RUTGERS

Lipman Log

Department of Biochemistry and Microbiology

2021-2022

Greetings from the Chair

Department Chair, Max Häggblom

Greetings from Lipman Hall,

Yes, we are back, in person! While we continue to face challenges of the COVID-19 pandemic, after more than two years of connecting by Zoom we are now back in person, at least in part. Most of our campus activities have indeed returned, including lecture classes, labs, and seminars.

This has indeed been an unprecedented time for all of us as we have learned to navigate this unchartered territory. This current issue of the Lipman Log highlights some of our activities from the 2020-2021 and 2021-2022 academic years. We have celebrated several newly minted Ph.D.'s, exciting new research projects and awards, as well as major advances and publications in the different areas of our scholarship. With the experience of teaching and research in the pandemic, we are adjusting to the "new normal" and you can read about our experience in teaching in a pandemic and how this has affected both lecture and lab courses.

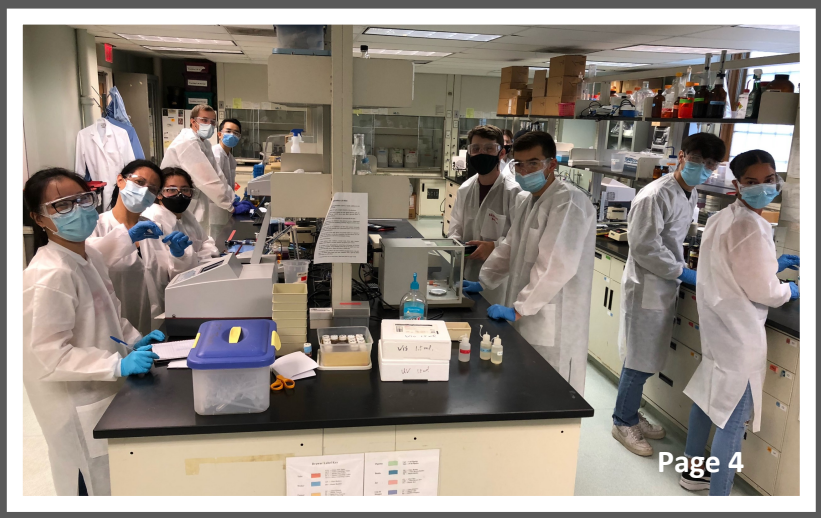
We welcome our two new Teaching Instructors who joined our faculty: Dr. Kessler McCoy-Simandle and Dr. Karla Esquilín-Lebron. Kessler is taking the lead for the General Biochemistry course while Karla is teaching sections of General Microbiology Lab as well as the Ecology and Diversity Laboratory course. We also welcome Michelle Mac Pherson as our new Department Administrator and the return of Nalini Kaul as Undergraduate Biochemistry Program Coordinator. We will also miss two dear colleagues who retired. Prof. Tamar Barkay retired from the Rutgers faculty in 2021, and, due to pandemic restrictions, gave her retirement seminar "Mercurial life: retirement talk ...onward!" via Zoom. Prof. Peter Kahn retired in 2022 after over four decades of service at Rutgers and his work was celebrated with a symposium in May 2022. To recognize Peter's dedicated teaching and mentoring and the enormous impact that he has had on undergraduate education at Rutgers, we have established the Peter Kahn Endowed Biochemistry Scholarship to support biochemistry undergraduate students.

In this issue we have a remembrance of Dr. Jim Macmillan, Professor Emeritus, who joined the faculty of the College of Agriculture in 1965 and served as Chair of the Department from 1969 to 1979. In alumni news we congratulate Dr. Ron Atlas, who earned his Ph.D. in Microbiology with Prof. Richard Bartha in 1972, on receiving the 2022 Dennis Fenton Distinguished Alumni Award from the Cook Alumni Association.

In 2022 we were delighted to have the Rutgers Microbiology Symposium was back in person. The one-day symposium included faculty talks and student-postdoc presentation from across the Rutgers campuses. A great way to catch up on what is going on. Indeed, it is a delight to follow the achievements of our undergraduate and graduate students who are engaged in many exciting research projects with our faculty members. You can read more on the latest Ph.D. theses, undergraduate researchers in the lab, the awards our students have received and about their other activities. Our department also hosts visiting scholars and students from around the world, so even in a pandemic Lipman Hall continued to buzz.

I wish to thank all our donors that make many of our activities possible. Your contributions provide important student scholarships, awards and travel fellowships, and support our seminars and outreach activities. As pandemic restrictions are lifted, the Eveleigh Graduate Student Travel Awards provide much- needed support for our students to travel to national and international conferences to present their work, network, and learn. We hope that you will continue to show your support for the department and our scholarly programs.

