

2021 ANNUAL REPORT



IIT@MSU
INSTITUTE FOR INTEGRATIVE TOXICOLOGY

MICHIGAN STATE
UNIVERSITY

IIT ANNUAL REPORT 2021

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A **TRADITION** of EXCELLENCE

The Michigan State University Institute for Integrative Toxicology (IIT) is a multidisciplinary academic unit that supports and coordinates research and graduate education activities for faculty interested in various aspects of **toxicology**. The Institute is a **successor** to the Institute for Environmental Toxicology and the Center for Environmental Toxicology, the latter founded in 1978. While the name of the unit has changed over the years to denote changes in the **leadership** and academic position, the mission has been the same. For over 40 years, toxicology at Michigan State has provided **excellence** in training graduate students, facilitating research, and providing service to the State of Michigan when needed. The successes generated in these endeavors have resulted in **recognition** of Michigan State as a leader in academic toxicology.

The Center for Environmental Toxicology was initiated primarily to **assist** the State of Michigan with environmental contamination issues such as those arising from the PBB (polybrominated biphenyls) incident in the early 1970s. That unfortunate event was initiated by the accidental

contamination of feed for dairy cattle with PBBs. These dioxin-like chemicals and dioxin itself remain a major topic of research at Michigan State University.

Several years after the founding of the Center for Environmental Toxicology, a dual-major Ph.D. program in environmental toxicology was offered in conjunction with several cooperating departments. The characteristics of the program were **unique** at that time as students were required to complete the Ph.D. requirements of a department of their choice in addition to the didactic requirements and toxicology research specified by the Center. The **quality** of this cross programmatic effort was recognized by the National Institutes of Health in 1989 with the award of a Training Grant from the National Institute for Environmental Health Sciences. This grant has been competitively renewed ever since, providing over 30 years of continuous funding. Graduates of MSU's toxicology program number over 200 and can be found in academia, industry, and governmental positions. ♡

MESSAGE from the DIRECTOR



The challenges continued in 2021 with the ongoing pandemic, however, the Institute for Integrative Toxicology has continued to thrive in education, research and collaboration.

We were pleased to welcome Dr. Lance Blevins, Dr. Brian Johnson, Dr. Rance Nault and Dr. David Tonucci to our affiliated faculty ranks this year bringing our

total number of faculty to eighty-one. This outstanding group of researchers has continued to successfully compete for grant funding as well as have their research featured at conferences and in news outlets despite the challenges of the past year. Their expertise in their chosen fields span twenty-eight different departments and programs across campus and we feel fortunate to have each and every one of them on our IIT team.

Our students have adapted amazingly to the various temporary regulations due to the pandemic and have successfully continued their research and education under less than optimum circumstances. Many have attended virtual meetings, presented their research and earned awards this year, as they have so successfully done in prior years.

Our affiliated center under the IIT umbrella, the Center for Research on Ingredient Safety (CRIS), has had a productive 2021 as well. CRIS was able to publish two groundbreaking papers on cannabidiol research this year. The first publication is a consumer-focused collaborative white paper that highlights the

current state-of-the-science and regulations concerning CBD, “The current understanding of the benefits, safety, and regulation of cannabidiol in consumer products,” in *Food and Chemical Toxicology*. Many thanks to Dr. Jinpeng Li, Ricardo Carvajal, Esq., and Dr. Leon Bruner for an excellent collaboration. The second publication, “Cannabidiol selectively modulates interleukin (IL)-1 β and IL-6 production in toll-like receptor activated human peripheral blood monocytes,” published in *Toxicology*, explores the potential anti-inflammatory activity of cannabidiol (CBD). Many thanks to Dr. Jinpeng Li, Sera Sermet, Anthony Bach, and Robert B. Crawford for their diligent work on this project. CRIS was also pleased to host our Annual Meeting and Science Day, November 8-10. This year’s meeting featured experts and information on packaging ingredients.

Lastly, a large cadre of our faculty continue to be extremely productive in their research activities and engagement with community and regulatory agencies related to work on dioxin and dioxin-like compounds as part of our NIH funded Superfund Research Center.

The IIT welcomes 2022 with aspirations of continued success in the coming year, hopefully under more ideal circumstances.

A handwritten signature in blue ink that reads "Norbert E. Kaminski".

Norbert E. Kaminski, Ph.D., IIT Director

2021 IIT HIGHLIGHTS

With continued challenges around the globe due to the pandemic, the faculty and trainees of the IIT faced these adversities head on and continued to expand the quality and leadership of Michigan State University in academic toxicology through their numerous accomplishments.

IIT Faculty & Students Honored Virtually by Society of Toxicology in 2021

This year's 60th Annual SOT meeting was held virtually over two weeks in March. Many IIT-affiliated faculty and students participated this year and several were recognized for their achievements.

- » **Jenna Strickland**, EITS student training with Dr. Bryan Copple, received the Carl C. Smith Award, 2nd place, from the Mechanisms Specialty Section for her abstract, "Exaggerated interleukin-10 expression inhibits macrophage-dependent liver repair in acetaminophen-induced acute liver failure."
- » **Kathryn Wierenga**, EITS student training with Dr. James Pestka, received the Molecular & Systems Biology Specialty Section Graduate Student Research Award, 1st place, and the Immunotoxicology Specialty Section Best Presentation by a Student Award for her presentation, "Phenotypic stability and application of a self-replicating murine alveolar macrophage model derived from fetal liver."
- » **Dafna Groeneveld**, postdoctoral fellow in the laboratory of Dr. James Luyendyk, received the Profes-

or Heimburger Award from CSL Behring for her research on, "Novel hemostatic supplementation to prevent postoperative liver dysfunction after partial hepatectomy."

- » **Dan Rajasinghe**, postdoctoral fellow in the laboratory of Dr. James Pestka, received the Occupational and Public Health Specialty Section Best Manuscript - Postdoctoral Award, Food Safety Specialty Section Frank C. Lu Early Career Scientist Award, Immunotoxicology Specialty Section Best Presentation by a Postdoctoral Trainee Award, and the Mechanisms Specialty Section Sheldon D. Murphy Postdoctoral Endowment.
- » **Dr. Jamie Bernard** received the James A. Swenberg Carcinogenesis Merit Award from the Carcinogenesis Specialty Section. The award recognizes outstanding individuals for their cumulative contributions to advancements in understanding the mechanisms of environmental agent-associated carcinogenesis.
- » **Dr. Sudin Bhattacharya** was selected to serve as Co-Chair for the SOT 2021 Continuing Education Course on Advances in Single Cell Genom-

ics for Toxicological Testing.

- » **Dr. Rita Strakovsky** was invited to speak during the symposium, "From Conception to Cane: Unique Life-Stage Considerations for Reproductive Toxicity." Strakovsky spoke on, "Endocrine-Disrupting Chemicals in Pregnant Women and Potential Modifying Factors."
- » **Dr. Norbert Kaminski** gave his 2020 Merit Award Lecture this year and spoke on, "Unraveling the Molecular Mechanisms of Cannabinoid-Mediated Immune Modulation and Cannabinoid Receptor 2 as a Putative Therapeutic Target."
- » **Dr. Bill Atchison** was the recipient of supplemental funding from the Faculty United for Toxicology Undergraduate Recruitment and Education (FUTURE) Committee. The funds will be used to add capacity to Dr. Atchison's undergraduate summer research program, whose goal is to increase the number of underrepresented minority students trained in the neurosciences.

Congratulations to all the IIT-affiliated SOT award winners this year! 🎉

Three IIT- Affiliated Faculty Receive Promotions



The IIT would like to congratulate three affiliated faculty members who recently received faculty promotions. **Dr. Karen Liby** was promoted to Professor in the



Department of Pharmacology and Toxicology. **Dr. Jamie Bernard** was promoted to Associate Professor in the Department of Pharmacology and Toxicology.



Dr. Gina Leinninger was promoted to Associate Professor in the Department of Physiology and the Neuroscience Program.

IIT Welcomes Four New Faculty in 2021

The IIT is pleased to welcome four new faculty members in 2021 - Dr. Lance Blevins, Dr. Brian Johnson, Dr. Rance Nault, and Dr. David Tonucci.



Dr. Lance Blevins received his B.A. in Biology from the University of North Carolina at Chapel Hill in 2007. In 2016, he received his Ph.D. in Molecular and Cellular Biosciences (Immunology) from Wake Forest University. Blevins completed his postdoctoral work at MSU with Dr. Norbert Kaminski. Today, Blevins is an Assistant Professor here at the Institute for Integrative Toxicology.

