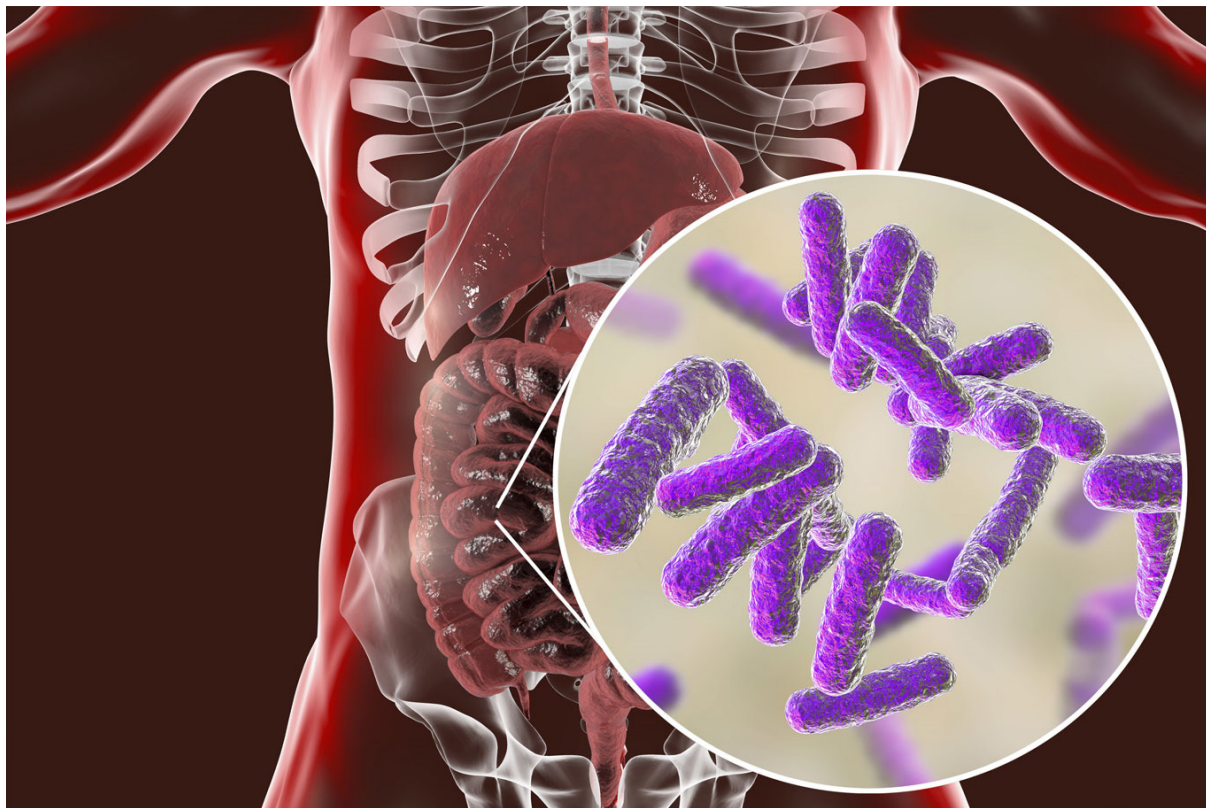


Gut check

January 23, 2019 | By [Carol Marie Cropper](#) [[javascript:void\(0\)](#)]



Researchers who study the intestinal bacteria that help humans digest food – and make them sick when things go wrong – will soon have a new campus resource to bolster their explorations.

The [Microbiome Research Laboratory](http://www.utsouthwestern.edu/labs/microbiome/) (MRL) opens this month. The new facility will be based in the Department of Immunology and housed in UT Southwestern’s BioCenter on Inwood Road.

“The goal of the MRL is to serve as a core facility that will support basic and translational researchers who wish to use microbial metagenomics in their research activities,” says [Dr. Prithvi Raj](#)



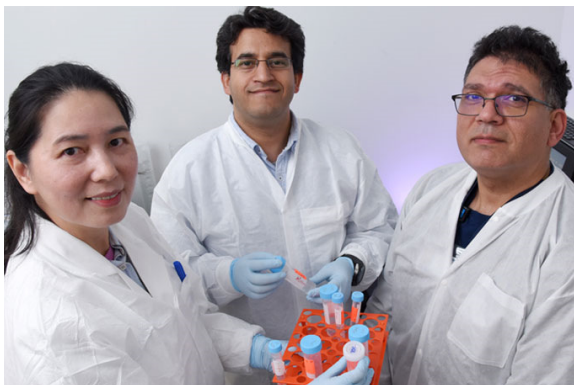
UT Southwestern's BioCenter

[<https://profiles.utsouthwestern.edu/profile/116973/prithvi-raj.html>], an Assistant Professor of Immunology and the Microbiome Research Lab's founding Director. Recent advances in genetic sequencing technology have made it possible to study the composition of all microbial communities strictly on the basis of their genetic material, a strategy called microbial metagenomics.