From all of us in the Department of Biochemistry and Microbiology our warm greetings!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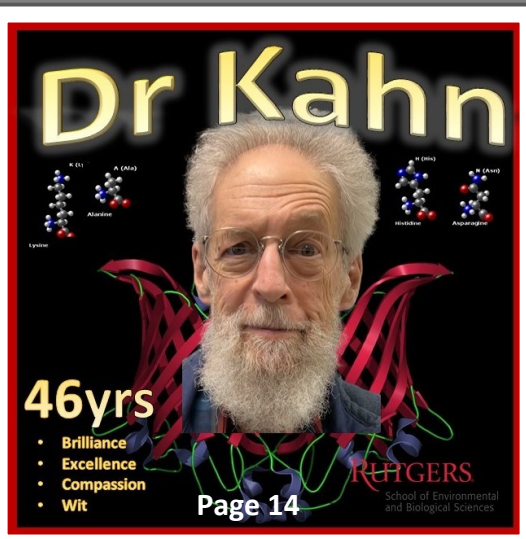

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Inside this issue

Teaching in the Pandemic World

Ines Rauschenbach, Microbiology Undergraduate Program Director

Teaching a large lecture/lab course in person can be demanding each semester, teaching the course remotely during a pandemic added another level of challenge. During the spring semester 2020, we all found ourselves having to adjust our teaching modes within one week's time. We recorded lectures, had remote meetings, and scrambled to complete labs without being present in an actual lab setting. Over the summer, we were able to plan for our new reality – teach general microbiology laboratories online. There is no better time to teach microbiology than during a pandemic, right?

The new labs included creativity and we were planning for the best way to deliver the experience safely and effectively as well as we could. We added McGraw Hill lab simulations to replace the lab work we would be doing in the lab. In addition, we developed a case study/inquiry-based project in which students were asked to prepare a microbial product at home. Students were eager to brew fermented drinks, prepare yogurts, and even hot sauces. Based on this microbial product project, students prepared a proposal, a great skill for students to learn and practice. Based on the enthusiasm of students with these products, we continued this project into the academic year 2020/2021 and are currently working on publishing this teaching module. One of the goals we have for our general microbiology students is to learn about and work with the microscope. We found an exciting product "Foldscope" – a simple paper microscope that is powerful enough to observe eukaryotic microbes. We have now sent over 500 of these scopes to our students and have received many exciting images of environmental microbes.

For our Applied Microbiology course that we teach during the fall semester, we decided to continue face to face instruction. This course is mostly taken by senior level microbiology majors and it was important to us that students gain the hands-on experience and have the opportunity to "apply" their microbiology knowledge. We rearranged the labs and also changed the experiments on our lab schedule to meet the social distancing requirements. One of our favorite labs, beer brewing, unfortunately was not offered but we hope to be back with it this year! Our students were grateful that this lab was taught in-person. The best comment that we received was that "in-person labs allow you to make mistakes and you can trouble shoot. Remote labs and simulations only allow you to go through the experimental process."

As we move forward into a soon "post-pandemic" world, we will be taking much that we learned over the past 1.5 years with us. We learned that we, faculty and students, can adapt quickly and change our mode of delivery in a very short time. We learned to be resourceful and provide an inclusive learning environment for all students. We learned that hands-on labs are best, but we do have to capability to supplement the material with simulations.

And the best…We also learned that we all are a great team and with everyone working together, we can achieve amazing things!

Following COVID-19 distancing guidelines while working in the Microbiology teaching lab.

Sharron Crane, Teaching Instructor

We're back!

After more than two semesters of remote-only instruction, Introductory Biochemistry Laboratory (115:313) is back in-person! We offered one section of this lab over the summer, and are currently running three in-person sections. Because this is a transitional period, we also have two remote sections this semester.

Spring 2020 was tough. We went from in-person to remote instruction in what seemed like the blink of an eye, and students and faculty alike struggled with diverse challenges, both academic and personal, at the beginning of the pandemic. Given that we had over 70 students across five sections our choice was to run the second half of Spring 2020 asynchronously. The situation was not ideal, but we were able to post data and images for the students to analyze (e.g., enzyme kinetics data and pictures of carbohydrate assay results), which allowed us to keep the course aligned with our learning objectives, aside from the fact that students were not able to gain practical experience with the different techniques.

