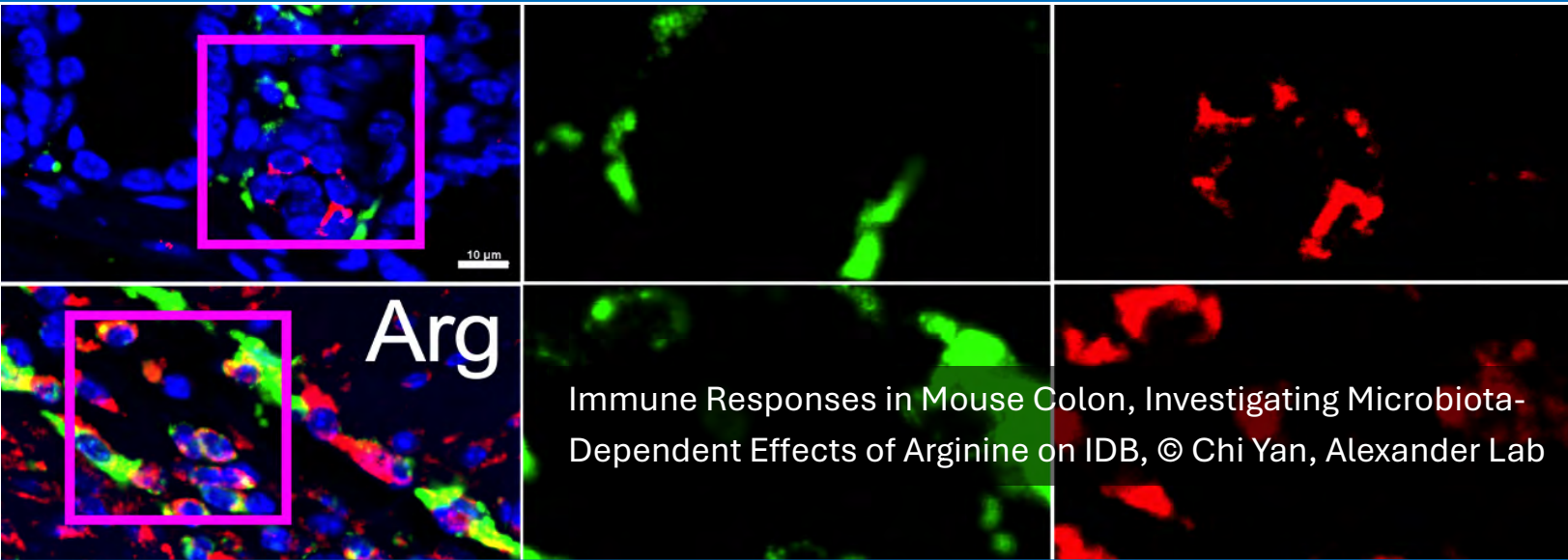
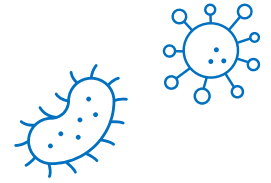


MMI NEWS



Immune Responses in Mouse Colon, Investigating Microbiota-Dependent Effects of Arginine on IDB, © Chi Yan, Alexander Lab

Welcome to a new academic year in MMI! As we begin another year together, we're excited to welcome back our faculty, staff, students to celebrate all that makes this community so vibrant. From new ideas and collaborations to research breakthroughs, teaching accomplishments, and the many ways our students and colleagues are making an impact, there is plenty to be proud of. This issue of *MMI News* highlights some of our recent work and achievements while looking ahead to the opportunities, discoveries, and connections still to come.

Here's to a great year ahead!

