



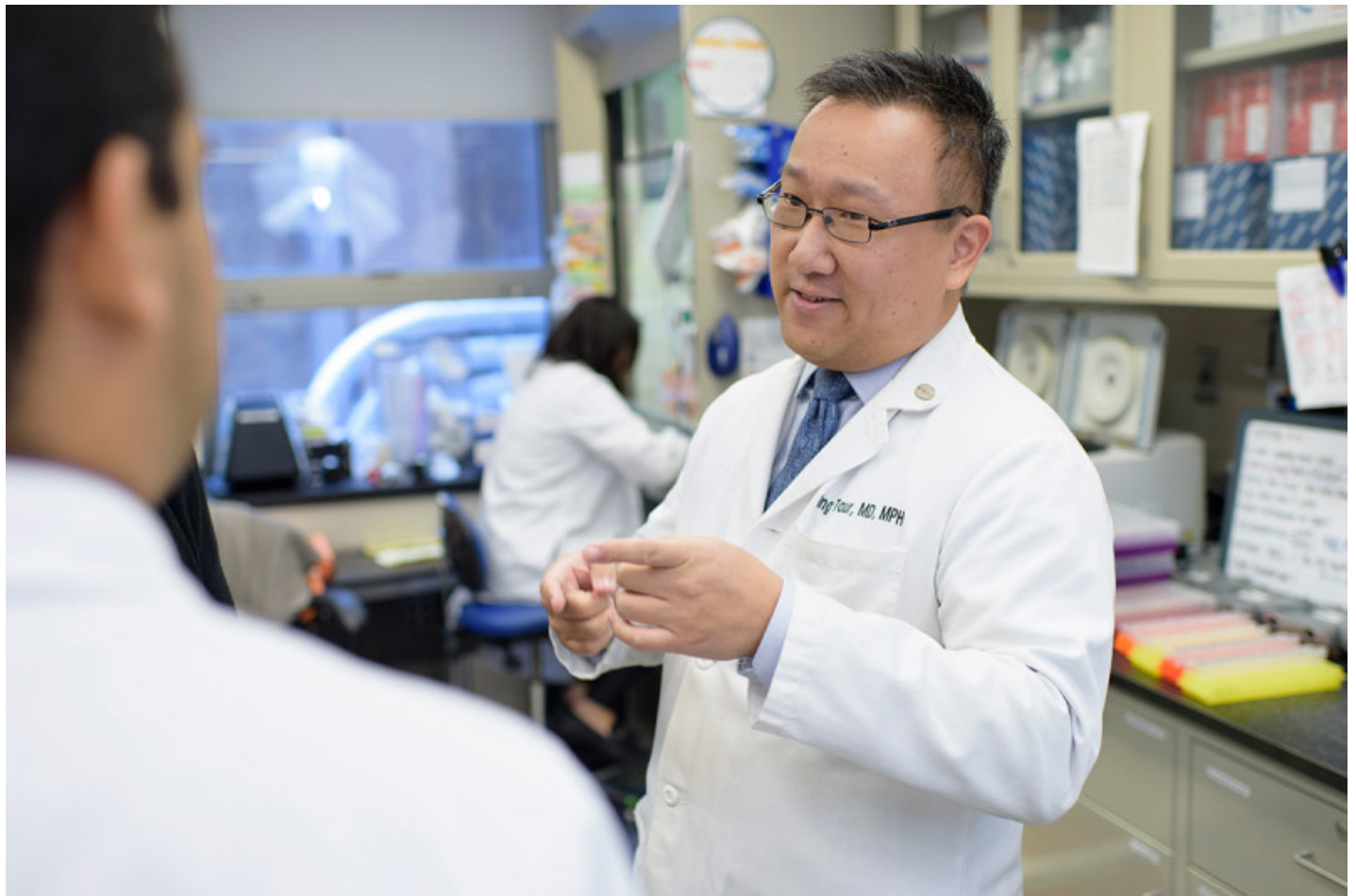
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Proof that Fecal Transplants Can Restore a Gut's Natural Balance of Microbes

By Julie Grisham, **Wednesday, September 26, 2018**



MSK infectious diseases specialist Ying Taur is leading research on fecal microbiota transplants.

Summary

A clinical trial at MSK is showing that fecal transplants are safe in people who have had stem cell or bone marrow transplants. The trial uses the participants' own stool for the transplant.

