

Post-Antibiotic Gut Mucosal Microbiome Reconstitution Is Impaired by Probiotics and Improved by Autologous FMT

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Cell

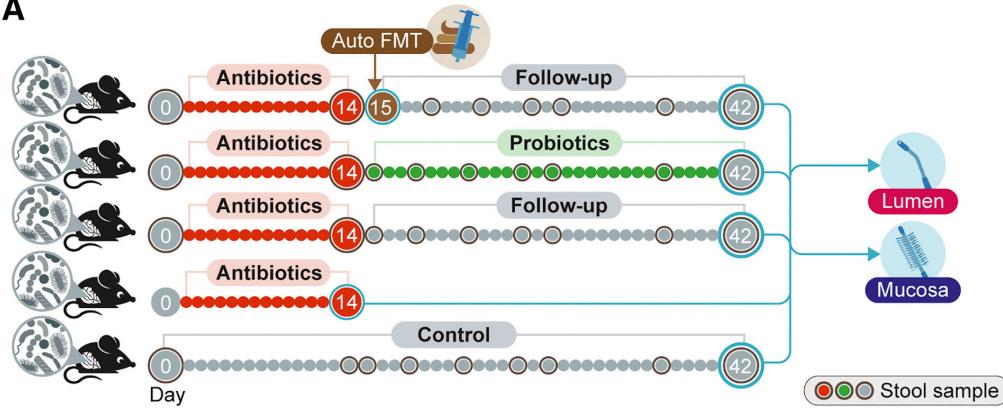
Volume 174, Issue 6, Pages 1406-1423.e16 (September 2018)

DOI: 10.1016/j.cell.2018.08.047

We invasively examined **the effects of multi-strain probiotics or autologous fecal microbiome transplantation (aFMT) on post-antibiotic reconstitution** of the murine and human mucosal microbiome niche. Contrary to homeostasis, **antibiotic perturbation enhanced probiotics colonization** in the human mucosa but only mildly improved colonization in mice. Compared to spontaneous post-antibiotic recovery, **probiotics induced a markedly delayed and persistently incomplete indigenous stool/mucosal microbiome reconstitution** and host transcriptome recovery toward homeostatic configuration, while **aFMT induced a rapid and near-complete recovery** within days of administration. In vitro, Lactobacillus-secreted soluble factors contributed to probiotics-induced microbiome inhibition.