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Dr. David Andes Inducted as 2026 Wisconsin Academy of Sciences, Arts & Letters Fellow

By: Allison Bauer | Dept. of MMI

The Wisconsin Academy announced sixteen Wisconsinites who have demonstrated a lifelong commitment to intellectual discourse and public service to receive the 2026 Fellows Awards. The Wisconsin Academy Fellows Award recognizes educators, researchers, mentors, artists, and civic or business leaders from across Wisconsin who have made significant accomplishments in their fields and substantial contributions to the cultural life and welfare of the state and its people. Fellows are selected by committee through a rigorous process every two years. Being selected as a Fellow offers unique recognition across diverse fields and amplifies the extraordinary work of Wisconsinites.

“When we are looking for inspiration and a vision for what is possible, the Wisconsin Academy Fellows program serves as a light, showcasing bright minds and creative voices from every corner of our state,” says Wisconsin Academy Executive Director Erika Monroe-Kane. “Academy Fellows are groundbreakers who have had a deep, meaningful impact and significantly contribute to a vibrant and brilliant Wisconsin. Reflecting the extraordinary in Wisconsin, this 2026 Wisconsin Fellows Class connects us to what is special about Wisconsin and its people.”

Established in 1982, the Fellows program is the only Award that recognizes outstanding work across the sciences, arts and Letters in Wisconsin. The 2026 Class of Fellows will join over 100 current Fellows from around the state. New Fellows include **infectious disease researcher and healthcare leader Dr. David Andes**; nonprofit executive and visionary urban

planner Dr. Ruben Anthony; visual artist and master printmaker Emily Arthur; STEM equity advocate and psychologist



Dr. Angela Byars-Winston; pioneering choreographer and dancer Li Chiao-Ping; celebrated actor, director, and novelist James DeVita; choreographer and dance educator Simone Ferro; sculptor, curator, and visual artist Martha Glowacki; performing artist and psychologist Dr. Frederick Heide; environmental toxicologist and educator Dr. Rebecca Klaper; urban ecology pioneer and author Ken Leinbach; legendary broadcaster and life sciences communicator Larry Meiller; distinguished attorney and civil servant Lester Pines; Indigenous artist and cultural educator Melanie Tallmadge Sainz; surgical oncologist, innovator, and educator Dr. Sharon M. Weber; and multi-disciplinary artist, mentor, and curator Jason Yi.

Infectious disease researcher and healthcare leader Dr. David Andes is a global authority in infections and pharmacology whose work at the frontlines of medicine is saving lives across the world. Andes is the William Craig Professor in the Departments of Medicine, Medical Microbiology and Immunology, and Head of the Division of Infectious Diseases at the University of Wisconsin School of Medicine and Public Health. Andes is an internationally recognized clinician-

scientist in antimicrobial resistance whose research findings identify strategies to tackle this emerging public health threat. Many of his findings are being implemented in national and international guidelines.

Since its founding in 1870, the Wisconsin Academy of Sciences, Arts & Letters has been dedicated to the belief that the health of our state depends on the free exchange of ideas. The Academy Fellows program is the heartbeat of this mission, serving as the common ground where Wisconsin's most influential thinkers, creators, and problem-solvers meet. In a time of increasing fragmentation, these Fellows create a vital statewide network that unites our rural landscapes with our urban centers, bringing together leaders from across the sciences, arts, and letters to navigate our most complex challenges. These individuals are the modern stewards of the Wisconsin Idea. Together, they remind us that our greatest resource is our shared curiosity and our dedication to making this state a place where everyone can truly find a home.

Read more about the Wisconsin Academy Fellows Award at:

<https://www.wisconsinacademy.org/fellows>

MMI Affiliate Professor Anne Marie Singh Receives Vilas Mid-Career Award

Eighteen professors received Vilas Faculty Mid-Career

Investigator Awards, recognizing research and teaching excellence. The award

provides flexible research funding for three years.