Dr. Blevins research is generally focused on the field of adaptive immunology; specifically, he is interested in the regulation of lymphocyte effector functions during infection and by exposure to immune toxicants. A major emphasis of his research has been in identifying human B cell subsets which exhibit selective sensitivity to Aryl hydrocarbon (AHR)-mediated immunotoxicity elicited by the xenobiotic, 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD), a potent ligand of the AHR, and other dioxin-like compounds. This research has identified human CD5⁺ innate-like B cells (ILB) as being preferentially sensitive to AHR activation as evidenced by robust reductions in the ability to secrete immunoglobulin M (IgM) following exposure to TCDD, which is due in part to higher expression of AHR in CD5⁺ B cells compared to CD5⁻ B cells. As there is a dearth of studies focused on human CD5⁺ ILB and the role of AHR, Blevins is currently focused on further characterization of this understudied immune cell population, while elucidating the molecular mechanism of TCDD-mediated immunotoxicity in CD5⁺ ILB.

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Dr. Brian Johnson received his B.S. in Biology from Michigan Technological University in 2004. In 2013, he received his Ph.D. in Molecular and Environmental Toxicology from the University of

Wisconsin. He continued on at the University of Wisconsin to complete his postdoctoral work from 2014 to 2019 in Biomedical Engineering. Today, Johnson is an Assistant Professor in the Department of Pharmacology and Toxicology and the Department of Biomedical Engineering at MSU.

Johnson's interdisciplinary research laboratory specializes in the design, manufacturing, automation and testing of human derived models of development and disease to study intercellular signaling. They employ digital manufacturing (CNC machining and 3D printing) to construct biomimetic microenvironments that recapitulate intercellular signaling in development and disease. Current research directions include 1) identifying the potential for chemical mixtures to disrupt epithelial: mesenchymal signaling in orofacial development leading to cleft lip/palate 2) developing high-throughput multicellular models of breast and prostate cancers to identify mechanisms of treatment resistance and uncover therapeutic targets in the cancer microenvironment 3) using multicellular models of the hypothalamic - pituitary - thyroid axis to inform computational modeling of thyroid homeostasis and perturbation by chemical insults. Johnson's translational research goals are to develop strategies and enable technologies that increase precision in the treatment of disease and to identify chemical exposures that lead to birth defects in vulnerable populations.



Dr. Rance Nault received his B.Sc. in Biology from the University of Ottawa in 2009. In 2011, he received his M.Sc. in Physiology with a specialization in Chemical and Environmental Toxicology. Nault earned his Ph.D. from MSU in Biochemistry and Molecular Biology and Environmental Toxicology in 2016. During this time Nault was part of the IIT's EITS program, mentored by Dr. Timothy Zacharewski. Today, Nault is an Assistant Professor in the Department of Biochemistry and Molecular Biology at MSU.

Nault's research is focused on using high throughput 'omic' and targeted phenotypic endpoints to examine the

Nault's research is focused on using high throughput 'omic' and targeted phenotypic endpoints to examine the

health consequences of exposure to environmental and food contaminants. Technological innovations have enabled researchers to evaluate hundreds to thousands of molecules in a single sample, and along with these new platforms comes the challenges of analyzing, interpreting, and integrating the large datasets. Through a combination of wet lab and computational approaches, Nault leverages these technologies to investigate mechanisms and dose-responses of liver toxicants. Two current major areas of emphasis are 1) the use of single-cell sequencing technology to refine understanding of liver toxicity and 2) developing the framework to support the robust collection and sharing of high-quality data to promote reuse. The overarching long-term goal of Nault's research is to accelerate the mechanistic understanding of toxicant induced liver injury and improve the translation to human risk.



Dr. David Tonucci received his B.A. in Medical Anthropology at Case Western Reserve University in 1984. In 1994, he received his Ph.D. in Pharmacology and Therapeutics from SUNY Buffalo School of Medicine and Biomedical Sciences.

Dr. Tonucci's research interests focus on the safety evaluation of emerging technologies related to food ingredients and food technologies. A primary interest is identifying appropriate preclinical and clinical safety program design relevant to food ingredients made from biotechnology and synthetic biology.

Dr. Tonucci has spent much of his career developing programs to support the registration and approval of new food ingredients on a global scale. Dr. Tonucci is currently the Vice President for Regulatory & Toxicology at Artemys Foods and joins the IIT as an adjunct faculty member. Artemys is a biotechnology company focused on reducing the world's dependence on farm raised livestock. Their focus is developing 'cultured meat' to be used in combination with plant-based components to produce a more authentic meat substitute. As this is an emerging technology in the food industry, the development of a robust safety assessment process will be critical to successful commercialization. 🍌

EITS TRAINING PROGRAM

An overview of the current EITS training program and review of 2021 activities.

The Environmental and Integrative Toxicological Sciences (EITS) graduate program continues to be one of the premier toxicology training programs in the U.S. This MSU training program administered by the IIT is a “dual major” format that emphasizes excellent basic science training from one of our 16 partnering graduate programs coupled with didactic and research training in toxicology by MSU IIT-affiliated faculty. Currently, 32 doctoral students are enrolled in the EITS program, distributed among several of our partnering PhD programs. Twenty-four of these students are in the Biomedical Track, five in the Environmental Track, and three students are currently enrolled in the new Food Toxicology and Ingredient Safety Track. Many of our current students received awards at the 2021 Annual Meeting of the Society of Toxicology (SOT) or from other organizations. Our students continue to demonstrate good citizenship by volunteering to serve on Society committees at the regional and national levels as well as within MSU. Students who graduated in the past year have accepted postdoctoral positions at various academic institutions in the U.S. and other countries or began careers at some of the largest corporations in the country.

The National Institute of Environmental Health Sciences (NIEHS) Training Grant, that the IIT has received with continuous funding since 1989, continued in 2021. The training grant offers stipend and tuition support for 7 predoctoral and 2 postdoctoral fellows each year. Universities compete nationally for training grant support from NIEHS. The longstanding support by NIH of the MSU-IIT is a testament to the excellence that the EITS program has maintained over three decades in training graduate students and postdoctoral fellows, many of whom have become leaders in the field of toxicology. 🌱

EITS GRADUATES 2021



Christine Ponnampalam

Genetics
Mentor, Brian Gulbransen

Novel impacts of host-environment interactions on enteric glia through sequencing and in situ expression



Nikita Saha Turna

Food Science & Human Nutrition
Mentor, Felicia Wu

Co-exposure of aflatoxin and fumonisin in Nigerian maize and the non-carcinogenic risk of aflatoxin in southwest Nigerian children and adults



Jenna Strickland

Pharmacology & Toxicology
Mentor, Bryan Copple

Cytokine Dysregulation Disrupts Macrophage-Mediated Liver Repair, Triggers Hepatic Encephalopathy, and Increases Mortality in Acetaminophen-Induced Acute Liver Failure



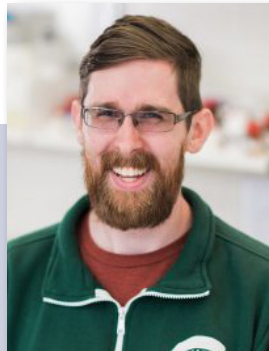
Kathryn Wierenga

Biochemistry & Molecular Biology
Mentor, James Pestka

Omega-3 Fatty Acid Suppression of Silica-induced Inflammation and Autoimmune Disease

GRADUATE SPOTLIGHTS

EITS graduates are sought for careers in industry, government and academia. Below we feature four alumni and their paths after graduation from the EITS program.



Kevin Baker

Scientist I, Toxicology, Takeda Pharmaceuticals

At a glance:

Department: Pharmacology and Toxicology

Mentor: James Luyendyk

Dissertation:

“Mechanisms Regulating Tissue Factor: Factor VIIA-Dependent Coagulation in Liver Disease”

Defended: Summer 2020

Significant Achievements During Graduate School:

- » John A. Penner Endowed Research Assistantship, 2019-2020
- » Integrative Pharmacology Sciences Training Program Fellowship, 2016-2018
- » Thorp Family Trainee Travel Award, 2018, 2019
- » Best Oral Presentation at the 28th Annual Phi Zeta Research Day, 2018
- » Poster of Distinction, International Society on Thrombosis and Haemostasis, 2017
- » Michigan State University Institute for Integrative Toxicology Travel Award (SOT), 2016, 2017, 2018, 2019
- » Carl C. Smith Award Finalist, Mechanisms Specialty Section of the SOT, 2017

An inorganic chemistry course in Kevin Baker’s junior year of college sparked his interest in science. Science became a means to understand the world around him and the interest soon turned into a passion during his following years of engaging in research. After earning his Bachelor of Science in Microbiology and Genomics/Molecular Genetics with a dual major in Japanese at Michigan State University, Baker continued on at MSU and earned his Ph.D. in Pharmacology and Toxicology with a dual major in Environmental Toxicology. Baker trained with Dr. James Luyendyk and completed his dissertation, “*Mechanisms Regulating Tissue Factor: Factor VIIA-Dependent Coagulation in Liver Disease*,” in the summer of 2020.

