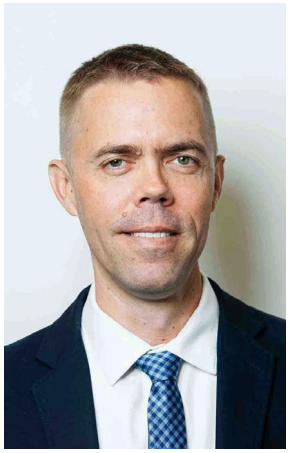
Duke Microbiome Center

December 2025 DMC Newsletter

This quarterly newsletter is provided by the Duke Microbiome Center (DMC) to inform the Duke University community about activities, resources, news, funding and educational opportunities, and recent highlights in the microbiome sciences at Duke and beyond. To suggest items for this newsletter or to add someone to our newsletter listserv, please email Cindy Wicker. For further information on the DMC, please visit the DMC website.

In this newsletter:

A Message from the Director:



Dear DMC Community,

As we approach the end of 2025, I want to acknowledge the uncertainty and stress many of you have experienced this year due to new challenges across the federal research funding landscape. These challenges touch not only our science, but our trainees, teams, and long-term plans. Yet moments like this also remind us of the strength of our community. The Duke Microbiome Center has always thrived because of its deep connections - across disciplines, across schools, and across stages of training - and those connections matter now more than ever. From my perspective as center director, I am continually inspired by your resilience, creativity, and generosity with one another. Please know that you are not navigating this alone. As a center and and an institution, we will support each other, share resources, and advocate together as we move forward. As always, if you have ideas on how the DMC can further support your work, please contact me or anyone else on the leadership team.

As you will see in the articles and links below, our DMC community continues to make important impacts at the local, national, and international levels, and our destination and mission as a scientific community remain unchanged. For up-to-date information and guidance on navigating the continuing developments and directives from the federal government, please go to https://myresearchpath.duke.edu/updates-navigating-recent-executive-orders.

Sincerely,
John Rawls
Director, Duke Microbiome Center

Resource Showcase

- **DMC Red Team Review**

We invite you to take advantage of DMC Red Team Review service for faculty members of the DMC. Our goal is to provide a formal service for giving conceptual feedback (that is, not proofreading) to help hone your latest grant applications to NIH, NSF, etc. For additional information visit the DMC Webpage.

To allow investigators more time to prepare their proposals for review, we are exploring more flexible submission deadlines for grant review.

To give reviewers and you enough time to capitalize on the process, we require an SPS record and internal grant deadline from your department - and the recommended deadline for documents to be reviewed is 6-weeks prior to this date, with an expected turnaround within 2 weeks. For shorter review timelines, review is possible but may result in a less detailed review process. Suggested reviewers (we will aim for 2 reviewers per grant) are also requested. Submissions are through Google Forms.

If you are interested in being a reviewer (small stipend provided), or have additional questions, please contact Julia.Oh@duke.edu and cc Cynthia.Wicker@duke.edu

- **DMC Microbiome Office Hours Continue**

Open to anyone within the DMC community – at any background level.

Given the popularity and success of office hours, we have decided to keep the office open for the foreseeable future. No need to schedule ahead of time - everyone is welcome to just stop in!

This recurring event is designed to provide real-time assistance with any aspect of ongoing or upcoming microbiome research projects.

Topic experts in bioinformatics, biostatistics, microbiology, and general microbiome-science will be in attendance each week, so feel free to bring any questions/problems that you have.

Event Location: MSRB3 Conference Room 4122
Event Time: First and Third Friday of each month - 1:30pm – 2:30pm

Scheduling changes will go out to the Microbiome Center email list, and will be posted on the DMC Website and in the Bioinformatics/Biostatistics working group.

For more info, or any questions regarding office hours, please contact jason.arnold@duke.edu.

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Community Events

- **The Breakfast Club Continues**

We are excited to continue the "The Breakfast Club" 2025-2026 - a monthly community building forum every 4th Monday morning of the month with light breakfast and coffee.
WHO: This forum is jointly sponsored by the Department of Integrative Immunobiology (IIB), Department of Molecular Genetics and Microbiology (MGM), Center for Virology and Duke Microbiome Center (DMC). Students, postdocs, staff, and faculty in any laboratory affiliated with DMC, Center for Virologyl, MGM, or IIB are invited.

WHEN: Every 4th Monday morning of the month from 8:30-10:00AM

WHERE: MSRB1 room 001 Atrium

WHAT: Free coffee and light breakfast (while supplies last) in a flexible and informal space for community building.