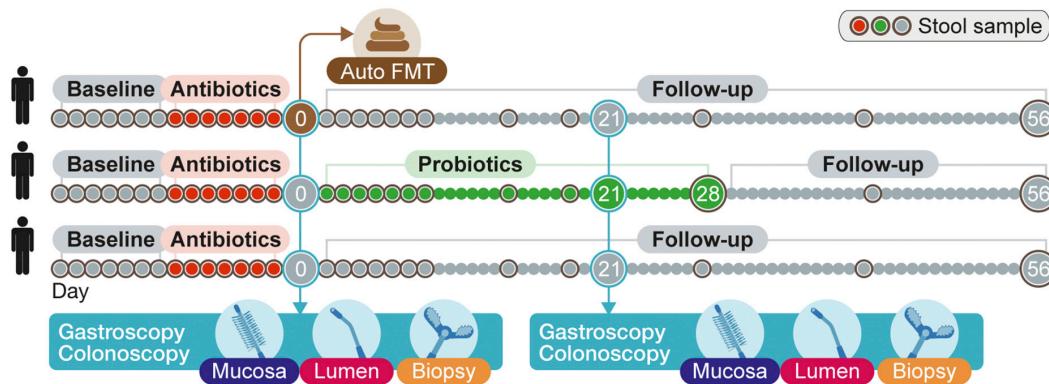
MOUSE

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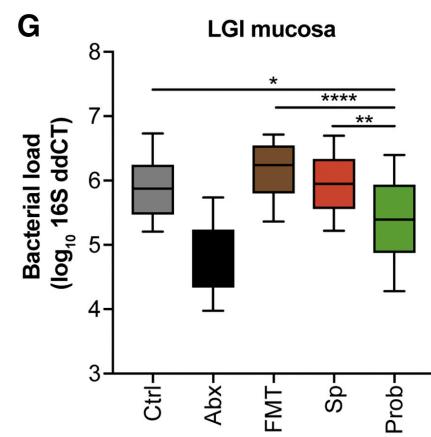
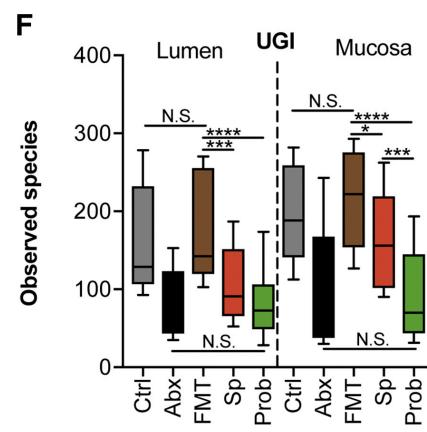
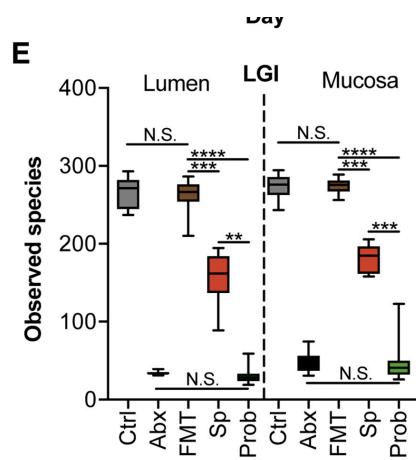
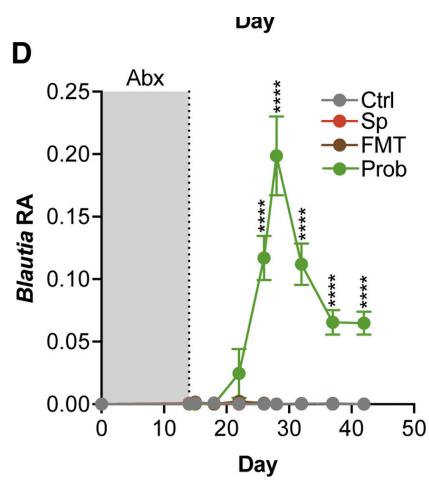
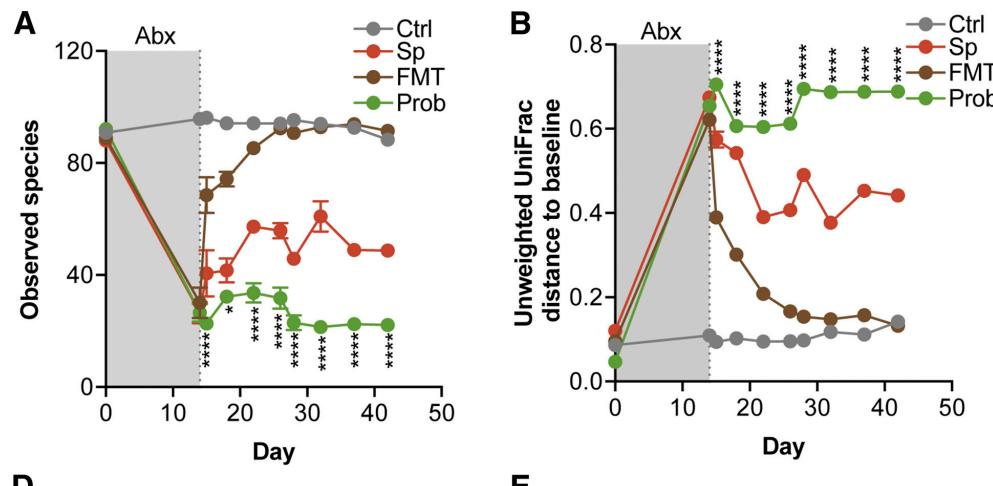