Today, Baker is a scientist working in the field of toxicology at Takeda Pharmaceuticals in Cambridge, MA. Within the Investigative Toxicology team, Baker serves a project facing role to support the company’s liver-focused programs. One of Baker’s primary functions is developing and optimizing in vitro models to predict toxic effects of compounds. In this role, he is responsible for the development of hypotheses, execution of experiments, and working with other groups both inside and outside of the organization to do the best possible research. The overall goal of Baker’s work is to make medicines safer.

Baker originally applied to Takeda Pharmaceuticals after a colleague recommended the position. Baker was impressed with the wide range of compounds in Takeda’s pipeline and their overall “patient first” attitude when he accepted the position. Having been in the position for over a year now, Baker is thankful that his role at the company has allowed him to expand his expertise within liver toxicology while also

allowing him to develop expertise in other areas like genotoxicity and next generation sequencing technologies. He also has been able to sharpen his dwindling Japanese language skills since the company is based in Japan.

Baker’s training and exposure to toxicology as an EITS student has greatly affected his success today. Baker is most thankful for the excellent network EITS provided for his career goals – the EITS program’s support in enabling him to attend various conferences during his time as a graduate student as well as bringing in exceptional seminar speakers. Baker believes networking is critical and exposure to other areas of toxicology is incredibly important for the development of young toxicologists. Many of the challenges he faces every day exist outside the area of his expertise. However, exposure to other fields as an EITS student allowed Baker to have the tools to adequately develop a hypothesis, conduct the right experiments, and solve the problem at hand. “I would not be as successful as I am now without the support of EITS,” commented Baker.

Baker looks forward to continuing in his role at Takeda Pharmaceuticals and working toward his long-term career goal to manage a group of scientists within toxicology. 🍀



Kelly Fader

Principal Scientist, Drug Safety Research & Development, Pfizer, Inc.

At a glance:

Department: Biochemistry and Molecular Biology

Mentor: Timothy Zacharewski

Dissertation: “The Role of the Intestine-Liver Axis in TCDD-Elicited Non-Alcoholic Fatty Liver Disease”

Defended: Fall 2018

Significant Achievements During Graduate School:

- » SOT Carl C. Smith Graduate Student Award 2nd Place, 2017
- » SOT Michigan Chapter Poster Presentation 1st place, 2018
- » MSU College of Natural Science Completion Fellowship, 2018
- » MSU Biochemistry and Molecular Biology Outstanding Graduate Student Award, 2018
- » NIEHS Superfund Research Program Health Sciences Poster Award 1st place, 2017
- » Canadian Institutes of Health Research (CIHR), Doctoral Foreign Study Award, 2015
- » Institute for Integrative Toxicology Travel Award, 2018, 2019

A love for solving puzzles through analytical and critical thinking led to Kelly Fader’s career in toxicology today. After earning her Honours Bachelor of Science in Biomedical Toxicology from the University of Guelph, Fader came to MSU to earn her Ph.D. in Biochemistry and Molecular Biology with a dual major in Environmental Toxicology. Fader trained with Dr. Timothy Zacharewski and completed her dissertation, “*The Role of the Intestine-Liver Axis in TCDD-Elicited Non-Alcoholic Fatty Liver Disease*,” in the fall of 2018.

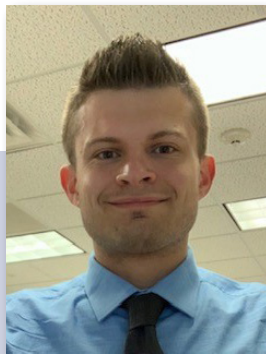
Today, Fader is a Principal Scientist in the Drug Safety Research and Development (DSRD) department at Pfizer, Inc. in Groton, Connecticut. Beginning her pharmaceutical career in preclinical drug development provided a natural progression from her graduate and post-doctoral work which focused on rodent models of metabolic disorders. Within the ‘Safety Biomarkers – Transitional Omics’ group, her position involves the discovery, development, validation and translation of novel multi-parametric biomarker panels for characterizing drug safety and pharmacology. She uses an integrated systems approach to elucidate mechanisms of disease pathogenesis and drug-induced tissue injury. Biomarkers are essential tools for identifying, monitoring, and mitigating potential safety risks of novel therapeutics. Strategic use of biomarkers during drug development allows Pfizer to bring novel therapeutics to patients faster, meeting unmet medical needs and improving patient health/well-being.

Fader’s experience working in the pharmaceutical industry has so far exceeded her expectations. She particularly enjoys contributing to projects across various toxicological specializations including neurodegeneration, immunotoxicity, and metabolic diseases. Fader also enjoys brainstorming biomarker strategies, analyzing and integrating large omics datasets, and collaborating with colleagues across various disciplines and departments.

Fader found her time as an EITS student invaluable to her career today.

Through her EITS classwork and attendance at the IIT seminar series, Fader was exposed to toxicological research involving various specializations, organ systems, and scientific approaches. “This multi-disciplinary education prepared me for the diversity of projects and responsibilities within my current position,” commented Fader. “Moreover, my participation within EITS provided me with a solid foundational understanding of key toxicological concepts, which I apply daily in the analysis of drug safety profiles.” Fader was also thankful for the IIT travel awards that allowed her to attend several national conferences throughout her graduate career where she was able to present her research and network with scientists across academia, industry, and government.

Fader finds it fulfilling and rewarding to contribute to research which improves human health and well-being. Her ultimate goal is to pursue a career in clinical science where biomarkers can be strategically implemented throughout the drug development pipeline to enrich clinical trials and ensure racial/ethnic diversity in medicine. 🍀



Michael Rizzo

Associate Principal Scientist, Scientific Affairs, PepsiCo

At a glance:

Department: Cell and Molecular Biology

Mentor: Norbert Kaminski

Dissertation:

“ Δ^9 -Tetrahydrocannabinol Suppresses Human Monocyte Activation and Monocyte-Mediated Astrocyte Inflammation: Implications for HIV-Associated Neuroinflammation”

Defended: Summer 2019

Significant Achievements During Graduate School:

- » Runner-Up Award SOT Immunotoxicology Specialty Section (ITSS) Best Presentation by a Graduate Student, 2018
- » Pre-doctoral Trainee NIEHS Training Grant in Environmental Toxicology, 2016
- » Arthur Falek Early Career Investigator Award for the Most Outstanding Pre-Doctoral Presentation, Society for NeuroImmune Pharmacology, 2016
- » Institute for Integrative Toxicology Travel Award, 2016, 2017

Michael Rizzo began his undergraduate college education with an interest in biology-related courses and let his love of research lead him to his career today. After earning his Bachelor of Science in Genomics and Molecular Genetics from Michigan State University, Rizzo continued at MSU earning his Ph.D. in Cell and Molecular Biology with a dual major in Environmental Toxicology. Rizzo trained with Dr. Norbert Kaminski and completed his dissertation, “ Δ^9 -Tetrahydrocannabinol suppresses human monocyte activation and monocyte-mediated astrocyte inflammation: Implications for HIV-associated neuroinflammation,” in the summer of 2019.

Today, Rizzo is an Associate Principal Scientist at PepsiCo in the area of food toxicology and risk assessment. Rizzo’s role has several core responsibilities that ultimately help to ensure PepsiCo’s food and beverage products are safe for consumers. One of his key responsibilities is to support internal cross-functional innovation projects by performing toxicological risk assessments on ingredients and contaminants. Rizzo also is responsible for evaluating the safety of new food packaging materials to support PepsiCo’s sustainability goals. Lastly, Rizzo is involved in various trade associations and scientific organizations that seek to address industry wide topics and issues on food and beverage safety.

When Rizzo accepted the position, he was excited to join a team that uses their toxicology expertise to ensure the safety of food and beverage products for consumers. The work also fit into his long-term career goals in several ways. Rizzo’s current role allows him to gain critical experience in applied food toxicology and risk assessment, while also allowing him to enhance his critical thinking and problem-solving skills. As a scientist at PepsiCo, Rizzo also is able to experience a collaborative and cross-functional work environment to better understand how a global company functions. Rizzo’s experience at PepsiCo so far has exceeded his expectations and he enjoys the fast-paced environment

and the wide variety of projects he gets to be involved with.

Throughout his graduate school experience, Rizzo believes the EITS program put him in a great position to find a career he could enjoy and in which he could make an impact. Specifically, the EITS program provided Rizzo with the appropriate training in toxicology to be an important contributor in his current role. “My interactions with the faculty in the EITS program, whether through specific courses or direct conversations, enabled me to grow my critical thinking skills in applied toxicology,” Rizzo commented. He also found that the ability to travel to conferences through the funding of the EITS program was essential in helping to build his network and communication skills as a toxicologist today.