Fecal microbiota transplants (FMTs) are also known as stool transplants. The process involves collecting feces from a healthy donor, processing it, and then delivering it into the colon of the recipient. Just a decade ago, FMTs were unconventional. But they are becoming accepted by the medical establishment. The procedure is primarily used to treat intestinal infections from a bacterium called *Clostridium difficile* (*C. diff*), but it's being studied for other conditions as well.

FMTs are not formally approved by the US Food and Drug Administration. But in 2013, the FDA said that doctors could use them to treat chronic *C. diff* infections that have not responded to other treatments, opening the door for more controlled clinical studies.

A clinical trial at Memorial Sloan Kettering is now showing for the first time that FMTs can reestablish the health-promoting bacteria that are often lost in people who have [stem cell or bone marrow transplants](#) for blood cancer. The trial involves collecting and storing a person's own stool prior to the procedure. After the stem cell or bone marrow transplant, the FMT is given to the patient. Because the FMT comes from a person's own body, it is called an autologous FMT. The [results are being published today](#) in *Science Translational Medicine*.

"When we started this trial three years ago, we knew much less about FMTs than we know today," says MSK infectious diseases specialist [Ying Taur](#), the study's first author. "This study is really a milestone. It removes whatever trepidation there may have been about exploring this procedure in people who have recently undergone cancer treatment."

Addressing Serious Complications from Bone Marrow Transplant

People who have stem cell or bone marrow transplants to treat blood cancer face a number of challenges. These complications especially affect those whose transplanted blood cells come from a donor, called an [allogeneic transplant](#). In order for the body to accept the donor's cells, the recipient's own blood cells are wiped out with high doses of chemotherapy. During the time when the new blood cells are growing, recipients are prone to infections and require high doses of antibiotics. But those antibiotics can, in turn, destroy the healthy microorganisms that live in the body and allow more dangerous microbes to take over.

“This study ... removes whatever trepidation there may have been about exploring [fecal microbiota transplants] in people who have recently undergone cancer treatment.”



Ying Taur

infectious diseases specialist

This is where an FMT comes in: The procedure helps restore a balance of healthy bacteria in the gut.

In [earlier work](#), MSK physician-scientists Eric Pamer and [Marcel van den Brink](#) found that out-of-balance intestinal microbes can contribute to serious side effects. This disparity can affect outcomes after stem cell transplants. In particular, when harmful bacteria like *C. diff* dominate in the intestine, people are more likely to suffer complications from graft-versus-host disease. This potentially fatal side effect occurs when immune cells from the donor attack healthy tissues in the recipient, especially the intestinal lining. Dr. Pamer is one of the senior authors on the new paper; Dr. van den Brink is a coauthor.

Restoring the Balance of Microorganisms after Transplant

In the current study, participants' own fecal material is collected before beginning the stem cell transplant process. Using their own feces helps ensure that the transplant won't expose them to any unfamiliar flora. Any new bacteria could cause problems after the FMT. The collected stool is frozen to preserve the healthy microbe balance when the processed fecal material is reintroduced after the stem cell transplant.

The paper reports the results from the first 25 people in the study, 14 of whom received a transplant of their own fecal material and 11 controls, who did not.

The investigators looked at a number of measures. They considered levels of beneficial microbes as well as potentially harmful microbes. The mixture of microorganisms that came from the stored fecal material was able to reestablish itself after transplant. This resulted in more diverse, balanced microbiota.

“The important message here is that we showed we could bring the microbiota back to a level that was much closer to what people came in with before their stem cell transplant,” says Dr. Pamer, who heads a lab in the Sloan Kettering Institute’s Immunology Program.

Wide-Ranging Implications for the Health of People with Cancer

Another study from MSK researchers reported that having higher numbers of certain healthy bacteria in the intestinal tract contributed to fewer viral infections in the lungs after a stem cell transplant. Respiratory infections are another major complication in people who have stem cell transplants. This study points to the importance of maintaining healthy microbiota for overall recovery, not just for the health of the intestinal tract. The results were published online in April in the journal *Blood*.

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Eric G. Pamer
physician-scientist

Drs. Pamer and Taur say that since assembling the results in the current report, they have brought the total number of people in the FMT trial to 59. The MSK team is continuing to follow them, with the goal of determining whether autologous FMT can affect overall clinical outcomes and improve survival. They expect those results to be available next year.

Investigators plan to study using fecal material from healthy donors rather than a patient’s own stool for the transplant.

*The study’s other senior author is SKI computational biologist **Joao Xavier**. Other contributors to the research include **Sergio Giralte**, Chief of MSK’s **Adult Bone Marrow Transplant Service**, as well as other members of that service. This research is*

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