HUMAN

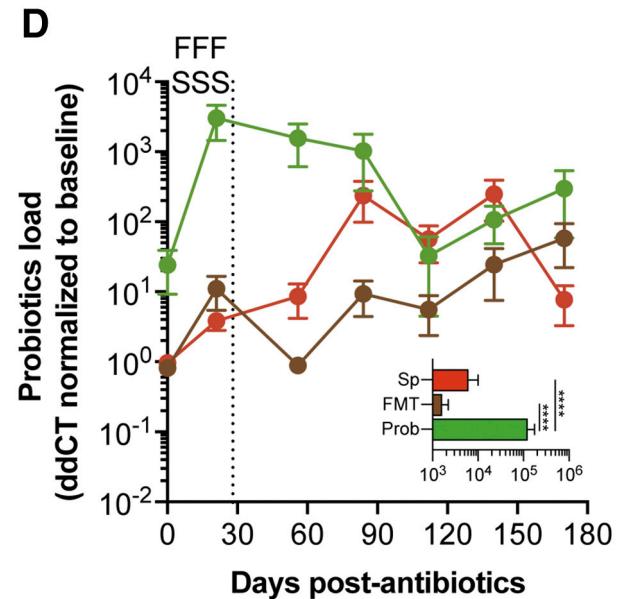
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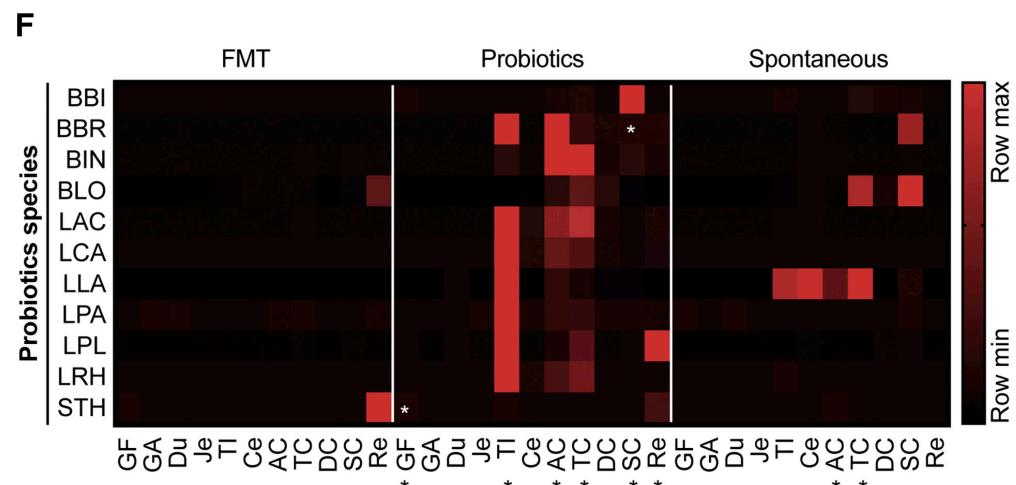
In mice, probiotics delay “recovery” of microbiome after abx. Also shown with non-probiotic fraction of the community.



