Maternal gut microbes shape gut microbiota in zebra finch chicks

Cheng-Yu Chen
Chih-Kuan Chen
Yi-Ying Chen
Andrew Fang
Grace Tzun-Wen Shaw
Chih-Ming Hung
Daryi Wang

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Abstract

Microscopic changes occurring inside newborns may have a huge effect on how they develop. Microbes residing inside the developing newborn – gut microbiota – are influenced by their delivery, diet, environment, and parenting, and the species within a developing newborn can influence host health, fitness, and behavior. However, exactly how microbes are passed to newborn birds remains unclear. A recent study examined this phenomenon in zebra finch chicks. Zebra finches are sometimes reared by their biological parents, but they can also parasitize the nests of a different society finch species – procuring “foster parents” for their chicks. Using DNA sequencing, researchers compared the gut microbiota of chicks reared by these two types of parents along with hand-reared chicks. They found that chicks’ gut microbiota mirrored those of the parents that reared them. The parents’ oral cavities had the greatest contribution to the earliest gut microbes of the chicks, while in later stages, parental gut microbiota dominated in the chicks, suggesting that oral feeding is most impactful early on. These results highlight the importance of indirect maternal transmission for providing chicks with probiotic microbes and may also explain why certain species that can transfer probiotics to chicks may become preferred hosts for parasitic birds.