

 GUT MICROBIOTA

FMT — enduring strains

Donor and recipient microbial strains have been found to coexist for at least 3 months after faecal microbiota transplantation (FMT) in humans, according to new research published in *Science*.

FMT is increasingly popular as a treatment for recurrent *Clostridium difficile* infection with high success rates. Exactly what happens to the resident and transplanted gut microbiota after FMT is largely unknown, and characterization is needed to better understand its application.

In a bid to fill this knowledge gap, Li *et al.* used shotgun metagenomic sequencing to quantify and characterize the extent of changes to the structure of the gut microbiome after FMT at a population level and in terms of species and strains. The investigators

took advantage of a set of faecal samples ($n = 55$) from a recent study of FMT in patients with metabolic syndrome; patients received either allogeneic FMT or autologous FMT (acting as placebo). Importantly, participants in this study did not take antibiotics or other medications (confounding factors that could affect outcome) for at least 3 months before and during FMT.

The researchers found that donor microbial strains can colonize the gut of the recipient, and indeed became established within the recipient gut microbiota and persisted over the 3-month observational period, either replacing or existing alongside the resident gut microbes. Notably, outcomes varied across the donor–recipient pairs, with individual patterns of establishment and donor–recipient compatibilities.

Interestingly, introduced donor microbial strains were more likely to establish in the new recipient environment if the species were already present in the resident gut microbiota, often replacing the related strains. However, if the donor species were novel to the recipient then they were unlikely to prosper and establish within the microbial community.

The new findings indicate that donor–recipient microbiota compatibility is an important factor and point to the development of a more personalized precision approach to FMT.

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ORIGINAL ARTICLE Li, S. S. *et al.* Durable coexistence of donor and recipient strains after faecal microbiota transplantation. *Science* **352**, 586–589 (2016)