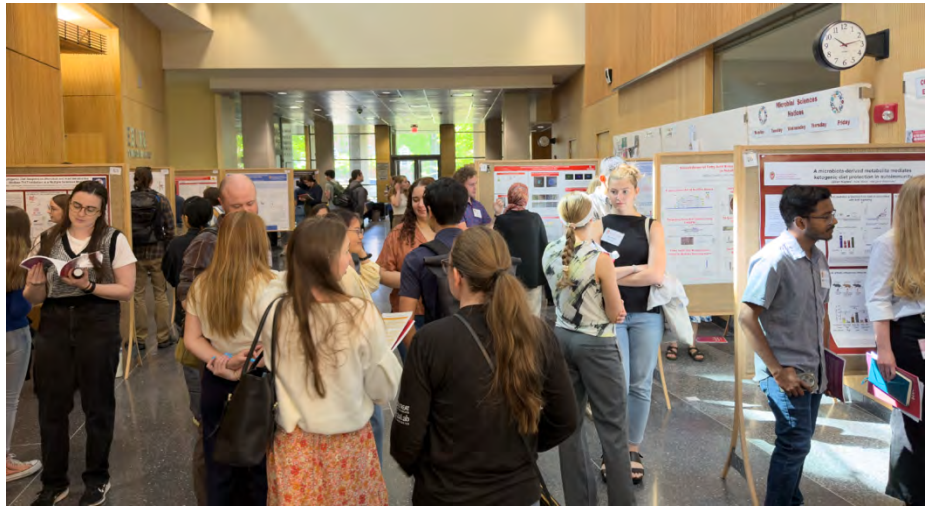
Anne Marie Singh, MD, is a professor of pediatrics, interim chief of the Division of Allergy, Immunology, and Rheumatology, and director of the Food Allergy Research and Education Clinical Research Center of Distinction. She also has affiliate appointments in the Departments of Dermatology and Medical Microbiology and Immunology and Food Research Institute. Singh completed her allergy-immunology fellowship at the University of Wisconsin-Madison.

Her research program is focused on advancing the clinical care of patients with early life atopic diseases, including atopic dermatitis and food allergy, as well as mechanistic studies on how environmental and microbial exposures affect the development of allergic diseases. The goal of her work is to enhance the clinical care of atopic patients by both advancing clinical care and by understanding mechanisms of disease. She is currently leading the Childhood Allergy and NeOnatal Environment (CANOE) birth cohort study in the NIH Environmental Childhood Health Outcomes (ECHO) study. She also co-leads the UW site for the Systems Biology of Early Atopy (SUNBEAM) CoFAR study, in addition to her translational work.

Record Poster Participation at 2026 Perlman Symposium on Antibiotic Discovery and Development

By: Allison Bauer | Dept. of MMI

The Department of Medical Microbiology & Immunology at the University of Wisconsin–Madison welcomed researchers and trainees on May 15 for the 2026 Perlman Symposium on Antibiotic Discovery and Development. The annual event brought together scientists from across disciplines to explore emerging discoveries in infectious disease research, antibiotic development, host-pathogen interactions, and the microbiome.



More than 60 posters were submitted to this year's Perlman Symposium.

This year's symposium featured a full day of scientific exchange, including presentations from four distinguished keynote speakers, trainee lightning talks, two poster sessions, and an afternoon reception. Attendees participated both in person and virtually, with free registration helping make the event accessible to a broad audience.

One of the most notable highlights of this year's symposium was the record number of poster submissions. The strong response reflected growing interest in antibiotic discovery and infectious disease research while showcasing the depth and diversity of work being conducted by students, postdoctoral researchers, and early-career scientists. The expanded poster sessions created opportunities for lively discussion, collaboration, and feedback throughout the day, reinforcing the symposium's role as a hub for scientific networking and trainee development.

The keynote program featured an outstanding lineup of researchers tackling some of the most pressing challenges in microbiology and infectious disease.

Kim Davis, PhD of Johns Hopkins University discussed her laboratory's work investigating heterogeneity within bacterial populations. By using innovative molecular tools and single-cell approaches, the Davis lab is uncovering how subsets of bacteria can evade antibiotic treatment and contribute to persistent infections, with the goal of identifying new therapeutic targets.