Rizzo looks forward to continuing to expand his career as a toxicologist in the food industry. 🍌

EITS Alum Brandon Armstrong

Aquatic Biology Specialist



Brandon Armstrong's passion for natural resource protection began with his childhood experiences trouncing through Michigan's hardwoods during deer season and wading through cold water streams in search of the elusive brook trout alongside his father. After earning his Bachelor and Masters of Science in Fisheries and Wildlife from Michigan State University, Armstrong continued on at MSU and earned his Ph.D. in Fisheries and Wildlife with a dual major in Environmental Toxicology. Armstrong trained with Dr. Cheryl Murphy and completed his dissertation, "*Using Computational Models to Scale Sublethal Effects of Stressors to Adverse Population Outcomes in Fish*," in the winter of 2016.

After receiving his Ph.D., Armstrong was hired as a toxicologist for the Michigan Department of Environmental Quality (now known as the Michigan Department of Environment, Great Lakes, and Energy; EGLE). His primary duty in that position was to evaluate potential impacts of toxicants in water on human health. This included deriving risk-based criteria and ensuring that discharges of substances to groundwater and surface water would not result in

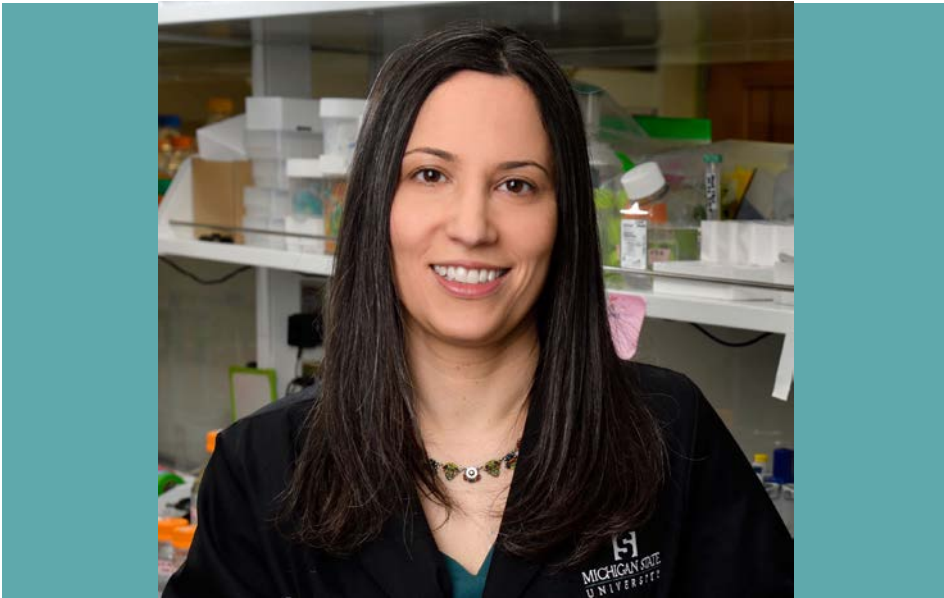
adverse human health effects. As time permitted, Armstrong conducted ecological assessments of contaminants on aquatic life and wildlife as well as developed monitoring plans aimed at assessing per- and polyfluoroalkyl substances (PFAS) contamination in Michigan's watersheds. After nearly four years in this position, Armstrong took over the Fish Contaminant Monitoring Program (FCMP) as an Aquatic Biology Specialist for EGLE, which is his role today. As the FCMP coordinator, Armstrong is responsible for developing an annual fish collection plan, analyzing and interpreting fish contaminant data, and serving as EGLE's liaison between various federal, state, tribal and provincial agencies regarding chemical contaminants in fish. He often provides advice to internal and external customers regarding the validity of sampling designs and statistical methods used to monitor, interpret, and regulate bioaccumulative chemicals of concern. For the last two years Armstrong has also overseen EGLE's PFAS surface water monitoring program. This involves determining which watersheds are targeted for PFAS sampling as well as assisting with source tracking efforts to reduce PFAS contamination in Michigan's water bodies. His role directly influences the fish consumption advisories that are set by Michigan's Department of Health and Human Services as part of their Eat Safe Fish program as well as EGLE's decisions on remediation of potential contamination problems.

Today, Armstrong's mentor at EGLE has only strengthened his passion for protecting the earth's natural resources as they, in his words, "try to save the world." Armstrong appreciates how his role at EGLE is a very tangible experience where he gets to see the direct outcomes of his work. Many of the contamination issues he is involved with are challenging as there can be direct health impacts to anglers consuming fish from contaminated water bodies. Tracking

down source(s) of that contamination and getting to work alongside other state agencies to address the issues has been personally satisfying to Armstrong. Particularly in areas where they have seen drastic improvements to contamination across a watershed and knowing that he has played a role in that improvement in some small way has been one of the most incredibly rewarding aspects of his career so far.

Armstrong viewed his time as an EITS student an invaluable experience that amplified his passion for natural resource protection and ultimately led him to a career with EGLE. He credits his successful transition from student to employee to several factors: the hands-on experiences provided to him as a student in Dr. Cheryl Murphy's lab, the knowledge gained from the diverse coursework that the program offered, and the awards that he received from the EITS program to attend scientific conferences and meet so many of the colleagues that he interacts with today. Dr. Chou's course in Human and Environmental Risk Analysis was crucial in understanding the risk assessment process that directly relates to his duties as a toxicologist for the State. Now as an aquatic biologist, Armstrong utilizes many of the concepts learned during Dr. Murphy's Fish Ecophysiology and Toxicology course. "I will always be appreciative of the opportunities the EITS program offered me, especially the chance to meet so many students and faculty with diverse backgrounds," said Armstrong. "The ability to learn from and alongside accomplished professors and inspiring students during the EITS program directly benefited my career where I am often working on interdisciplinary teams tackling very challenging problems." 🍎

FACULTY FEATURES



Alison Bernstein

Assistant Professor, Translational Science & Molecular Medicine

After excelling in AP Biology and Introduction to Psychology classes in high school, Dr. Alison Bernstein decided to attend the University of Pennsylvania for a degree in the Biological Basis of Behavior, which is now known as the Neuroscience program. She enjoyed the variety of science courses she was able to take and her lab work so decided that graduate school was the next step on her career path. First, she had a thirst to see the world a bit and spent several months in Australia and New Zealand, working as a waitress in Sydney during the summer Olympics that year. She submitted graduate school applications from Sydney and eventually returned to the US for her interviews shortly after.

With an interest in Alzheimer's research due to a history of it in her family, Bernstein attended Washington University in St. Louis studying molecular genetics and genomics. Her interest in Alzheimer's research eventually led her to delve into the world of Parkinson's research as well when she was recruited into a lab focusing on that topic. Her time there was focused on models of Parkinson's Disease (PD) based on injected toxicants, which led to her current focus - understanding how environmental risks contribute to

disease in the real world.

After moving to Atlanta for her husband's postdoctoral position at Georgia Tech and taking time to welcome their first child into the family, Bernstein pursued her own postdoctoral position at Emory University in neuroscience, neuroepigenetics, and neurotoxicology in the laboratory of Dr. Gary Miller. It turned out to be the perfect position for Bernstein as she was able to learn more on the role of pesticides in PD and start to think about how epigenetics may play a role in PD. Specifically, how do these real life small exposures to toxicants over a lifetime contribute to the burden of disease later in life and how are they saved in the body.

During her second postdoctoral position at Emory, Bernstein received a K99 and learned a lot from her mentoring team including human pathology, epigenetics, and data analysis, which has set her up for success as a researcher today. Now an Assistant Professor in the Department of Translational Neuroscience at MSU, Bernstein values the collaborators available to her in her own department and across campus, which is one of the reasons she chose to work at MSU. The ability to seek out a colleague with a different skill set that lets you

further your own research in new and exciting ways has been one of the best parts of working at MSU for Bernstein.

Currently, Bernstein and her laboratory have three main areas of research all related to the overarching goal of understanding how exposures early in life, when the nervous system is developing, can then affect disease later in life and the role that epigenetics plays in the development of PD.

The first area of research they focus on uses human postmortem brain tissue to look for epigenetic differences between healthy brain tissue and Parkinson's disease tissue. The second area of research in the Bernstein laboratory uses in vivo exposure models, working in collaboration with Carol Sortwell's laboratory. The two teams have demonstrated that early life exposures to the pesticide dieldrin makes male offspring more susceptible to neurotoxicity in the a-synuclein pre-formed fibril model. These discoveries have opened up several new lines of research for Bernstein's laboratory. The third research area uses in vitro 3D cell models to explore mechanistic connections between epigenetic changes and neuronal function.