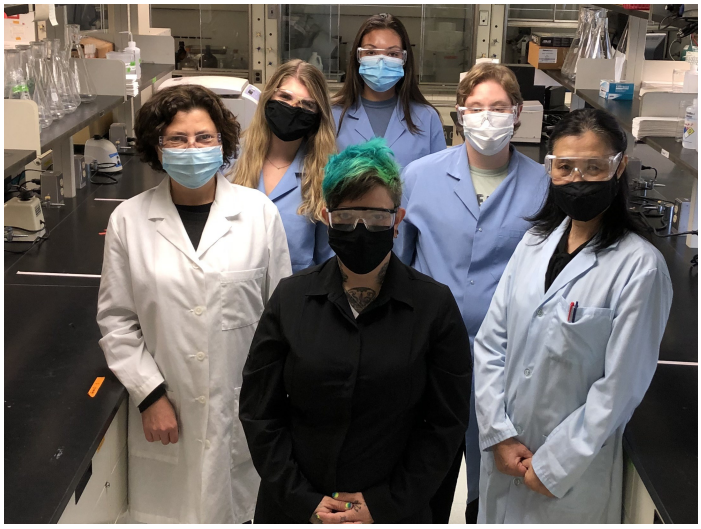
Summer 2020 gave us an opportunity to plan for the Fall 2020, which was entirely remote. We had time to edit and add materials, and to learn how to use the technology that would allow us to "meet" with our students, both for remote, synchronous instruction and for individual meetings. With help from Lucy and Dr. Voloshchuk, we made a few demonstration videos so that students could visualize the lab and understand how to apply different skills (e.g., serial dilution and spectrophotometry), and also had the time to select online resources that could enhance student understanding of the different techniques.

Fall 2020 and Spring 2021 gave us opportunities that we did not anticipate. Of course, we all wished we could be in-person, but because the students were not physically in the lab, they did not seem to experience a lot of the "lab anxiety" that is often palpable in laboratory courses. They were able to focus on understanding of concepts rather than focusing on written instructions, and our discussions of the material were able to delve deeper than during a typical in-person semester.

Now that we are back (hooray!), the teaching team of 115:313 has been working together to update course instruction to get the "best of both worlds." The goal is to further combine the benefits of spending time to discuss the complexity of various techniques and to fully interrogate data / information with those of hands-on experience. Introductory Biochemistry Lab has entered a new era!

Natalya Voloshchuk, Assistant Teaching Professor

It was back in the classroom for 4 sections of experimental biochemistry 11:115:413 in the Fall 2021. After fully online format in the fall 2020, we are happy to be back in the lab!



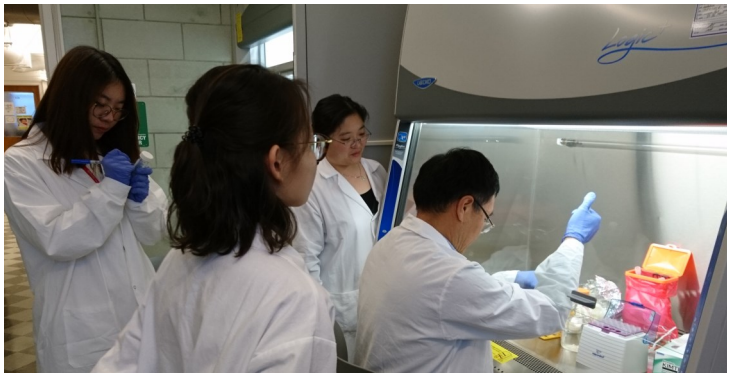
Students in the Biochemistry teaching lab.

Insights from the Zhao Lab on the gut microbiome and COVID-19

Liping Zhao, Professor, Eveleigh-Fenton Chair of Applied Microbiology

When the first paper on clinical phenotypes of COVID-19 patients in Wuhan was published in March 2019, Liping Zhao realized that the gut microbiome may play a very important role in this disease. COVID-19 patients with pre-existing conditions such as obesity and type 2 diabetes suffer a three to four times higher mortality rate than the average patient population. Zhao's previous studies have shown that diabetic or prediabetic patients have opportunistic pathogens overgrowing in their gut. High baseline level of such pathogens may drive the more severe form of COVID-19. Such pathogens can contribute to the cytokine storm and sepsis, which are the major causes of mortality in these high-risk patients. Thus, controlling the gut microbiota in a way that doesn't allow the overgrowth of pathogens in the gut could become a very important component of the care of COVID-19 patients.

