Microbiome approaches to treat colonization with antibiotic resistant bacteria

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Antibacterial resistance is a global threat, chiefly due to diminishing numbers of effective treatments

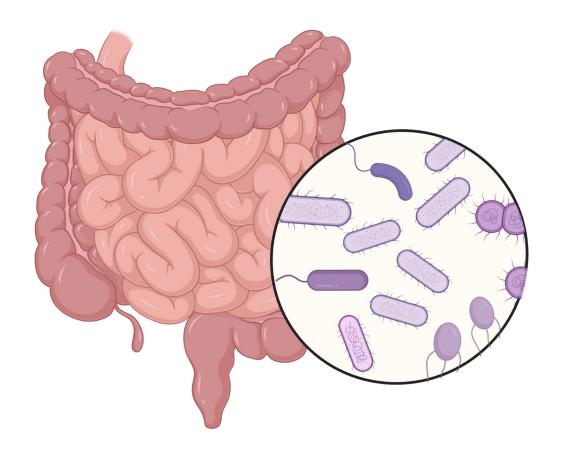
Nothing in Antimicrobial Resistance makes sense except in the light of

Nothing in Antimicrobial Resistance makes sense except in the light of Colonization

INFECTION **COLONIZATION**

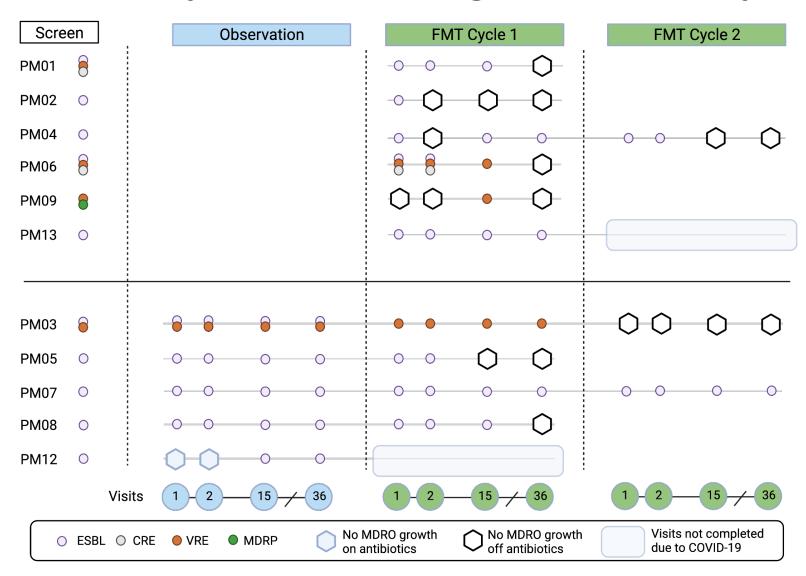
What can be done for patients and colonized with multi-drug (pan) resistant organisms?





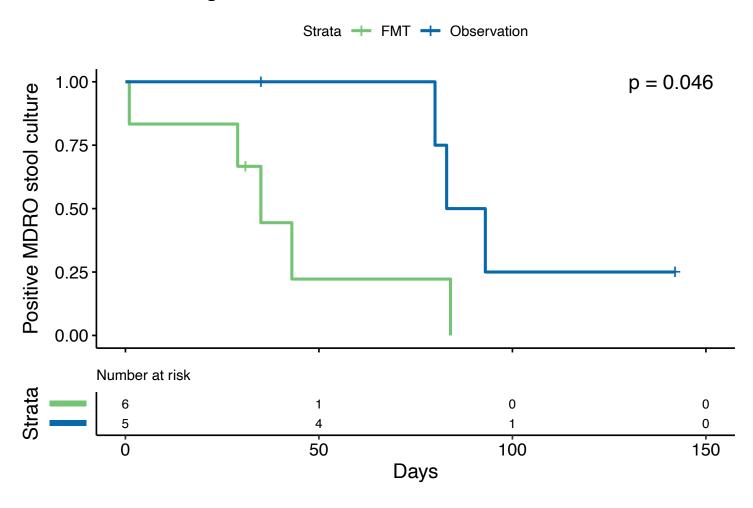
Intestinal microbial communities are well-established as critical to MDRO colonization resistance.

FMT-treated participants were more frequently MDRO negative at day 36



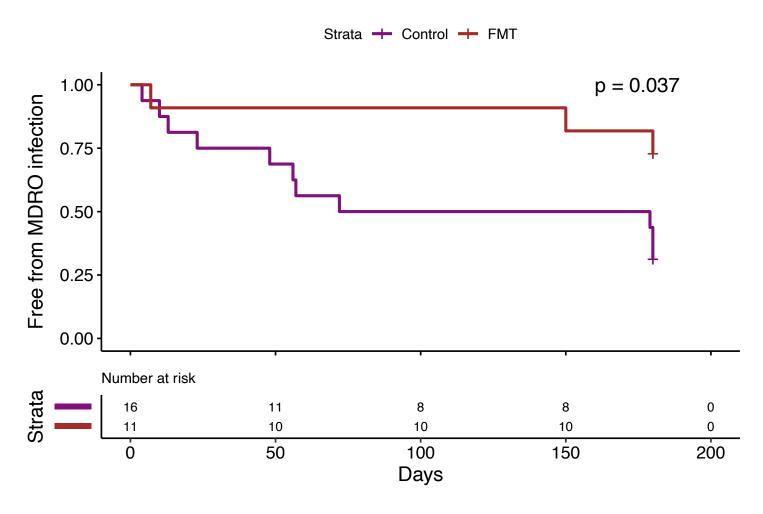
FMT-treated patients had shorter time to negative stool culture vs Observation