Bernstein's path to her career as a researcher at MSU today was never linear and her favorite advice for her own students revolves around being open to possibility. "I think it is really important for students to know that not everything is planned in our careers. We tend to talk about our career paths as very linear stories, but I think that does students a disservice. In reality, life and career plans are messy. We go around turns and we go backwards and we take detours and life happens. And we need to talk openly about the messy reality of navigating this career path." ♡



Brian Gulbransen

MSU Foundation Associate Professor
Physiology & Neuroscience Program

Wildlife and animal research fascinated Dr. Brian Gulbransen from an early age. After reading an article in Wyoming Wildlife Magazine on zoologists who worked for the state conducting remote fish surveys, Gulbransen chose to attend the University of Wyoming studying zoology. As an undergraduate in the Honors program, he was encouraged to get involved in a research laboratory to explore his interests. After seeing a poster talking about the ‘brain in your gut’ on a stroll around his department, Gulbransen sought out a researcher who could teach him about the subject. He joined Dr. Paul Wade’s laboratory as an undergraduate assistant and got to study age related neuron death, specifically the neural control of gut functions and based his undergraduate project on this research.

Gulbransen ended up at the University of Colorado Anschutz Medical Campus for graduate school. He knew that he really enjoyed studying the gut but wanted to see what other parts of the nervous system might interest him. He chose a laboratory that studied cells in the nose called solitary chemoreceptor cells and how they interact with trigeminal neurons that synapse with them. While he found the research interesting, Gulbransen knew that he wanted to find a postdoctoral position in enteric neu-

rosience. Around this time, there was a lot of discussion about the idea of glial cells influencing neural circuits and he knew he wanted to look into this field further. Gulbransen chose a postdoctoral position with Dr. Keith Sharkey at the University of Calgary, Hotchkiss Brain Institute, and that is where he became interested in studying enteric glia and neuron-glia interactions in the gut.

After meeting MSU’s Jim Galligan at a Digestive Disease Week meeting, Gulbransen applied for an open faculty position in the newly formed neuroscience program on campus. He joined the faculty at MSU in 2012 and has found MSU to be a good supportive home to get started as a researcher. Today, Gulbransen’s research revolves around the enteric nervous system and the gut. The enteric nervous system is remarkably independent - intestines could carry out many of their regular duties even if they somehow became disconnected from the central nervous system. And the number of specialized nervous system cells, namely neurons and glia, that live in a person’s gut is roughly equivalent to the number found in a cat’s brain. “It’s like this second brain in our gut,” Gulbransen said. “It’s an extensive network of neurons and glia that line our intestines.” Neurons are the more familiar cell type, famously conducting

the nervous system’s electrical signals. Glia, on the other hand, are not electrically active, which has made it more challenging for researchers to decipher what these cells do. One of the leading theories was that glial cells provide passive support for neurons. Gulbransen and his team have now shown that glial cells play a much more active role in the enteric nervous system and have shown that glia act in a very precise way to influence the signals carried by neuronal circuits. This discovery could help pave the way for new treatments for intestinal illness that affects as much as 15% of the U.S. population.

The other big aspect of Gulbransen’s research is understanding how glia are affected by inflammation and how they contribute to synaptic plasticity and changes in neurons and the immune cells in gut disease. A large part of what his team does is focused on inflammation models and how glia are affected by inflammation, how they contribute to inflammation and how that might contribute to long term changes in gut function.

The future of Gulbransen’s research will focus on understanding the reason for two main symptoms of irritable bowel syndrome - changes in gut motor function and changes in pain levels. Gulbransen and his team believe glia play key roles in both of these processes.

Gulbransen has a strong interest in mentoring, stemming from his successful experiences as a mentee himself. At the moment his laboratory includes one postdoctoral student and two Ph.D. students, as well as two undergraduate research assistants and one high school student. His students have come from a variety of different programs and interests and many of them are dual degree or dual major students. Gulbransen has enjoyed being able to guide students through the process of becoming a scientific researcher conducting their own experiments. “It’s almost like being a parent - to see these students grow up, progress in their skills and go on to the next steps in their careers - see what they’re able to do out in the world,” commented Gulbransen. “It’s been very rewarding.” 🍷



John LaPres

Professor, Biochemistry & Molecular Biology

Since college, Dr. John LaPres has mostly viewed research as a way to spend time doing what he loves – putting puzzles together. The field of science was a way to put puzzles together to provide a meaningful impact on human health and when LaPres realized he could turn that into a profession he could love, he knew he wanted to pursue a career in research.

LaPres began his college career at the University of Michigan as an undergraduate chemistry major. While he enjoyed the research, he found it to be too abstract with no immediate real-life application. LaPres went on to pursue his secondary teaching certificate, also at U of M, because he had always really enjoyed teaching and connecting with students. He eventually realized, after many draining days of lecturing, that the perfect combination of teaching and research was his career sweet spot and he decided to pursue his Ph.D. at Northwestern University in Pharmacology and Toxicology.

After earning his Ph.D. at Northwestern, LaPres accepted a postdoctoral position with Dr. Chris Bradfield, one of the leading researchers in TCDD toxicity, at the McArdle Laboratory for Cancer Research. LaPres has always been drawn to toxicology, which partially stems from his interest in Sherlock Holmes. LaPres viewed Holmes as a toxicologist at heart

– he liked to figure out how chemicals related to a case. “I’ve always believed that in order to be a really good toxicologist you have to be good at biochemistry, cell biology, physiology, etc., so you aren’t ever pigeonholed into being an expert in any one field,” said LaPres. “So I knew I wanted to be a toxicologist, the question I studied was pretty much secondary to that.”

Born and raised in Muskegon, LaPres knew he wanted to come back to Michigan when it came time to look for faculty positions. With both LaPres and his wife Michiganders at heart, coming back to the state they loved was always in the cards for their family. When a position opened up at Michigan State, LaPres took it and he has been here ever since. His first research projects revolved around PAS (named for the first identified members, Per, ARNT and Sim) superfamily of transcription factors. Specifically, he was interested in the role of hypoxia inducible factors 1 α (HIF1 α) in metal-induced toxicity. He also delved into research on the aryl hydrocarbon receptor (AHR) and the role they play in modulating the toxicity of dioxins. Today, LaPres’ laboratory is trying to identify novel proteins and signaling cascades that might influence these two transcription factors and therefore, control their ability to mediate normal biological responses and aberrant

signaling leading to toxicity. The laboratory uses a wide range of experimental techniques, including proteomic, metabolomic and genomic technology, to gain novel insights into PAS protein signaling mechanisms and to ascertain possible mechanisms for their complex biological responses.

Most recently, LaPres has been working on a Superfund project with Dr. Timothy Zacharewski on the relationship between cholesterol homeostasis and TCDD-induced liver injury. Their research so far suggests that TCDD alters cholesterol biogenesis and this might be an important stepping stone in understanding the ability of TCDD and chemicals like TCDD, to affect liver injury. They believe that AHR is, in part, doing this by manipulating the actual activity and levels of the key enzyme involved in cholesterol biosynthesis, HMGCR, which is the enzyme targeted by the number one prescribed class of drugs in the country, statins. LaPres and Zacharewski’s main goal is to determine if statins impact people’s susceptibility to TCDD-induced liver injury.

As for future research, LaPres would like to explore the endogenous role of AHR. Currently, his current and past research is strongly focused on the exogenous role – how the AHR modulates a cell’s or tissue’s response to exposure of environment toxicants. How that endogenous function is usurped to understand its relationship between the function of the cell, the function of the liver and ultimately how that normal function changes when exposed to something like TCDD is where he would like to explore further.

The relationships and collaborations that LaPres has been able to develop at MSU have kept him here for the long haul. Faculty like Tim Zacharewski, Norb Kaminski and Jack Harkema were mentors to him from the start and essential in LaPres setting up and keeping his research moving forward. Now, LaPres feels grateful to be able to mentor younger faculty in the same way that set his own career out on the right path. As the Graduate Director for the EITS program and the Director of the Bio-Molecular Sciences Graduate Program, LaPres enjoys being able to connect with students while also still running his own successful laboratory research projects.





FACULTY PUBLICATIONS

During the 2020-2021 academic year, IIT affiliated faculty published more than 200 peer-reviewed articles. As a result, the IIT, and MSU research, has been highly visible in prominent peer-reviewed literature. The publications below are from July 1, 2020 to June 30, 2021.

Andrea Amalfitano

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Eran R. Andrechek

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William D. Atchison

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- stem cell motor neurons. *Neurotoxicology*. 81:116-126. PMID: 32991939.
- Jamie J. Bernard**
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Susan L. Ewart

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Patricia E. Ganey

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John L. Goudreau

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Brian D. Gulbransen

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Timothy R. Zacharewski

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FACULTY PROFESSIONAL SERVICE

The affiliated faculty of the IIT participate in many external activities that promote the development of research and science in their chosen field. These activities include editorial boards, review groups or study sections, scientific advisory boards and committees, and officers in scientific societies. The professional service activities below are from July 1, 2020 to June 30, 2021.

