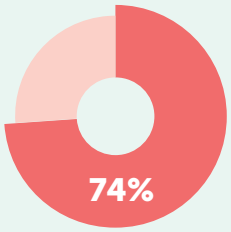
Delivery mode determines which microbes initially colonize the gut

Vaginal birth

Exposure to maternal gut microbes → Infant gut is colonized by specific maternal mictobes (bifidobacteria and *Bacteroides* species)

C-section birth

Exposure to skin microbes, microbes from the hospital environment → Lower abundance of bifidobacteria and almost total lack of *Bacteroides* species



Rise in C-section rates between 2000 and 2015

How does nutrition impact the early microbiota?

Human milk oligosaccharides (HMOs): Promote a predominance of bifidobacteria -> protection against infectious and immune related diseases

Formula feeding: Infants have a more diverse gut bacteria

Complementary feeding: Introducing dietary fibers and proteins -> more diverse, adult-like microbial community

Dysbiosis: An imbalance in gut microbiota can lead to gastrointestinal and extraintestinal diseases

- Diarrhea
- Obesity/malnutrition
- Inflammatory diseases
- Infections and infectious diseases
- Allergic diseases
- Automimmune diseases
- Neurological diseases
- Metabolic diseases

Strategies to support a healthy gut microbiome from early life

- Promote breastfeeding
- Encourage vaginal delivery
- Avoid unnecessary exposure to antibiotics
- Introduce timely appropriate complementary feeding

What characterizes the microbiome of healthy and malnourished children?

Healthy children

- ✓ Higher diversity
- ✓ Prevalence of certain strains (*Bacteroidetes*, bifidobacteria)
- ✓ Steadily evolves over time

Malnourished children

- Lower diversity
- Different microbial profile from that of healthy children
- Age-delayed

Gut microbiome development in early life is linked to long-term health. Mode of birth, diet type and the use of antibiotics are some of the most important factors contributing to the establishment of an infants gut microbiota.

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