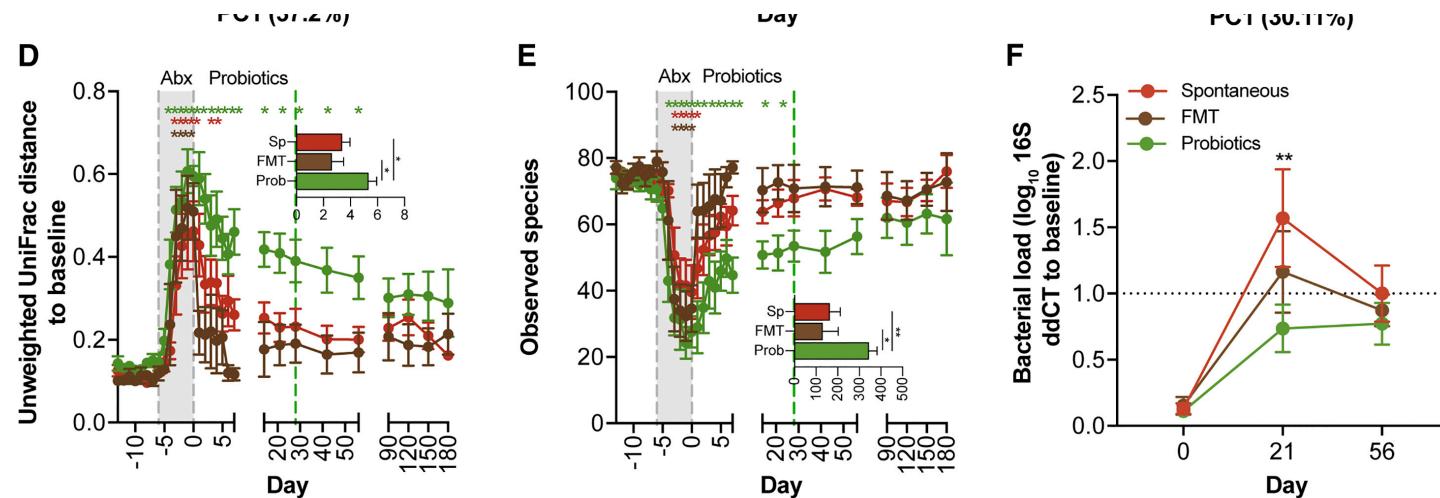
Probiotics colonize humans after abx



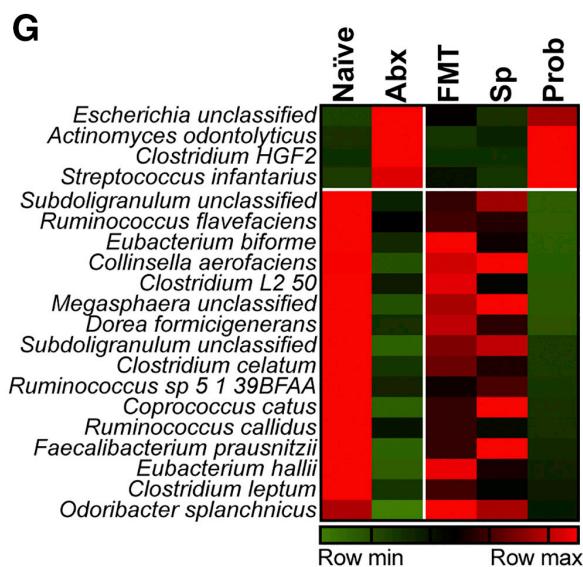
Not all probiotics colonize
and colonization is tissue-
specific



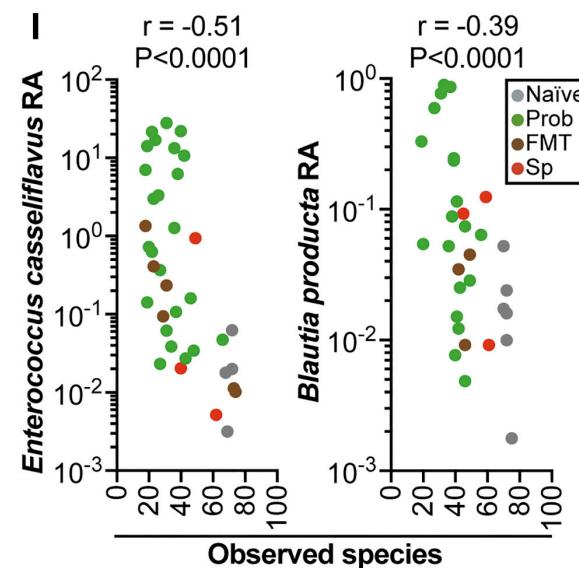
Probiotics delay microbiome recovery in humans



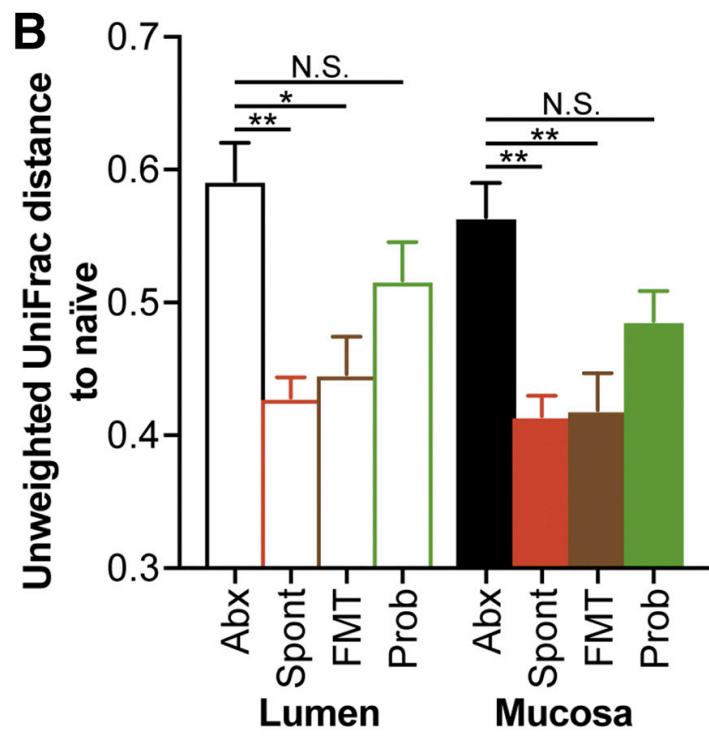
This is associated with certain species



Some species anti-correlate with alpha diversity



Pattern holds for mucosa



Changes composition of community

Filtrate of some probiotics depresses growth of human microbiome