Eran Andrechek

- » Editorial Board, Journal of Mammary Gland Biology and Neoplasia
- » Metastasis Research Society Outreach Group I
- » Study Section Member: Swiss National Science Foundation, NY State Rowley Grant Reviewer, DoD Study Section, Swiss National Science Foundation Review, NCI PAR Special Emphasis Study Section, NIH TCB Study Section (Ad Hoc), NIH ZRG1 BMCT-CI Study Section (Ad Hoc)

Jamie J. Bernard

- » Councilor, Carcinogenesis Specialty Section, Society of Toxicology
- » Future Tox VI Organizing Committee, Society of Toxicology

Alison I. Bernstein

- » Reviewer: Physiology and Behavior, BMC Genomics, Journal of Neuro-pathology & Experimental Neurology, Frontiers in Neurology, Frontiers in Neuroscience
- » Secretary/Treasurer, Neurotoxicol-

ogy Specialty Section, Society of Toxicology, 2020-2022 term

- » Guest Editor, Frontiers in Genetics

Sudin Bhattacharya

- » Editorial Board member, Scientific Reports

Leslie D. Bourquin

- » Chair, NSF International Global Food Safety Advisory Council
- » Consumer Goods Forum, Global Food Safety Initiative - GFSI Techni-

- cal Committee Member, Co-Chair of Global Markets Primary Production Technical Working Group
- » Technical Advisory Network Member, Food Safety Preventive Controls Alliance
- » Editorial Board, Foods Journal

Stephen A. Boyd

- » Consultant, Michigan Farm Bureau (regarding PCB uptake by soybeans)
- » Member and Past Chair, Technical Assistance Group, Pine River Superfund Citizen Task Force (Velsicol Superfund Site)
- » Consulting Editor, Soil Science

Steven J. Bursian

- » Member, Health Advisory Board of NSF International

Lyle D. Burgoon

- » Councilor, Ethical, Legal, Forensic, Social Implications Specialty Section, SOT
- » Member of US Delegation to the OECD Working Party on Hazard Assessment and the OECD Extended Advisory Group on Molecular Screening and Toxicogenomics
- » DoD Representative, Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM)

Courtney C. Carignan

- » Chair, Mentoring Committee for the International Society of Exposure Science
- » Organizing Committee, Third National Conference on Per- and Polyfluoroalkyl Substances
- » Scientific Advisor, ATSDR Community Assistance Panel for Pease Tradeport
- » Environmental Health Research and Surveillance Guidance Panel for the Michigan Department of Health and Human Services
- » CVM Committee on Graduate Study and Research
- » MSU Center for PFAS Research, Research and Funding Task Force

- » Environmental Science and Policy Program Advisory Council
- » Emerging Issues Committee, Center for Research on Ingredient Safety
- » Reproductive and Developmental Science Program, Trainer
- » Food Science Curriculum Committee for the Department of Food Science and Human Nutrition
- » Inclusion and Multicultural Committee for the Department of Pharmacology and Toxicology
- » Ad-hoc reviewer for Environmental Health Perspectives, Journal of Exposure Science and Environmental Epidemiology, Environment International, and Environmental Science and Technology.

Karen Chou

- » Science Advisory Board, Chemical Assessment Advisory Committee, U.S. Environmental Protection Agency
- » Invited consultation on EPA's proposed New Approach Methods and Reducing the Use of Laboratory Animals for Chronic and Carcinogenicity Testing
- » Invited consultation on EPA's proposed approach for developing a Consolidated Human Toxicity Risk Assessment Guideline
- » Reviewer of U.S. EPA's draft document, Human Health Toxicity Values for Perfluorobutane Sulfonic Acid (CASRN 375 73 5) and Related Compound Potassium Perfluorobutane Sulfonate (CASRN 29420 49 3)
- » Toxicity and exposure assessment and management strategies for Michigan grape growers and wine makers

Bryan L. Copple

- » Study section member, Hepatobiliary Pathophysiology (HBPP)

Andrea I. Doseff

- » Director, Molecular, Cellular, and Integrative Physiology Graduate Program
- » Director, Post-baccalaureate Graduate Program SiGuE (Success in

Graduate Education)

- » Associate Editor, Journal of Pharmacology and Therapeutics
- » Associate Editor Journal of Medicinally Active Plants
- » Advisory Board NIH-T32 Plant and Sustainability Training Grant, Michigan State University
- » Co-Chair, American Heart Association Study Section
- » National Institute of Health, Study Section Immunology and Immunotherapy
- » Member, National Science Foundation
- » Service at MSU: Council on Diversity and Community (CDC), College of Natural Sciences, CNS Graduate Education Strategic Plan Committee, Graduate School Strategic Plan, Graduate School Mentoring Task Force
- » Organizer member of the 10th American Council for Medicinally Active Plants (ACMAP) Meeting. Rutgers, New Jersey

Susan L. Ewart

- » National Institutes of Health; Allergy, Immunology, and Transplantation Research Committee 2020/210 (AITC) reviewer, February 2021

Patricia E. Ganey

- » Editorial Board, Journal of Toxicology and Environmental Health
- » Editorial Board, Toxicology
- » Councilor, International Union of Toxicologists for the SOT

Jay I. Goodman

- » Fellow, Academy of Toxicological Sciences

Brian D. Gulbransen

- » Rome V, Neurogastroenterology Basic Science Chapter Committee Member
- » Member, Planning Committee, American Neurogastroenterology and Motility Society (ANMS) 2022 Virtual Scientific Webinar Series
- » Curator, DocMatters online community, American Neurogastroenterol-

- ogy and Motility Society (ANMS)
- » Member, Scientific Planning Committee, American Neurogastroenterology and Motility Society (ANMS),
- » Reviewer, American Neurogastroenterology and Motility Society (ANMS) 2021 Annual Meeting
- » Member, American Physiological Society GI & Liver Section Awards Committee
- » Moderator, Digestive Disease Week 2021
- » Associate Editor, Purinergic Signaling
- » NIH, Regular Member, NIDDK DDK-C panel – Career development awards
- » Crohn's and Colitis Foundation National Scientific Advisory Committee (NSAC), Research Awards Committee
- » ANMS Small Grant Program Reviewer

Jack R. Harkema

- » Chair, American Thoracic Society's Environmental Health Policy Committee, 2020 – 2022

Syed A. Hashsham

- » Member, ASTM International Committee on Determining the Effects of Biogenic Sulfuric Acid on Concrete Pipe and Structures (C13.03)
- » Reviewer for multiple study sections of NIEHS K99/R00 and NIEHS ONES applications

A. Wallace Hayes

- » Member, SOT/FDA Colloquium Organizing Committee. Society of Toxicology/Food and Drug Administration
- » Member, SOT/FDA Colloquium Organizing Committee. Society of Toxicology/Food and Drug Administration
- » Member, Next Gen Food Toxicology project. U.S. Food and Drug Administration

Colleen C. Hegg

- » Reviewer, NIH NIDCD Fellowship

Application review

- » Co-Chair, Judging, College of Veterinary Medicine Phi Zeta Research Day
- » Director, Comparative Medicine and Integrative Biology Graduate Program

James E. Jackson

- » Member, American Chemical Society
- » Member, National Academy of Inventors
- » Member (and past chair), Meridian Township Environmental Commission
- » Vice Chair, Brownfield Redevelopment Authority, Meridian Township, MI

A. Daniel Jones

- » Review Editor, Frontiers in Plant Metabolism and Chemodiversity
- » Secretary and Executive Board member, Metabolomics Association of North America
- » Scientific Advisory Panel, Michigan PFAS Action Response Team, State of Michigan

Norbert E. Kaminski

- » External Review Committee for the Interdisciplinary Graduate Program in Toxicology at Texas A&M University
- » Member, National Academy of Sciences, Committee on the Use of Emerging Science for Environmental Health Decisions
- » Member, Joint Committee for NSF/ANSI Standard 500 GRAS-PAS Ingredient Review
- » Member, Board of Directors, Toxicology Forum
- » Editorial Board, Toxicology
- » Member, Food Chemical Safety Committee, ILSI North America

John B. Kaneene

- » Chairperson of the Zoonotic Tuberculosis sub-section of International Union Against TB and Lung Diseases
- » Member, State of Michigan Tuberculosis Committee

- » Member, All University Committee on Promotion and Tenure, MSU
- » Member, College Advisory Committee of the College of Veterinary Medicine
- » Member, Management Committee of the Tanzania Partnership Program, MSU
- » Member, Board of the Public Health Program, College of Human medicine, MSU
- » Member, Department of Large Animal Clinical Services' Promotion and Tenure Committee
- » Member, Department of Large Animal Clinical Services' Advisory Committee

Peer W.F. Karmaus

- » Immunotoxicology Specialty Section, Program Committee, Society of Toxicology
- » Ad hoc Reviewer, iScience
- » Ad hoc Reviewer, PLOS Pathogens
- » Review Editor, Frontiers in Immunology

John J. LaPres

- » Associate Editor, Toxicology Reports
- » Grant Reviewer, Congressionally Directed Medical Research Programs

Kin Sing Stephen Lee

- » Reviewer: Journal of Medicinal Chemistry, Journal of Fluorine Chemistry, ChemMedChem, ACS Neuroscience