Time to negative MDRO stool culture

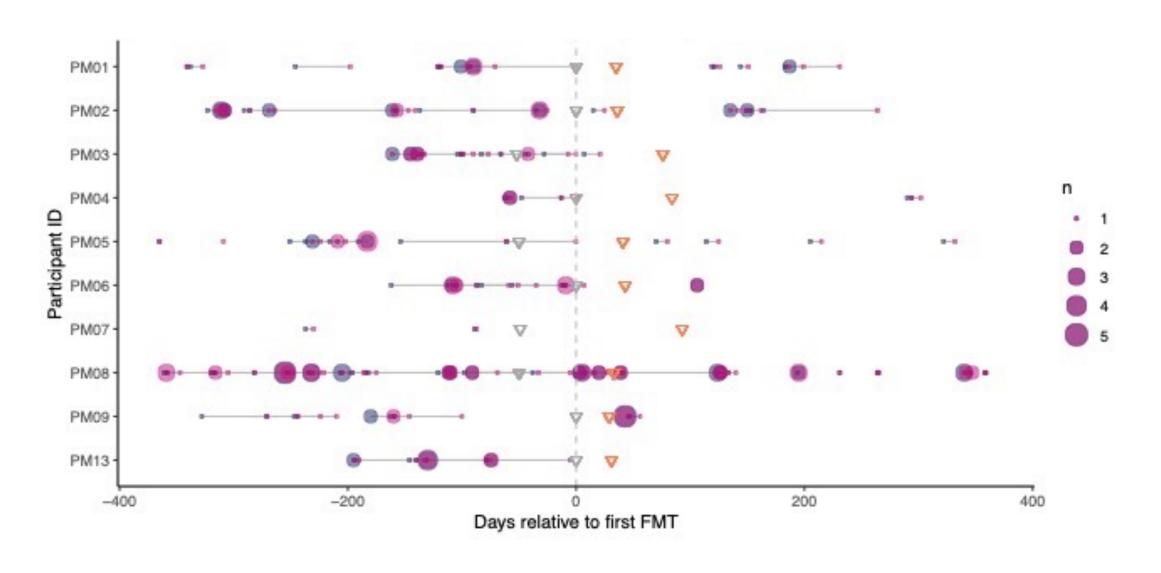


PREMIX participants had longer time to recurrent MDRO infection vs matched RTRs

Time to MDRO infection



FMT for MDRO Colonization Can Decrease Antibiotic Exposures and Hospitalization



Author, Year	Design	Number of Subjects	Primary Endpoint	Outcome
Bilinski, 2017	Open-label, prospective study	20 (Duodenal FMT)	Decolonization at one month	FMT: 15/20 (75%)
Dinh, 2018	Open-label, multi- center prospective study	16 (CRE colonized: 8 VRE colonized: 8)	Two or more consecutive rectal swabs at Days 7, 14, 21, 28, and monthly for three months	FMT for CRE: 4/8 (50%) FMT for VRE: 7/8 (87.5%)
Singh, 2018	Open-label, prospective study	15 (Duodenal FMT)	Decolonization at weeks 1, 2, and 4	FMT: 6/15 (40%)
Battipaglia, 2019	Open-label, retrospective study	10	Three or more consecutive negative MDRO rectal swab cultures	FMT: 7/10 (70%)
Huttner, 2019	Open-label, multi- center, randomized, controlled trial	16 (Oral Capsule) 6 (Nasogastric FMT) Control: 17	Negative MDRO stool culture at visit 4 (35-48 days after randomization)	FMT: 8/16 (50%) by per-protocol analysis Control: 3/13 (23%) by per-protocol analysis
Bar-Yoseph, 2020	Open-label, prospective study	15 (Oral Capsule FMT)	Negative perirectal MDRO culture x3	FMT: 9/15 (60%) negative at 1 month, 8/12 (67%) negative at 6 months
Seong, 2020	Open-label case series	35 (pooled colonoscopy, duodenoscopy, jejunostomy, or capsule)	Decolonization at one year	FMT: 24/35 (68.6%)



How can we accelerate the development of microbiome therapies for MDRO colonization?



Edward Jenner vaccinating a boy.
Oil painting by E.-E. Hillemacher, 1884.
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Angeline Mitchell, RN..., prepares shots of the Moderna COVID-19 vaccine. 2021. Public Domain, via Wikimedia Commons

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Prospective clinical studies of decolonization as an indication and primary endpoint

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Prospective clinical studies of decolonization as an indication and primary endpoint

Require data sharing and open science for microbiome trials

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