Zhao's previous clinical trials showed that a rationally designed microbiome nutrition formula can increase a specific group of beneficial bacteria in the digestive track of those with type 2 diabetes or obesity. Akin to a tall tree in the rainforest, this group of beneficial bacteria can structure and stabilize the healthy gut microbiome. Zhao calls them the "foundation guild" bacteria, because they serve the role of "foundation species" to the gut ecosystem, yet they are not a single species but a group of different species with similar functions that work together as a guild. When foundation guild bacteria were restored, opportunistic pathogens in the gut were reduced to low levels. Zhao decided to take this nutrition formula to treat early COVID-19 patients with pre-existing conditions. While the new treatment does not directly target the coronavirus, Zhao believes that a reduction of these pathogens may lead to decreased levels of inflammation and reduce risk for complications such as bacterial sepsis. This nutrition formula has been given the Investigational New Drug status by the Food and Drug Administration. A phase 2 clinical trial is now underway, which is sponsored by Notitia Biotechnologies Company, a Rutgers startup that Liping Zhao co-founded. This microbiome formula NBT-NM108 is now available for expanded access to patients with COVID-19 long hauler syndrome or other disease indications in which a dysbiotic gut microbiome may play a role.



In Memoriam

Remembering the Life of James Macmillan

James (Jim) Macmillan, Professor Emeritus of Rutgers University died peacefully on April 5, 2022 at his home.

Jim served on the Rutgers faculty for over 30 years, leaving a lasting impact on the field of microbiology and on the students and faculty with whom he worked alongside. Jim was born in Billings, Montana in 1931. He attended Montana State College in Bozeman Montana, earning a BS in Bacteriology in 1952 and a MS in Bacteriology in 1956. He continued graduate work at UC Davis, earning his PhD in Microbiology in 1963, and post-doctoral research as a National Institutes of Health Post- Doctoral Fellow. Jim then joined the faculty of the College of Agriculture (later Cook College and now the School of Environmental and Biological Sciences) at Rutgers University in 1965 as an Assistant Professor of Microbiology in the Department of Biochemistry and Microbiology. He was promoted to Professor in 1971 and served as Chair of the Department from 1969 to 1979. Jim taught graduate and undergraduate classes in microbiology, such as the course Applied Microbiology, and his research focused primarily on enzymes, toxins, and antibodies. He retired from Rutgers in 1997. In 2011, Jim was honored by a former student, Dennis Fenton and his wife Linda Fenton, who gifted a graduate Fellowship in Jim's honor, the James Macmillan Endowed Fellowship in Microbiology.

Jim is survived by his wife, Laura Ann Macmillan (Budwell), and his daughters and granddaughters. He is missed by former students, coworkers and friends.

Our Faculty in Print

A selection of papers published in 2021-2022:

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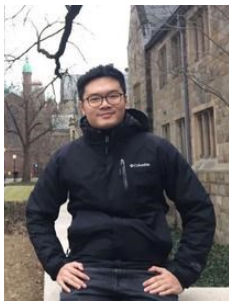
Graduate Research—Ph.D. Theses

Tiffany S. Louie
Graduate Program: Microbial Biology PhD 2021
Advisor: Max Haggblom
Anaerobic Molybdenum-Cofactor–Utilizing Bacteria: Genomic Insights into Anaerobic Respiration and Anaerobic (Halo)Benzoate Degradation

Bacteria can harvest energy from a range of carbon sources from simple to complex, and couple this to the anaerobic respiration of different terminal electron acceptors. Bacterial metabolism has a major impact on the biogeochemical cycling of the elements involved. The objective of this dissertation, was to investigate the genetic code behind the diverse metabolic capabilities of three different anaerobic bacteria — *Sedimenticola selenatireducens* AK4OH1, *Thauera chlorobenzoica* 3CB-1, and *Seleniivibrio woodruffii* S4 — specifically those encoding the enzymes involved in the degradation of aromatic compounds and molybdenum-containing enzymes (molybdoenzymes) involved in oxidation-reduction reactions. The anaerobic degradation of aromatic compounds often involves coenzyme A (CoA) ligases to form the electron-withdrawing CoA-thioester group on the aromatic ring to prepare the aromatic system for reduction by CoA reductases. The genomic analyses revealed the CoA ligase and CoA reductase genes encoded within *S. selenatireducens* AK4OH1 and *T. chlorobenzoica* 3CB-1, both of which are capable of anaerobic mineralization of different benzoic acids derivatives. Anaerobic respiration with terminal electron acceptors such as nitrate, selenate, and arsenate, is catalyzed by molybdoenzymes that are part of the dimethylsulfoxide reductase (DMSOR) family. All three bacteria described here utilize DMSORs for their anaerobic respiration, and this was evidenced in their genomes.