Gina M. Leininger

- » Ad hoc Reviewer: Diabetes, Journal of Neuroscience, Nature Communications, Nature Medicine, Neuropeptides, Neuropharmacology, Scientific Reports
- » Society Service: The Obesity Society Annual Program Committee, The Society for the Study of Ingestive Behaviors Program Committee
- » Abstract Reviewer: The Endocrine Society, The Obesity Society, The American Diabetes Association, The Society for the Study of Ingestive Behaviors

- » Grant Reviewer: NIDDK Fellowships Panel, IPOD (ad hoc reviewer)
- » Editorial Board, Neuropeptides

Hui Li

- » Guest Editor, Special Issue of Organic Contaminants in Agro-Environment for Chemosphere
- » Leader of Animal Agriculture and Environmental Quality Community, American Society of Agronomy
- » Fellow, American Society of Agronomy

Karen T. Liby

- » Editorial Board, AACR Cancer Prevention Research
- » Editorial Board, Scientific Reports
- » Editorial Board, Carcinogenesis
- » Member, PREVENT Program Scientific Review Panel
- » Member, AACR Cancer Epidemiology and Prevention Award Committee
- » Member, AACR Cancer Prevention Steering Committee
- » Member, Education Committee for the AACR Annual Meeting
- » Member, DOD Lung Cancer Research Program Review Panel
- » Reviewer, NCI R21/R03 Clinical and Translational Exploratory/Developmental Studies
- » Reviewer, NCI Investigator-Initiated Program Project (P01) review
- » Reviewer, NIH F30/F31/F31 Fellowship Review Panel: Oncological Sciences
- » Reviewer, NIH Preclinical Toxicology Technical Evaluation Panel
- » Reviewer, Breast Cancer Now Preclinical Catalyst Proposals
- » Reviewer, NIH Cancer Immunopathology and Immunotherapy Panel

James P. Luyendyk

- » Standing member, XNDA Study Section
- » Chair, SOT Committee for Diversity Initiatives
- » Senior Councilor, Mechanisms Specialty Section, Society of Toxicology

- » Editorial Board, Journal of Thrombosis and Haemostasis
- » Editorial Board, Toxicological Sciences

Linda S. Mansfield

- » Appointed as Albert C. and Lois E. Dehn Endowed Chair
- » Study Section Member, National Institutes of Health, National Institute of Allergy and Infectious Diseases Branch, Standing NIH Study Section, Immunity and Host Defense Study Section (IHD), Scott Jakes SRO
- » Member: Society for Mucosal Immunology, American Society for Microbiology, Conference of Research Workers in Animal Diseases, American Associations of Veterinary Immunologists, World Association for the Advancement of Parasitology, American Association for the Advancement of Science, American Veterinary Medical Association, Michigan Veterinary Medical Association, American Association of Veterinary Parasitologists

Michelle S. Mazei-Robison

- » American College of Neuropsychopharmacology (ACNP) Women's Task Force
- » ACNP Liaison Committee
- » ASPET Division for Neuropharmacology Program Committee
- » ASPET Division for Neuropharmacology Executive Committee
- » Catecholamine Society, Councilor
- » NIH study section: ETTN-B (55), Large scale mapping and/or molecular profiling of ensembles and/or cell types mediating opioid action in the rodent brain, Feb 2021
- » Scientific Reports, Editorial Board

Laura R. McCabe

- » Women in Bone and Mineral Research Committee, American Society of Bone and Mineral Research
- » FASEB Science Policy Committee, FASEB
- » Grant Program Council and Operat-

ing Committee For Cores, Michigan Diabetes Research and Training Center/Translational Research

- » Faculty Steering Committee and FDP Executive Committee, Federal Demonstration Partnership
- » Chair, Science Policy Committee, American Physiological Society
- » Animal Care and Experimentation Committee, American Physiological Society
- » SPC Chair Member, Council, American Physiological Society
- » Associate Editor, Journal of Cellular Biochemistry, Molecular Biology Reports, World Journal of Diabetes
- » Editorial Board, Physiological Reviews

Ilce G. Medina Meza

- » Editorial Board, Food Research International

Masako Morishita

- » Abstract Reviewer. American Public Health Association: 2021 Annual Meeting and Expo
- » Editorial Board. Toxics

Cheryl A. Murphy

- » Steering Committee, High-Throughput Screening and Environmental Risk Assessment, SETAC North America
- » Associate Editor, Ecotoxicology
- » Reviewer for the NRC Research Associateship Programs (RAP) review panel
- » Wisconsin Sea Grant Preproposal and Full Proposal Panel Review Member
- » Reviewed Proposal for Center of Excellence sponsored by the European Science Foundation
- » Society for Environmental Toxicology, North America, Professional Awards Committee

Nigel S. Paneth

- » Leadership team, National Convalescent Plasma Project (CCPPI9.org)
- » Board of Directors, Michigan

- Neonatal Biobank, (representing Michigan State University)
- » Co-Chair (with David Savitz, Brown University) State of Michigan Environmental Health Research and Surveillance Guidance Panel
- » Scientific Advisory Group, Norwegian Mother and Child Cohort (MoBa) and Danish National Birth Cohort (DNCB) combined cerebral palsy study (MOBAND)
- » External Advisor, Screening to Improve Health in Very Premature Infants in Europe (SHIPS) Study, INSERM, Paris, funded by European Commission
- » Editorial Board, Journal of Developmental Medicine and Child Neurology
- » 2021 Distinguished Career Achievement Award, Geisel School of Medicine, Dartmouth

A.J. Robison

- » NIH Study Section Member, Brain Disorders and Clinical Neuroscience
- » NIH Study Section Member, Brain Disorders and Clinical Neuroscience
- » Grant Reviewer: Israel Science Foundation, Joint NSFC-ISF Research Proposals
- » Committee Member, American College of Neuropsychopharmacology Public Information Committee

Cheryl E. Rockwell

- » Editorial Board, Molecular Pharmacology
- » Editorial Board, Pharmacological Research
- » Associate Editor, BMC Pharmacology & Toxicology
- » Ad hoc member, Systemic Injury by Environmental Exposure Study Section
- » Ad hoc member, Hypersensitivity, Allergy and Mucosal Immunology Study Section
- » Ad hoc member, Lung Cellular, Molecular, and Immunobiology Study Section
- » President-elect, Michigan Society of Toxicology

- » Vice President-elect, Mechanisms Specialty Section, SOT
- » Secretary/Treasurer-Elect, Toxicology Division, ASPET

Kenneth D. Rosenman

- » Co-Leader, Occupational Health Work Group, Conference of State and Territorial Epidemiologists
- » Secretary, Board of Directors of the Michigan Occupational and Environmental Medical Association
- » Member, Michigan Pesticide Advisory Committee

Robert A. Roth

- » Editorial Board, Journal of Toxicology and Environmental Health
- » External Advisory Committee, Curriculum in Toxicology, University of North Carolina at Chapel Hill
- » External Advisory Committee, Graduate Program in Pharmacology, University of Kansas Medical Center

J. Craig Rowlands

- » Member, US EPA Science Advisory Committee on Chemicals (SACC)
- » Member, US EPA TSCA PBT Panel
- » Member, Board of Directors, Johns Hopkins University, Center for Alternatives to Animal Testing (CAAT)

Rita S. Strakovsky

- » Ad-hoc grant reviewer, NIEHS Career Development & Pathway to Independence in Biomedical/Clinical Research Study Section
- » Ad-hoc grant reviewer, NIH ECHO (Environmental Influences on Child Health Outcomes) Opportunities and Infrastructure Fund
- » Editorial board member, Endocrine and Metabolic Science
- » Publication committee, American Society for Nutrition
- » President Elect, Michigan Regional Chapter of the Society of Toxicology

Neera Tewari-Singh

- » Editorial Boards: Cutaneous and Ocular Toxicology, Francis and Tay-

lor Journal, Toxicology Mechanisms and Methods, Taylor and Francis Journal

- » Committee on Research and Graduate Studies for the College of Osteopathic Medicine, Michigan State University
- » Course & Curriculum Committee, Department of Pharmacology and Toxicology, Michigan State University
- » Communications Committee, Department of Pharmacology and Toxicology, Michigan State University
- » Faculty Advisory Committee, Department of Pharmacology and Toxicology, Michigan State University
- » 2019-2021-Treasurer, Ocular Toxicology Specialty Section, Society of Toxicology

