



Secret to a Healthy Liver Found in a Young Microbiome

Restoring the gut microbiome to a youthful state might reduce inflammation and prevent liver cancer.

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Bethesda, MD — Restoring the gut microbiome to its youthful state may hold the key to slowing aging and preventing liver cancer, one of the fastest-growing cancers worldwide, according to a study to be presented at [Digestive Disease Week \(DDW\) 2026](#).

Researchers collected fecal samples from eight young mice and transplanted them back into the same mice when they were older, a process called fecal microbiota transplantation, or FMT. The eight controls received sterilized fecal slurry, and a small group of similar young mice provided additional baseline data.

None of the mice with the restored microbiome developed liver cancer by the end of the study, while liver cancer was found in 2 out of 8 aging controls. The mice with the restored microbiome also saw reduced inflammation and less liver damage.

“We’re learning from this work that the aging microbiome actively contributes to liver dysfunction and cancer risk rather than simply reflecting the aging process,” said Qingjie Li, PhD, associate professor in the Division of Gastroenterology and Hepatology at The University of Texas Medical Branch, and lead researcher on the study. “The microbiome has a broader influence on the body’s cancer defenses than previously understood.”

At the conclusion of the in vivo study, the researchers conducted a comprehensive analysis of the liver tissue. They identified differences in MDM2, a gene already known to play a role in liver cancer. MDM2 protein levels were low in young mice, high in untreated older mice, and suppressed in treated older mice, making them more like young mice.

“Restoring a more youthful microbiome can reverse several core features of aging at both the molecular and functional level, including inflammation, fibrosis, mitochondrial decline, telomere attrition, and DNA damage,” Dr. Li said.

The research grew out of an earlier cardiac study, which found that microbiome changes could improve heart function. When analyzing tissues at the end of that study, the team noticed an even

more dramatic effect on the liver, which prompted deeper investigation.

Researchers used each mouse's own preserved microbiome rather than a donor's to minimize immune responses and infection risks and to create a cleaner proof-of-concept for eventual human trials.

Dr. Li emphasized that this is animal research, and the findings cannot be applied to humans, but he hopes to move toward first-in-human clinical trials in the near future.

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