Victor Nizet, MD of UC San Diego shared insights from his research on bacterial pathogenesis and innate immunity. His laboratory continues to advance understanding of antibiotic-resistant pathogens by identifying virulence factors and mechanisms that enable bacteria to evade immune defenses.

Representing UW–Madison, **Federico Rey, PhD** highlighted research exploring the relationship between the gut microbiome, diet, and human health. His work examines how microbial communities influence susceptibility to cardiometabolic and aging-associated diseases, providing new perspectives on the role of microbiota in disease prevention and treatment.

Kendra Rumbaugh, PhD of Texas Tech University presented her research on wound infections and bacterial biofilms. Her work focuses on understanding how polymicrobial communities and quorum sensing contribute to infection severity and treatment resistance, with implications for improving therapies for chronic wounds.

The symposium also showcased emerging scientists through a series of trainee lightning talks. The award for **Best Lightning Talk** was presented to Marienela Heredia (Knoll Lab) for her presentation, *“Defining Antibody-driven Mechanisms of Pathogen Clearance in a Murine Model of Infectious Diarrhea.”* Her presentation highlighted innovative approaches to understanding immune-mediated protection against infectious disease.

The highly competitive poster sessions culminated in recognition of three outstanding presentations:

First Place: Hollie Wierschke, Sperandio Lab

“Role of Gut Microbial-Derived Indole in Behavior and Central Nervous System Modulation in Mice”

Second Place: Doran Goldman, Mo Lab

“Impact of Pseudomonas aeruginosa on Phage and Antibiotic Resistance in Methicillin-Resistant Staphylococcus aureus”

Third Place: Gillian Hughes, Alexander Lab

“The Microbiota Metabolite-Dependent Protective Effect of a Ketogenic Diet in a Mouse Model of Multiple Sclerosis”

As antibiotic resistance continues to pose a growing global challenge, events like the Perlman Symposium provide an important forum for sharing discoveries, fostering collaborations, and supporting the next generation of scientists. The record-breaking poster participation this year underscored the enthusiasm and momentum within the field, while the quality of presentations throughout the day demonstrated the exciting future of antibiotic discovery and microbiology research.

The Department of Medical Microbiology & Immunology thanks all speakers, presenters, attendees, judges, and organizers who contributed to another successful Perlman Symposium and looks forward to building on this momentum in the years ahead.

Jeniel Nett and Research Team Identify Target for Dangerous Fungal Infections

By Will Cushman | Office of Strategic Communication

A multidisciplinary team of researchers at the University of Wisconsin–Madison has identified a promising new therapeutic candidate against *Candida auris*, an emerging fungal pathogen that has alarmed health officials worldwide because of its ability to resist multiple antifungal drugs and spread rapidly through hospitals and care facilities.

“It’s a global public health threat,” says [Jeniel Nett](#), a professor in the Department of Medicine at the UW School of Medicine and Public Health. “*Candida auris* is the first fungus to spread in hospitals and cause serious disease.”

With funding from the National Institutes of Health, Nett led a team that closely studied the yeast in search of any weaknesses that could be exploited in the fight against it. The need is urgent; there are three major classes of antifungal drugs, and certain strains of *Candida auris* are resistant to all three of them.

While the fungus’s presence on skin isn’t itself life-threatening, there are many opportunities for internal exposure — whether through surgery, a catheter or other medical devices — where it can pose grave danger. Between 30 to 60% of patients who develop a *Candida auris* infection die, usually due to sepsis after the fungus enters their bloodstream after getting inside the body.

Most *Candida auris* infections respond to an intravenous medication that’s available, but even that is showing signs of vulnerability.

“There have been reports of *Candida* strains developing resistance to that, leading to a very serious infection,” says Nett.



Studying both synthetic conditions and human skin, Nett and her colleagues sought to learn everything they could about what *Candida auris* needs to colonize skin. The idea is that finding a way to short-circuit the skin colonization process could prevent possible infections.