WHY: We seek to build community across IIB, MGM, Center for Virology, and DMC. In addition to informal conversation, attendees are invited to use The Breakfast Club to hold any kind of small group activity (e.g., small group meetings, journal clubs, office hours, practice chalk talks.

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DMC 2025-2026 Research-In-Progress Series

The DMC Research-in-Progress Series highlights ongoing research in the Duke Microbiome Center.

These informal seminars take place on the Third Friday of each month
12:00pm and 1:00pm in MSRB3 – Room 1125.

Pizza will be served!

Zoom link is available here for those who cannot attend in person.

See this month's event here

If you are interested in presenting, or want to see our tentative presenter list, please check the scheduling calendar.

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Upcoming DMC Meetings

- **DMC seminar** on Wednesday December 10 at 2pm in MSRB3 Room 1125 given by **Daniel Sprockett, PhD** from the Wake Forest School of Medicine titled **"Ancient Partnerships, Modern Insights: Tracing the Assembly, Transmission, and Evolution of Mammalian Gut Microbiomes."** Learn more about Dr. Sprockett's research here.
- The next Faculty meeting will be Monday, February 23, 2026 at 1:00 PM in-person in 4122 MSRB3 with a Zoom option. **DMC Quarterly Faculty Meetings:**

Please mark your calendars!

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Upcoming Microbiome Conferences

Gordon Research Conference - A New Path Forward - Exploring the Potential of Microbiome Editing: Pomona, California, U.S. 11-16 January 2026.

Keystone Joint Conference on Human Microbiome: From Models and Mechanism to Medicine **and Human** Microbiome: From Models and Mechanism to Medicine: Fairmont Banff Springs, Banff, AB, Canada, Jan 19–22, 2026.

Microbes in Microbiomes Conference: Kovens Conference Center, Florida International University, Miami, Florida, U.S. 18–20 February 2026.

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New Member Spotlights!

Sara E. Lipshutz
Assistant Professor of Biology

Sara joined faculty ranks at Duke University in 2023 and has built a research program focused on studying behavioral evolution in songbirds and shorebirds - using highly integrative approaches including population genomics, transcriptomics, neuroendocrinology, and field ornithology to expand our understanding of diversity in animal behavior. More recently, Sara's lab has taken on studies to explore the impacts of environmental stimuli on gut microbiota - and in turn, how those microbiota modifications may impact animal behavior.

Please join us in welcoming Sara to the Duke Microbiome Center community, and check out some of the exciting research her lab is working on!

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News & Awards

Nominate a colleague for Duke Microbiome Center's "Keystone Award"

Nominations are now open for the annual DMC's Keystone Award which is designed to recognize individuals within DMC laboratories that have made significant advances towards demonstrated outstanding leadership, initiative, and engagement in fostering an inclusive and collaborative research environment—whether through research, mentorship, team-building, outreach, or efforts that expand participation in microbiome research. Nominees should have contributed to one or more of the ends stated above, and thereby advancing diversity, equity, and/or inclusion. For more information about this award and previous awardees, go here.

- ***Application deadline:*** 5:00PM EST on Friday, January 9th, 2026
- ***Eligibility of nominee:*** Any student, fellow, faculty, or staff employed at Duke University in a DMC laboratory for at least 6 months prior to the nomination deadline.
- ***Eligibility of nominator:*** Any student, fellow, faculty, or staff at Duke University. The nominator does not necessarily need to be affiliated with the DMC. Self-nominations are not permitted.
- ***Nomination package contents:***
    - Nomination letter (2 pages max) written by the nominator describing the specific ways the nominee has contributed to the ends above;
    - Letter of support (2 pages max) written by someone other than the nominator. This referee does not necessarily need to be employed at Duke University or affiliated with the DMC;
    - The nominee's full CV.

Nomination packages should be emailed to Cindy Wicker by the January 9th deadline above. Please consider nominating a deserving colleague for this important award this year. Please forward this message to others to help spread the word.

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A Sweet Discovery to Fight Obesity

Researchers at the Duke University School of Medicine and Duke Microbiome Center have discovered a special sugar molecule that helps mice lose weight quickly and safely. When taken by mouth, the sugar starts working within a day or two, and the weight loss continues for nearly three weeks after just one dose.