Dr. Raj received his doctorate from Jiwaji University in Gwalior, India, and conducted postdoctoral research in the laboratory of [Dr. Edward Wakeland](#)

[<https://profiles.utsouthwestern.edu/profile/36900/ward-wakeland.html>], Professor of Immunology and holder of the Edwin L. Cox Distinguished Chair in Immunology and Genetics at UT Southwestern.

In his postdoctoral research in the Wakeland lab, Dr. Raj investigated the genetic basis of systemic lupus erythematosus (SLE) in a landmark international study based at UTSW. The study demonstrated the potential of precision medicine by using next-generation DNA sequencing technology to identify more than 1,000 gene variants that affect susceptibility to SLE. In addition to SLE, Dr. Raj has also contributed his expertise in next-generation sequencing and genomics to investigate genetic changes in bacteria such as *Klebsiella pneumoniae*, *Mycobacterium tuberculosis*, and *Staphylococcus aureus*, which cause infectious diseases in human populations.



Members of the Microbiome Research Laboratory
(l-r): Bo Zhang, Director Dr. Prithvi Raj, and Carlos
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Interest in the microbiome – the trillions of microorganisms that live in and on the human body – has exploded in recent years. The MRL will help UT Southwestern researchers work in the area, says [Dr. Sebastian Winter](#)

[<https://profiles.utsouthwestern.edu/profile/145500/sebastian-winter.html>], an Assistant Professor of Microbiology and a W.W. Caruth, Jr. Scholar in Biomedical Research, who studies microbial imbalances in the intestines.

He says the intestines are teeming with numerous microbes, likely exceeding 500 different species. “We now understand that microbes may contribute to many noninfectious diseases, such as inflammatory bowel disease and heart disease.”

However, many bacteria that live in the human body are difficult to culture, either because they require highly specialized conditions that are difficult to replicate in the laboratory or because their nutritional requirements are not fully understood, Dr. Raj says.

“The advantage to the metagenomics approach is that it allows identification of virtually all microorganisms, regardless of whether we know how to culture them or not,” he adds.

“Having access to microbial metagenomics on our campus will be enormously enabling for the research efforts of many UT Southwestern scientists and clinicians,” says [Dr. Lora Hooper](https://profiles.utsouthwestern.edu/profile/60931/lora-hooper.html) [<https://profiles.utsouthwestern.edu/profile/60931/lora-hooper.html>], Professor and Chair of the Department of Immunology. Her lab uses mice to study how the microbiome of the gut contributes to inflammatory diseases and obesity.



Dr. Lora Hooper

“Ready access to this technology will empower us to make fundamental discoveries about how the gut microbiome contributes to our health and how it promotes diseases such as obesity and cancer,” says Dr. Hooper, who holds the Jonathan W. Uhr, M.D. Distinguished Chair in Immunology and is a Nancy Cain and Jeffrey A. Marcus Scholar in Medical Research, in Honor of Dr. Bill S. Vowell.

“It will be transformative to have this capability on campus,” adds [Dr. Vanessa Sperandio](https://profiles.utsouthwestern.edu/profile/50556/vanessa-sperandio.html) [<https://profiles.utsouthwestern.edu/profile/50556/vanessa-sperandio.html>], a Professor of Microbiology and Biochemistry who studies enterohemorrhagic *Escherichia coli*, a bacteria that causes bloody diarrhea and can be fatal.

Currently, UT Southwestern researchers ship their samples of bacterial DNA and RNA to outside labs, then wait to learn the types and prevalence of bacteria species, which are found by identifying (sequencing) bacterial genomes in the sample. Once the new UTSW lab opens, researchers will be able to drop off their samples at the MRL for advanced genome sequencing and analysis at a competitive cost, Dr. Raj says.

The [MRL website](http://www.utsouthwestern.edu/labs/microbiome/) [<http://www.utsouthwestern.edu/labs/microbiome/>] explains the services offered and will soon make it possible for researchers to place their orders and arrange for direct payment from their laboratory accounts via the University’s iLab portal.

While the MRL will initially provide services for basic and translational researchers, Dr. Raj hopes to expand into the clinical realm in the future.

“My ultimate goal is to provide cutting-edge technology that enables fundamental discoveries by our basic and translational investigators and also to serve our patient population,” he says.

The lab is already doing limited projects using a MiSeqDx sequencer. The sequencer is specifically designed for microbial genomics and allows determination of the identity and abundance of a given bacterial species, Dr. Raj says.

Within a few months of opening, Dr. Raj expects to add the capability to do so-called “shotgun metagenomic sequencing” in order to provide comprehensive sequencing to identify all bacterial genomes within a sample.

“In addition, the MRL will provide customer services for DNA/RNA extraction from a variety of biological samples to aid laboratories that lack that capability,” he adds.

The facility will also provide fee-based services to labs outside the University. “This service will be particularly useful when our researchers collaborate with those at other research institutions,” he says.

Tags : [In Pursuit](#), [\[/research/in-pursuit/ \]](#) Core Competencies

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