The team identified potassium as essential to the growth of the fungus. Further, they constructed all kinds of mutant versions of *Candida auris*, with various genes deleted, and discovered that the elimination of a single gene was enough to stop the fungus from growing. The gene, called *TRK1*, controls a protein by the same name that transports the potassium required for *Candida auris* to grow and colonize skin and other surfaces.

The team [recently reported its findings in the journal of the Proceedings of the National Academy of Sciences](#).

“We’re really excited about this,” says Nett. “We’re very interested in the transporter because it’s structurally different between cells found in animals and in *Candida auris*, and so we think we could potentially identify drugs that could target it and disrupt the colonization of skin.”

Because fungi and animals are eukaryotes, a lot of their critical cellular machinery are similar in structure. The fact that *TRK1* in *Candida auris* has no counterpart in animals means that potential drug candidates that target the fungus may be safe in humans, Nett says.

The team, which also includes researchers in the Department of Biochemistry and the Department of Civil and Environmental Engineering, is now investigating whether its findings extend to other fungal species.

“And we’re starting to look at ways to identify inhibitors of the Trk1 protein,” says Nett. “A treatment of skin colonization would be a great place to start because there currently isn’t anything effective to remove *Candida auris* from skin.”

This research was received funding from the National Institutes of Health (R01AI145939; R2AI159583).

Upcoming MMI Seminars:

Sept 18

“Microbe-Based Strategies to Eradicate Uropathogens from the Urogenital Mucosa”

Dr. Katy Patras, Baylor College

12:05 pm CDT - 12:55 pm, 1520 MSB

Host: Vanessa Sperandio This seminar sponsored by the Rod Welch Distinguished Lectureship Fund.

Oct 9

“Toxoplasma Gondii Across Scales: RNA Acquisition, Microglial Responses, and Metabolic Control”

Dr. Bruno Martorelli Di Genova, University of Vermont

12:05 pm CDT - 12:55 pm, 1520 MSB

Host: Laura Knoll

Oct 16

“From Poop to Practice: Bridging Correlation and Causation in the Gut”

Dr. Jay Vornhagen, Indiana University

12:05 pm CDT - 12:55 pm, 1520 MSB

Host: JD Sauer

Dr. Laura Knoll Receives Grant for Biomedical Workforce Training Initiative

By: Wisconsin Partnership Program News

Laura Knoll, PhD, associate dean for basic research training and professor, Department of Medical Microbiology and Immunology, at the University of Wisconsin School of Medicine and Public Health (SMPH), has received a strategic start-up education grant from the Wisconsin Partnership Program (WPP) for the initiative *Career Development and Pathway Partnerships: Training the Future Leaders of the Wisconsin Biomedical Workforce*.

The award of \$900,000 over three years will build the capacity and leadership of Wisconsin's biomedical and health care workforce by preparing SMPH doctoral students to lead the state's expanding biotechnology and life sciences sectors.

This innovative biomedical workforce development proposal in partnership with the master of science in biotechnology program and the Wisconsin BioHealth Tech Hub provides additional experiences and robust training to PhD students each year to prepare them to join Wisconsin's biomedical research workforce.

"This project will build on lasting partnerships between UW-Madison and Wisconsin biotech employers to create sustainable pathways that retain top scientific talent in the state and prepare the next generation of biomedical innovators and health care leaders," said Knoll.

By integrating career exploration and industry engagement into doctoral training, the program

will equip trainees with the skills, experience and networks needed to transition confidently into the workforce.



"The Wisconsin Partnership Program has a strong legacy of investing in SMPH education initiatives to help meet Wisconsin's evolving health workforce needs," said Amy Kind, MD, PhD, SMPH associate dean for social health sciences and programs and WPP executive director. "We are thrilled to support this innovative initiative and the tremendous opportunity it provides to advance the career and professional development of SMPH doctoral students, ensuring they are prepared to serve and lead Wisconsin's biomedical research workforce."