It targets visceral fat, the harmful fat that accumulates in the abdominal cavity and wraps around organs such as the liver and intestines. This kind of fat is linked to serious health problems like diabetes, heart

disease and stroke, according to assistant professor of pediatrics Dr. Neeraj (Neil) Surana, the principal investigator and project lead.

Unlike popular GLP-1 receptor agonist type drugs such as Ozempic and Wegovy, which cause people to lose fat and muscle all over the body, this one only reduces visceral fat. Muscle mass and subcutaneous fat, which can be healthy, remain untouched.

While other drugs work by inhibiting one's appetite, this works by speeding up how fast the body burns fat and creates more heat, like turning up the body's internal furnace.

It's a positive step, although it's not a magic bullet, says Surana. If someone stops taking it, their metabolism will return to normal, and weight could come back unless they also make lifestyle changes like exercising more or eating differently, explains Surana. That's why researchers expect it would need to be taken regularly, like a daily pill.

So far, mice haven't shown any changes associated with the unpleasant side effects that often come with Ozempic and Wegovy, such as nausea or vomiting. And based on how the sugar works, scientists don't expect those problems in humans either.

The team has finished most of the early lab work and is now preparing to manufacture the sugar in larger amounts. They're working toward filing an Investigational New Drug application so they can begin human trials. To move faster, they're looking for funding to spin the research into a company.

If successful, this sugar could become a safer, more targeted way to treat obesity. Read the whole article here

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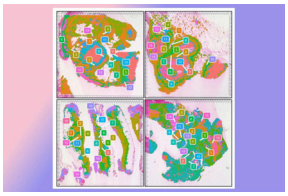
Inside TB's Hidden Cities



Tuberculosis (TB) infects more than 10 million people each year worldwide, causing 1.25 million deaths. In 2025, the disease made a troubling comeback in the United States, including a rise in cases in North Carolina for the first time in decades.

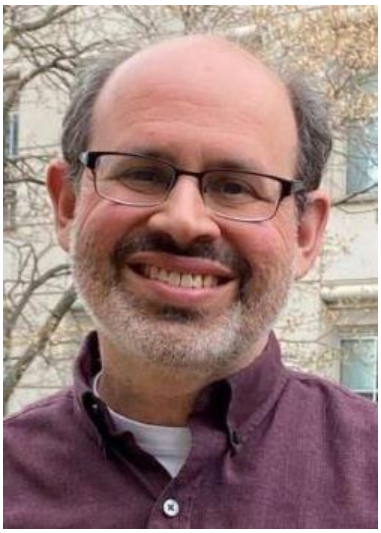
In some people with the disease, clusters of immune cells called granulomas form inside the lungs. These microscopic "cities" can harbor the bacterium that causes TB, allowing it to persist and resist antibiotics.

Now researchers at Duke University School of Medicine have used advanced genetic sequencing tools to show the identity of all the "residents" of these cellular cities, pinpointing their exact locations and how they interact.

The map revealed that a particular protein, osteopontin, plays a crucial role in building granulomas. And the study offers a rich dataset that could pave the way for new treatments.

The results were published online in the journal mBio.

"The osteopontin finding is an example of the power of these data to reveal how granulomas function," said David Tobin, PhD, professor of molecular genetics and microbiology and senior author of the study. "And it wouldn't have



been possible without a team of Duke collaborators."

Granulomas can be "both a prison and a penthouse," for the TB bacterium, said first author Charlie Pyle, PhD, PharmD, a senior research associate. They trap the bacteria and stop it from spreading, but they can also block immune cells and antibiotics from reaching and killing the infection. You can read more of this interesting article here.

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Newly Discovered 'Sixth Sense' Links Gut Microbes to the Brain in Real Time

In a breakthrough that redefines our understanding of gut-brain communication, researchers have uncovered a "neurobiotic sense," a newly identified system that lets the brain respond in real time to signals from microbes living in our gut. The new research, led by neurobiologists Diego Bohórquez, PhD, and M. Maya Kaelberer, PhD in the Duke University School of Medicine and Duke Microbiome Center, and published in Nature, centers on neuropods, tiny sensor cells in the lining of the colon. These cells detect a common microbial protein and send rapid messages to the brain that can help curb appetite and guide decision-making.

But this is just the beginning. The team believes this neurobiotic sense may be a broader platform for understanding how the gut detects microbes influencing everything from eating habits to mood — and even how the brain might shape the microbiome in return.

"We were curious whether the body could sense microbial patterns in real time and not just as an immune or inflammatory response, but as a neural response that guides behavior in real time," said Bohórquez, an associate professor of medicine and neurobiology and senior author of the study.

