

GUT MICROBIOTA

Ordered development of gut microbiota observed in premature infants

“The first few days and weeks of life host a profound event in human biology,” says Phillip Tarr, corresponding author of a study investigating the bacterial colonization of the gut in premature infants. Tarr and his colleagues wanted to understand more about how the human digestive tract transitions from a near-sterile organ at birth to one with a diverse microbial community. “Children residing in a microbiologically constrained ‘ecosphere’ of a neonatal intensive care unit are ideal to study host-related factors free of the many different microbes that might be encountered in the community by term infants,” he explains.

The researchers sequenced bacteria in 922 stool specimens from 58 premature infants. They looked for patterns that could be discerned by eye as well as applying more thorough statistical tests.

The main findings are that the gut microbiota develops in an ordered fashion through successive bacterial classes

(from Bacilli to Gammaproteobacteria to Clostridia). Furthermore, various factors such as mode of birth, diet and antibiotics seemed to influence the pace, but not the overall pattern, of progression. Notably, time since conception had the strongest influence on this pace of progression, suggesting that host biology might be more important than exogenous factors in driving gut microbiota development in premature infants.

“We are now looking at the populations of microbes in children who had a worse clinical course compared to those in this paper,” says Tarr. “We also want to determine if these early-in-life microbial populations persist and have a role in later-in-life events.”

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