Make an Impact in Medical Microbiology & Immunology!

The Department of Medical Microbiology & Immunology is committed to providing comprehensive scientific instruction, conducting meaningful research, and offering expert consultation and service in microbiology and immunology as they relate to human health and disease. Your gift helps us advance this mission, fueling innovation, education, and collaboration at every level.

Your generosity makes a lasting impact, empowering students, advancing research, and strengthening our scientific community. Thank you for helping us continue to lead and innovate.

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Medical Microbiology & Immunology Fund

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Dr. Andrew Mehle Honored with Prestigious Kellett Mid-Career Award

By: Allison Bauer | Dept. of MMI



Dr. Andrew Mehle has been selected as a recipient of the University of Wisconsin–Madison’s distinguished Kellett Mid-Career Award, one of the institution’s highest recognitions for faculty excellence.

The award recognizes outstanding faculty members who are seven to 20 years beyond their first promotion to a tenured position and who have demonstrated exceptional achievement in research, teaching, outreach, and service. Dr. Mehle joins an accomplished group of eleven faculty members selected from across the university’s academic divisions.

Established through the support of the Wisconsin Alumni Research Foundation (WARF), the Kellett Mid-Career Award was created to provide encouragement and critical support to faculty during a pivotal stage of their careers. Recipients receive \$75,000 to advance their scholarly and professional endeavors over a five-year period.

The award is named in honor of the late William R. Kellett, former president of the WARF Board of Trustees and former president of Kimberly-Clark Corporation. It recognizes faculty members whose work has made significant contributions to their fields and to the broader mission of the university.

Dr. Mehle’s selection reflects the impact of his scholarship, leadership, and dedication to advancing knowledge while contributing to UW–Madison’s tradition of excellence. As one of only eleven faculty members chosen for this honor, he is recognized among the university’s most accomplished mid-career scholars.

UW–Madison’s annual faculty fellowship awards celebrate the outstanding achievements of faculty members across the arts and humanities, physical sciences, social sciences, and biological sciences. According to Norman Drinkwater, then interim vice chancellor for research and graduate education, the awards highlight faculty efforts that support the university’s research, teaching, outreach, and public service missions.

The Kellett Mid-Career Award underscores Dr. Mehle’s continued contributions to academic excellence and positions him for even greater impact in the years ahead. His recognition reflects both his individual accomplishments and the strength of the research and educational community at UW–Madison.

Federico Rey and Collaborators Identify New Target in Gut for Reducing Alzheimer's Risk

By: Chris Barncard | Office of Strategic Communications

A compound produced by bacteria in most people's digestive tract increases the risk of developing Alzheimer's disease and speeds up cognitive decline in dementia patients, making it an attractive target for a treatment that could reduce Alzheimer's risk, according to a new study.

Nearly 10 years ago, researchers led by University of Wisconsin–Madison professors Barbara Bendlin and Federico Rey discovered that the communities of microbes living in the intestines of Alzheimer's disease patients differ from those of healthy people.

"Since then, we've been trying to figure out how this difference in the gut perhaps leads to changes in the brain," says [Bendlin, a professor of gerontology](#) in the UW School of Medicine and Public Health.

In [a recent study published in the journal Nature Communications](#), Bendlin, Rey and collaborators show that a compound called imidazole propionate (ImP) — produced in the gut by some types of bacteria — plays an important role in brain changes that result in Alzheimer's disease and related cases of dementia. Some people have guts that seem to produce a lot of ImP; some people don't.

"ImP-producing bacteria are present in a large fraction of people, but they're not very abundant in most people," says [Rey, a UW–Madison professor of bacteriology](#). "But something we have learned over the years is that a microbe doesn't have to be abundant to have an impact on the host."

ImP can spread from the gut to other parts of the body, where it has been implicated in type 2 diabetes and coronary artery disease. The researchers



showed that ImP that reaches the brain in mice increases the build-up of clumps of two abnormal proteins, called beta-amyloid and tau.