The key player is flagellin, an ancient protein found in bacterial flagella, a tail-like structure that bacteria use to swim. When we eat, some gut bacteria release flagellin. Neuropods detect it, with help from a receptor called TLR5, and fire off a message through the vagus nerve a major line of communication between the gut and the brain.

The team, supported by the National Institutes of Health, proposed a bold idea: that the protein from gut bacteria could trigger neuropods to send an appetite-suppressing signal to the brain—a direct microbial influence on behavior. The researchers tested this by fasting mice overnight, then giving them a small dose of flagellin directly to the colon. Those mice ate less.

When researchers tried the same experiment in mice missing the TLR5 receptor, nothing changed. The mice kept eating and gained weight, a clue that the pathway helps regulate appetite. The findings suggest that flagellin send a "We've had enough" signal through TLR5, allowing the gut to tell the brain it's time to stop eating. Without that receptor, the message doesn't get through.

The discovery was guided by lead study authors Winston Liu, MD, PhD, and Emily Alway, both graduate students of the Duke Medical Scientist Training Program and postdoctoral fellow Naama Reicher, PhD.

Their experiments showed that disrupting the pathway changed how much mice ate. That finding pointed to a deeper link between gut microbes and behavior than once thought.

“Looking ahead, I think this work will be especially helpful for the broader scientific community to explain how our behavior is influenced by microbes,” said Bohórquez. “One clear next step is to investigate how specific diets change the microbial landscape in the gut. That could be a key piece of the puzzle in conditions like obesity or psychiatric disorders.” You can read more of this interesting article here.

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PreMiEr Industry & Advisory Summit explores microbiome technologies in the built environment

Over two days in late November, the NSF Engineering Research Center for Precision Microbiome Engineering (PreMiEr) had the privilege of bringing together an incredible community of scientists, innovators, and regulators - all passionate about shaping the future of microbiome technologies in the built environment (MoBE).

The conversations at this PreMiEr Industry and Advisory Summit were electric — from how we validate emerging technologies to how we build trust through data, standards, and transparency. What struck me most was the shared sense of purpose: we’re not just advancing science, we’re shaping healthier spaces for people everywhere.

PreMiEr is a National Science Foundation (NSF)-funded Engineering Research Center (ERC) headquartered at Duke University in Durham, North Carolina, USA. Other partners include North Carolina Agricultural and Technical State University (NC A&T), North Carolina State University (NCSU), the University of North Carolina at Chapel Hill (UNC-CH), and the University of North Carolina at Charlotte (UNC-C).

In addition to academic researchers from Duke, UNC-CH, NCSU, UNC-C, and NC A&T, this summit included PreMiEr's partners from US EPA, PS&S, International WELL Building Institute (IWBI), Novonesis, Neogen Corporation, BioScope Innovations, PacBio, Illumina, North Carolina Biotechnology Center (NC Biotech), and the North Carolina Department of Commerce. To learn more about PreMiEr, see their homepage.

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Funding Opportunities through the DMC

DMC Rolling Voucher Program:

Duke University has established shared resources that avail diverse technologies to Duke investigators that can be used to advance microbiome science. To facilitate Duke Microbiome Center investigators' access to these shared resources, particularly for microbiome projects that are not yet externally funded, we are pleased to announce the Duke Microbiome Center Rolling Voucher Program. This rolling voucher program offers vouchers in amounts ranging up to $10,000. Each DMC faculty member cannot receive more than $10,000 of funds through this mechanism within any two year period. These vouchers are redeemable at any of the Duke University School of Medicine’s many core facilities, and applicants are required to contact the directors of these shared resources to develop project budgets. Learn more here.

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Highlighted Microbiome Funding Opportunities

- Funding Opportunity Announcement for Impact of Environmental Exposures on Gut-Brain Signaling in Neurological Conditions (R01) https://researchfunding.duke.edu/funding-opportunity-announcement-impact-environmental-exposures-gut-brain-signaling-neurological
- AHRQ -- Large Research Projects for Combating Antibiotic-Resistant Bacteria (CARB) (R01, R18) https://researchfunding.duke.edu/ahrq-large-research-projects-combating-antibiotic-resistant-bacteria-carb-r01-r18
- Notice of Special Interest (NOSI): Leveraging Microbial Exposure for Improving Mouse Models of Human Immunity https://researchfunding.duke.edu/notice-special-interest-nosi-leveraging-microbial-exposure-improving-mouse-models-human-immunity
- NARMS Cooperative Agreement Program to Strengthen Antibiotic Resistance Surveillance in Retail Food Specimens (U01) Clinical Trials Not Allowed https://researchfunding.duke.edu/narms-cooperative-agreement-program-strengthen-antibiotic-resistance-surveillance-retail-food

See additional Microbiome Funding Opportunities here.

