

## Interview with Dr. Susan Poutanen

UTMJ Interview Team (Kathleen Simms, Tatiana Yeuchy, and Imindu Liyanage)



Dr. Susan Poutanen

**D**r. Susan Poutanen is a pioneering microbiome researcher, microbiologist, and infectious disease physician. She is the co-principal investigator of the Microbiota Therapeutics Outcome Program – an interdisciplinary initiative which fosters multiple clinical and academic projects around the use of microbiota transplants. Her own diverse research encompasses gastrointestinal dysbiosis, antibiotic resistance, rapid diagnosis, and application of artificial intelligence.

Dr. Poutanen is graduate of the University of Toronto's Medical School, where she also completed her residencies in Internal Medicine and Medical Microbiology. She went on to complete an infectious disease fellowship at Stanford University and a Masters of Public Health, with an emphasis on Epidemiology, at the University of California at Berkley.

**UTMJ:** Thank you for sitting down with the university of Toronto Medical Journal. Before we get started, would you mind introducing yourself?

**SP:** I'm Susan Poutanen, medical microbiologist and an infectious disease physician here at the University Health Network, Sinai Health, Department of Microbiology; also affiliated with the University of Toronto, in the Laboratory Medicine and Pathobiology Department, and the Department of Medicine.

**UTMJ:** You're one of the co-principal investigators with the Microbiota Therapeutic Outcomes Program. Could you explain what this program is?

**SP:** We call it MTOP for short. It's a program that we initially developed with Dr. Susy Hota and myself as co-leads, initially for the care of patients with recurrent *C. difficile* infections. It was basically a program that we would be able to have both donors being able to provide samples of fresh fecal materials that we could then use to make fecal transplants for our patients with recurrent *C. diff.* We also recognized that there was a need and a research interest at the University of Toronto to also provide FMT

for other indications that were being investigated. So, we initially built it for our clinical needs, and then realized that expanding it to offer researchers other non-clinical needs would be helpful – so we went ahead and did that, and we ourselves are also pursuing other indications for FMT in our own research.

**UTMJ:** How does the research model of the Microbiota Therapeutics Outcome Program unique and, in your experience, why is this structure beneficial?

**SP:** For one, the infrastructure to set up a fecal matter transplant program is actually quite substantial, involving a number of different logistical elements. Just from an efficiency perspective, once there's a system set-up, it makes sense to make it a regional system to address multiple needs. But, the program that we have here at U of T is unique in that it really facilitates cross departmental interest in being able to utilize FMT as a potential resource. It's not just with regard to humans, we also create FMT for mice, for example. We are collaborating with a number of different investigators at U of T, some of which are immunologists looking at mice models of FMT benefits, others of which are looking at benefits of FMT for different clinical indications in humans, like bipolar disorder, obesity and metabolic syndrome and then our own interest, looking at potentially using it to eradicate carriage of antibiotic resistance organisms. So, it allows for that cross-fertilization across a lot of different disciplines, in different areas.

For our own interests, certainly as an infectious disease microbiologist – I haven't usually delved into psychiatry or endocrinology or hepatology, so it's very informative to work with other colleagues who are of a different primary interest. [...] And we're at a point now where we could argue that infectious disease spans into many disciplines, beyond the classic ID/microbiology.

**UTMJ:** Other researchers, and really the public at large, have increasingly demonstrated an interest in fecal microbiota transplant. Have you experienced any challenges in communicating with the public about this therapy, and if so, what misconceptions have you found you've come up against?

**SP:** It's interesting when you think about fecal transplants,

because we thought that our patients, being the first public that we interact with, would have been the first to have that ‘ick factor’; and yet, because of how sick our recurrent *C. difficile* patients are, we actually didn’t see that. We had patients asking for this before we could even provide it, and there was not an ‘ick factor’ whatsoever in their minds. They simply recognized the challenges of what they were living with in terms of recurrent symptoms, and so we didn’t see that so much.

In communicating to the public at large, it’s interesting because we had a volunteer with us who was a non-medical professional and she was just incredibly impressed with the use of something that she normally flushed down the drain [...] as a clinically useful therapeutic. She actually reached out to us, and her roommate happened to be someone in the public relations area and she was so interested that she ultimately uses us as a case for classes to really share with non-medical people. So again, there’s no ‘ick factor’ whatsoever. If anything, there’s an interest to help and promote the knowledge of MTOP, and to help get more donors to help support the program.

I think when folks initially think about it, there may be an early thought that this should be something that’s not looked upon very highly, but in fact there seems to be a real acceptance. I think that part of it maybe that with social media - there’s a whole lot more dialog and interplay between the medical community and the public. There’s a large interest, as well, looking at natural therapeutics, and this certainly falls into that, so I think there’s a different acceptance nowadays than perhaps 20 - 25 years ago.

**UTMJ:** The World Health Organization highlights that Antibiotic Resistance is a growing health concern. How do treatment strategies, such as those provided by MTOP, provide an alternative to antimicrobials?

**SP:** It’s definitely an ongoing concern and looking for alternate therapeutics is where a lot of folks are going to, because of this ongoing battle of creating a new drug, and having resistance, and this whole chicken-egg challenge. What’s certainly beneficial about fecal transplant is that there’s

the potential that it can be utilized to eradicate resistance and carriage of resistant organisms. We haven’t necessarily had definite studies, but if that were to be shown that it’s beneficial, then you have a non-therapeutic means of essentially replacing one’s microbiota with a resistant form. So, you have the potential to avoid antimicrobials. [...] It’s a potential game changer all together, in terms of really changing one’s microbiota, so we don’t have the same concerns of resistance, or resistant infections – but, we’re not quite there yet. I think there’s a lot more work that needs to be done, but it’s certainly promising.

**UTMJ:** Interest in research in the microbiome has been growing exponentially, so in what directions do you foresee this field heading in?

**SP:** You’re completely right, it’s really going into all different disciplines. At this point, I think we’re still exploring all the different areas where there are purported associations, and I, right now, see it continuing to expand into different fields. I don’t see it limiting just yet. Certainly, we’re just getting data from some of the original mouse and human studies that are ongoing. We’ll have a better understanding if this is more hype and hope than reality. I don’t think we have the definite data just yet to really say that this is all hype, and there isn’t really data about which way to go just yet, so I suspect that it will continue to expand. We’re seeing it now in GI, hepatology, we’re seeing it in endocrinology, in psychiatry, in infectious diseases and there’s a lot of discussion with regard to cardiovascular disease as well as autoimmune disease - it can go on and on and on. At this point, I think it’s still very much open to all disciplines to explore.

**UTMJ:** That concludes our questions. We wanted to say thank you for sitting down with us. As medical students, we’re excited about the field of the microbiome and learning from an expert such as yourself.

**SP:** It’s my pleasure.