"That process eventually results in the death of neurons, and in humans is a key feature of Alzheimer's disease," Rey says.

By looking at ImP in the blood of almost 1,200 people who have participated in the Wisconsin Registry for Alzheimer's Prevention and studies at the Wisconsin Alzheimer's Disease Research Center, the researchers found that people with high ImP levels were far more likely to also show markers of dementia-related protein and neuron dysfunction.

"And because we have the results of cognitive tests these volunteers took over time, we can see that the people with the highest ImP levels also experienced much faster cognitive decline," Rey says.

The researchers also identified a genetic variation, present in about 43% of the people in the study, linked to accumulating much higher levels of ImP in the blood. The genetic difference might affect how well the kidneys sift out ImP so that the body can get rid of it.

Continued on next page

“This genetic variation has been associated with increased Alzheimer’s risk in large genetic studies before, and now we may understand why it’s connected,” Rey says.

The most significant implication of the new study may be that ImP could represent a way to help people avoid Alzheimer’s disease and related types of dementia. Unfortunately, ImP is produced by bacteria making energy from an amino acid called histidine, which is essential to human health and present in a lot of common foods — especially protein-rich ones.

“Generally improving your diet would probably help,” Bendlin says. “But it’s not as easy as saying, ‘Stop eating eggs’ or ‘Don’t eat so much red meat.’ Because you need histidine, and it’s all over the place.”

But narrowing the biochemical target to a single molecule in the blood or a single genetic change opens up exciting possibilities.

“It could be just like cholesterol, where people with elevated cholesterol take a drug, a statin, that reduces their risk for heart disease,” Bendlin says. “If we can find an inhibitor that can help decrease the levels of ImP in the blood, that could hopefully reduce the risk of Alzheimer’s and the speed of cognitive decline for a significant number of people.”

Collaborators on the new study included scientists from the University of California, Los Angeles and the University of Gothenburg.

This research was supported in part by grants from the Wisconsin Partnership Program and the National Institutes of Health (R01AG070973, R01AG083883, R01AG092220, R21AG089348, R01HL168493, R01DK143650 and U54HL170326) and the U.S. Department of Agriculture (WIS03073).

Meet Our Researchers: Shai Bel, PhD

Hometown: Rishon Le-Zion, Israel

Zodiac Sign: Cancer

Research Overview

The Bel lab uses state-of-the-art mouse models, combined with high resolution microscopy and molecular biology to understand how the intestine functions. They focus on two specialized epithelial cells, Paneth and goblet cells, to investigate how the intestine forms a barrier and why this barrier breaks down when inflammatory bowel diseases develop. Their mission is to understand why inflammatory bowel diseases develop and find clever ways to treat them.



What inspired you to select your field of study?

I started out in science working on colon cancer. As time went by, and I learned more about the gut, I became fascinated by the fact that such a system can actually function. We each have so many microbes residing just micrometers away from our immune system, yet when we're healthy our immune system doesn't attack them. The gut is the only organ in the body where this "tolerance" happens. To me, this makes the relationship between the host and its microbiota in the gut an absolute anomaly, which is why it never stops inspiring me to research it.

What is one piece of advice you would give to students?

Remember that science is like looking for a black cat in a dark room. This means that your advisor is fumbling in that dark room just like you are. They don't have flashlight either. The only difference between you is that your advisor's eyes have become a little more accustomed to the dark.

When you're not in the lab, how do you spend your time?