James M. Tiedje

- » Bioscience External Science Advisory Committee, Berkeley National Laboratory
- » Science Advisory Committee, Denmark's CENPERM (Cntr for Permafrost change in Greenland) Projects
- » Member, Science Advisory Comm for Consortium for Monitoring, Technology, and Verification (Nuclear Non-proliferation)
- » Member, Simons Foundation Bioscience Advisory Committee
- » Steering Committee Member, NMDC (Natl Microbiome Data Collaborative)
- » Member, NASEM Workshop on Exploring a Dynamic Soil Information System (DySIS)
- » Advisory Committee, for DOE's PNNL Soil Microbiome Project, and LBNL's EcoFAB Steering Comm
- » American Society of Microbiology's Representative, US Nagoya Protocol Action Group (USANPAG)
- » American Academy of Microbiology, Chair of Colloquium Committee on Microbes and Climate Change
- » Advisory Committee, Kansas's NSF Microbiome EPSCoR Project
- » Scientific Advisor, Resistomap, a Finnish antimicrobial resistance

monitoring company

- » Member, NEON's Microbial Technical Working Group

James E. Trosko

- » Editorial Board, Diseases
- » Member, Advisory Board to the MSU-COM Institute for Global Health
- » Scientific Advisory Board Member, Adult Stem Cell Research Company
- » Reviewer for multiple scientific journals and grant reviews for international granting agencies (Italy, Brazil, Korea, Czech Republic, France)
- » Consultant to Dr. Mari Dezawa, Director of Human Stem Cell Research, Tohoku University, Sendai, Japan

Bruce D. Uhal

- » Member, College of External Reviewers, European Science Foundation
- » Editorial Board Member, Frontiers in Pediatrics

Brad L. Upham

- » Associate Editor, Journal of Toxicology
- » Associate Editor, BioMed Research International
- » Associate Editor, Biomedicines
- » Chair, Education Committee, Society of In Vitro Biology
- » Co-Chair, Great Lakes Pediatrics Research Day Planning Committee

James G. Wagner

- » Associate Editor, Inhalation Toxicology
- » Editorial Board, Particle and Fibre Toxicology
- » Member, Committee for Threshold Limit Values for Chemical Substances (TLV-CS); American Conference of Governmental Industrial Hygienists (ACGIH)
- » NIH Reviewer, ZRGI F-18A (20), Fellowships, Epidemiology and Population Sciences (F18)
- » NIH/NIAID Reviewer, ZAI1-KJK-I-J1; ZAI1-KJK-I-J2; Childhood Asthma in Urban Settings - Clinical Leadership and Research Centers (U01 and UMI)

- » CDC/NIOSH Reviewer, ZOH1 NXT (52), Disease, Disability and Injury Prevention and Control Special Emphasis Panel -World Trade Center Health Program (U01)

Felicia Wu

- » Expert Advisor, Joint Expert Committee on Food Additives (JECFA) of the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization
- » Member, FAO Livestock Nutrition and Food Security Scientific Advisory Committee
- » Board Member, International Consortium for Applied Bioeconomy Research (ICABR)
- » External Advisory Board Member, Food Systems Institute, University of Florida
- » Area Editor, Risk Analysis
- » Section Editor, World Mycotoxin Journal
- » Editorial Board, Archives of Environmental and Occupational Health
- » Member, MSU Vice President for University Advancement Search Committee
- » Member, Department Advisory Committee, Food Science and Human Nutrition
- » Member, Awards Committee, Department of Agricultural, Food, and Resource Economics

Timothy R. Zacharewski

- » Editorial Board, Toxicological Sciences
- » Editorial Board, Toxicology & Applied Pharmacology
- » Ad-Hoc Committee Member, National Institutes of Health - Special Emphasis Panel
- » Ad-Hoc Committee Member, Health Canada
- » Ad-Hoc Committee Member, Canadian Institutes for Health Research
- » Ad-Hoc Committee Member, The French National Research Agency (ANR)

Wei Zhang

- » Associate Editor, Canadian Journal of Soil Science, Journal of Environmental Quality
- » Guest Editor, Vadose Zone Journal
- » Chair, SSSA Soil Physics and Hydrology Division Mentoring Committee
- » Committee Member, AGU Unsaturated Zone Technical Committee, ASABE NRES-21 Hydrology Group
- » Member of Multistate Research Project W3188: Soil, Water, and Environmental Physics Across Scales
- » Member of Multistate Research Project NC1187: The Chemical and Physical Nature of Particulate Matter Affecting Air, Water and Soil Quality
- » Secretary General, International Symposium on Agro-Environmental Quality, Nanjing, China

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Norbert E. Kaminski, Director, Institute for Integrative Toxicology; Director, Center for Research on Ingredient Safety; Professor, Pharmacology & Toxicology, Cell & Molecular Biology

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Peer W.F. Karmaus, Adjunct Assistant Professor, Institute for Integrative Toxicology, Staff Scientist, NIEHS

John J. LaPres, Professor, Biochemistry & Molecular Biology; Graduate Program Director, Institute for Integrative Toxicology

Kin Sing Stephen Lee, Assistant Professor, Pharmacology & Toxicology

Gina M. Leininger, Associate Professor, Physiology, Neuroscience Program

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Jane F. Maddox, Assistant Professor, Pharmacology & Toxicology

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Linda S. Mansfield, University Distinguished Professor, Large Animal Clinical Sciences, Microbiology & Molecular Genetics

Michelle Mazei-Robison, Associate Professor, Physiology, Neuroscience Program

Laura R. McCabe, MSU Foundation Professor, Physiology

J. Justin McCormick, University Distinguished Professor, Microbiology & Molecular Genetics, Biochemistry & Molecular Biology

Ilce G. Medina Meza, Assistant Professor, Biosystems and Agricultural Engineering

Masako Morishita, Associate Professor, Family Medicine

Thomas P. Mullaney, Professor Emeritus, Pathobiology & Diagnostic Investigation

Cheryl A. Murphy, Associate Professor, Fisheries & Wildlife

Rance Nault, Assistant Professor, Biochemistry & Molecular Biology

Lawrence Karl Olson, Associate Professor, Physiology

Nigel S. Paneth, University Distinguished Professor Emeritus, Epidemiology, Pediatrics

James J. Pestka, University Distinguished Professor, Microbiology & Molecular Genetics, Food Science & Human Nutrition

Brian K. Petroff, Associate Professor, MSU Veterinary Diagnostic Laboratory, Pathobiology & Diagnostic Investigation

A.J. Robison, Associate Professor, Physiology, Neuroscience Program

Cheryl E. Rockwell, Associate Professor, Pharmacology & Toxicology

Kenneth D. Rosenman, Professor, Medicine

Robert A. Roth, Professor Emeritus, Pharmacology & Toxicology

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Toxicology, Senior Scientist, Underwriters Laboratories, LLC

James G. Sikarskie, Professor Emeritus, Small Animal Clinical Sciences

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Greg M. Swain, Professor, Chemistry

Brian J. Teppen, Professor, Plant, Soil & Microbial Sciences

Neera Tewari-Singh, Assistant Professor, Pharmacology & Toxicology

James M. Tiedje, University Distinguished Professor Emeritus, Plant, Soil & Microbial Sciences, Microbiology & Molecular Genetics

David A. Tonucci, Adjunct Professor, Institute for Integrative Toxicology, Vice President for Regulatory & Toxicology, Artemys Foods

James E. Trosko, Professor Emeritus, Pediatrics & Human Development

Bruce D. Uhal, Professor, Physiology

Brad L. Upham, Associate Professor, Pediatrics & Human Development

Thomas C. Voice, Professor, Civil & Environmental Engineering, Senior Associate Dean, College of Engineering

James G. Wagner, Associate Professor, Pathobiology & Diagnostic Investigation

Michael R. Woolhiser, Adjunct Professor, Institute for Integrative Toxicology, Toxicology & Environmental Research Laboratory Director, The Dow Chemical Company

Felicia Wu, John A. Hannah Distinguished Professor, Food Science & Human Nutrition, Agricultural, Food, & Resource Economics

Timothy R. Zacharewski, Professor, Biochemistry & Molecular Biology

Wei Zhang, Associate Professor, Plant, Soil & Microbial Sciences, Environmental Science & Policy Program

Academic Dept. / Disciplinary Ph.D. Programs

(Participate in the IIT's EITS graduate program.)

- » Animal Science
- » Biochemistry & Molecular Biology
- » Cell & Molecular Biology
- » Chemistry
- » Comparative Medicine & Integrative Biology
- » Earth & Environmental Sciences
- » Fisheries & Wildlife
- » Food Science & Human Nutrition
- » Forestry
- » Genetics & Genome Sciences
- » Integrative Biology
- » Microbiology & Molecular Genetics
- » Neuroscience
- » Pharmacology & Toxicology
- » Physiology
- » Plant, Soil, & Microbial Sciences

Deans

- Birgit Puschner**, College of Veterinary Medicine
- Kelly Millenbah**, College of Agriculture and Natural Resources
- Leo Kempel**, College of Engineering
- Aron Sousa**, College of Human Medicine
- Andrea Amalfitano**, College of Osteopathic Medicine
- Phillip Duxbury**, College of Natural Science
- George W. Smith**, Director, AgBioResearch



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