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Highlights of Recent DMC Publications

Names of primary DMC faculty authors are bolded

- Liu, W. W., Reicher, N., Alway, E., Rupprecht, L. E., Weng, P., Schaefgen, C., **Rawls,J.F.**,… **Bohórquez, D. V.** (2025). A gut sense for a microbial pattern regulates feeding. Nature, 645(8081), 729–736. https://doi.org/10.1038/s41586-025-09301-7
- Rodrigo, M., **Chumpitazi, B. P**., Chiappini, E. A., Brown, M. L., Wicker Velez, S., & Kutty, S. (2025). Characterization of Multidisciplinary Programs for Abdominal Pain-Related Disorders of Gut-Brain Interaction. Clinical Pediatrics, 64(8), 1066–1073. https://doi.org/10.1177/00099228251316367
- Musaazi, I. G., Liu, L., Shaw, A., Zaniolo, M., Stadler, L. B., & **Delgado Vela, J.** (2025). Optimizing models for the prediction of one step ahead extreme flows to wastewater treatment plants using different synthetic sampling methods. Journal of Environmental Management, 392, 126592. https://doi.org/10.1016/j.jenvman.2025.126592
- **Vilgalys, R.J**.,Vietorisz, C. R., Nash, J. A., Siggers, J. A., Leander, E. J., Bock, B. M., Camuy-Vélez, L. A., … Hoeksema, J. D. (2025). Pine-fungal co-invasion alters whole-ecosystem properties of a native eucalypt forest. The New Phytologist, 247(5), 2342–2356. https://doi.org/10.1111/nph.70363

See additional DMC publications here.

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Job Listings

Tufts University in Boston:

An exciting postdoctoral training program that is in place at Tufts University in Boston, Massachusetts, and **hope that you will pass information about this opportunity on to your graduate students & early postdocs.** This program, called Tufts IRACDA (*Institutional Research and Academic Career Development Awards Program*), is funded by NIH-NIGMS. **NIH funding for this program has recently been reinstated. While the long-term commitment from the NIH remains uncertain, we are dedicated to supporting Scholars through this program for as long as we are able. Mentors and applicants should be aware of the possibility that funding may be once again terminated by the NIH.**

Tufts IRACDA prepares talented young scientists for the multiple demands of an academic career in biomedical research. Scholars spend on average 75% of their time conducting bench research and 25% of their time in career development activities. Key features that make our program attractive to postdocs are:

In this 4-year program, the first year is funded by the research mentor with Years 2-4 funded by the NIGMS IRACDA grant. For these latter three grant-funded years, we provide salaries of 77k and up! The exact level is determined by mentor funding capacity in &ear 1 and years of postdoctoral experience."

- Outstanding research opportunities in cell and developmental biology, genetics, molecular biology, microbiology, immunology, neuroscience, biomedical engineering, chemical biology and nutrition.
- Development of teaching skills through mentored classroom assignments at minority-serving institutions in the Boston area and workshops on teaching methods that encourage active learning.
- Workshops on essential skills such as grant and manuscript writing, mentoring, lab management, and scientific presentations as well as coaching throughout the job search process.

- A tight-knit community of postdocs interested in academic careers plus opportunities to network with scholars in the 20 other IRACDA programs across the nation.
- Successful job searches: We have placed 48 of our 54 alumni (89%) at institutions of higher education across the country, with 85% of these being tenure-track positions.
- Campus locations in the Boston metropolitan area, a hub of biomedical research in academia and industry as well as a city rich in culture, sports and access to outdoor activities and extensive public transportation.

The application deadline for positions beginning in the fall of 2026 is March 15, 2026. Later applications will be considered if positions are available. Applicants must be U.S. citizens or permanent residents with no more than two years of postdoctoral training at the time of their appointment to the program. We are looking for scholars who are passionate about research, want to develop skills critical for an academic research career and to gain experience with innovative teaching practices, and are committed to increasing diversity in the academic environment.

For additional information on the Tufts IRACDA program and application procedures, please visit our **website**, or contact us with questions.

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