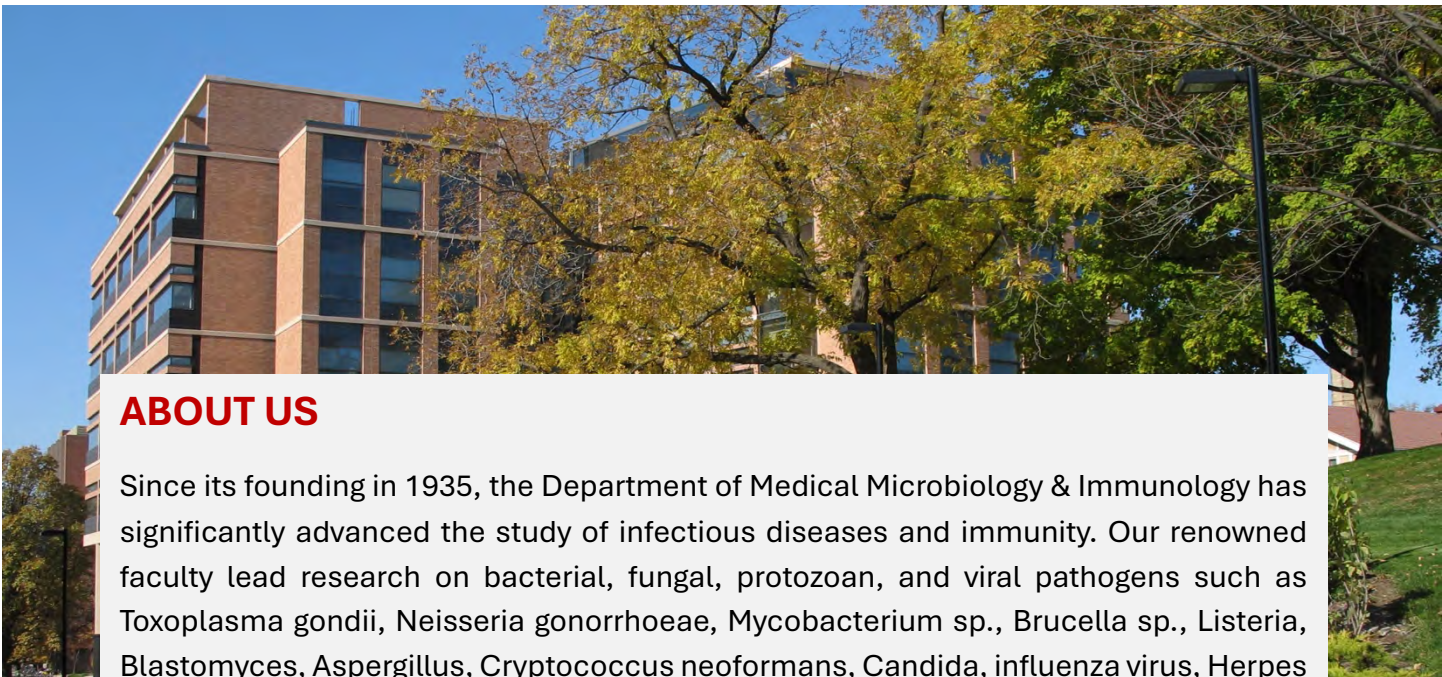
I have two boys, so I'm mostly breaking up fights. But when I'm not doing that, I like to play guitar and banjo.

You have to sing karaoke, what song do you pick?

The Drugs Don't Work by The Verve. And I hope you're wearing earplugs.

If you could have any superpower, what would it be?

The power to convince reviewers.



ABOUT US

Since its founding in 1935, the Department of Medical Microbiology & Immunology has significantly advanced the study of infectious diseases and immunity. Our renowned faculty lead research on bacterial, fungal, protozoan, and viral pathogens such as *Toxoplasma gondii*, *Neisseria gonorrhoeae*, *Mycobacterium* sp., *Brucella* sp., *Listeria*, *Blastomyces*, *Aspergillus*, *Cryptococcus neoformans*, *Candida*, influenza virus, Herpes simplex, enterohemorrhagic *E. coli*, and uropathogenic *Escherichia coli*. They also explore immunological topics including regulatory T cell biology, leukocyte migration and vaccine development. Additionally, our labs study the roles of diet, the immune system and the gut-brain-axis in the intestinal microbiome.

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