Zishuo Zeng
Graduate Program: Institute for Quantitative Biomedicine PhD 2022
Advisor: Yana Bromberg
Decoding The Effects of Synonymous Variants in Human Genome

Synonymous single nucleotide variants (sSNVs), a common type of genomic variant, does not alter the protein sequence but can have a variety of functional impacts. Integrating sSNVs into complex disease prediction and precision medicine is very difficult—mostly due to the lack of a reliable computational tool to evaluate the effects of sSNVs. Here, to bypass the bottlenecks that most relevant predictors suffer from (i.e. limited size and reliability of training data), we inferred groups of neutral and effect sSNVs based on large-scale variant data from population sequencing cohorts. We then built a novel machine learning-based predictor, synVep (synonymous Variant effect predictor), to evaluate whether a given sSNV has molecular functional effect. Validation on multiple experimental datasets demonstrated synVep's good performance and suggested the promising utility of synVep in disease prediction. In a separate investigation, we found that incorporating synVep with conservation and variant frequency allowed better identification of cancer genes and cancer driver variants. We then, using synVep and other annotations, proposed a list of sSNVs that are potentially cancer driving variants. These results may help interpretation and prioritization on sSNVs in the context of cancer research.

Microbial Biology Graduates

Name	Advisor	Department	Degree
Ananya Agarwal	Falkowski	Marine Sci	Ph.D.
Rachel Dean	Fennell	Env Sci	Ph.D.
Kevin Dillon	Fennell	Env Sci	Ph.D.
Ishita Jain	Severinov	MBB	Ph.D.
Alexander Cai	Dominguez Bello	B&M	M.S.
Belle Huang	Zhou	B&M	M.S.
Jessica Mason	Reinfelder	Env Sci	M.S.
Elena Sacco	Ebright	Chem	M.S.
Nikita Thakur	Kerkhof	Marine Sci	M.S.
Ciarra Williams	Dominguez	B&M	M.S.
Pengpeng Wu	Ebright	Chem	M.S.
Luke Yarter	Campbell	Ex Sci	M.S.

Awards

Students

Graduate students

School of Graduate Studies Excellence in Outreach and Service Award: Ciarra Williams (2022)

Robert S. and Eileen A. Robison Scholarship Award for Excellence in Graduate Studies:
Amada Williams and Igor Ivanovski (2020), Gina Moreno and Ying-Elsa Wang (2021)

Undergraduate Students

Selman A. Waksman Award - 2022: Max Dvinskikh | **2021:** Matthew Estrella, Hannah Canonigo

Strumeyer Award - 2022: Preet Patel |**2021:** George Echeverria

Chase Award - 2022: Ethan Blackand Nirali Trivedi | **2021:** Michael Langevin, Sheron Mehak, Bhavya Shah, Amanda Liyanaarachchi

Department of Biochemistry and Microbiology Diversity Fellowship Award - 2022: Max Dvinskikh

Faculty

Maria Gloria Dominguez-Bello was the recipient of the 2021 SEBS Research Excellence Award

Ines Rauschenbach was the recipient of the 2021 SEBS Teaching Excellence Award and the Presidential Award for Excellence in Teaching

Charles Dismukes was the recipient of the 2021 Chancellor's Award for Pioneering Research.

Max Häggblom was recognized with Federation of European Microbiological Societies Special Merit Award in 2021.

Yana Bromberg was Elected Vice President of the International society for Computational Biology (ISCB).

Alumni

Ron Atlas Receives Dennis Fenton Distinguished Alumni Award

Dr. Ron Atlas received the 2022 Dennis Fenton Distinguished alumni award from the Cook Alumni Association. Prof. Atlas is an internationally recognized scholar, educator and advocate for science. After earning his Ph.D. in Microbiology at Rutgers with Prof. Richard Bartha, he was a Research Associate at the Jet Propulsion Lab, California Institute Technology (1972-1973), before joining the faculty at University of Louisville in the Department of Biology (in 1973 until his retirement). His achievements include pioneering research in microbial degradation of hydrocarbons and other organic pollutants, numerical taxonomy of marine bacteria, effects of pesticides and other organic compounds on microorganisms, and ecology of soil and marine microorganisms. He played a leading role in the development and application of a special bacterial fertilizer that helped in the cleanup of the Exxon Valdez oil spill. He is author of nearly 300 papers on topics ranging from the cleanup of oil spills to infectious diseases and bioterrorism. He has authored 20 books, several of which have been classic textbooks used around the world, including Microbial Ecology (by Atlas and Bartha) and Microbiology: Fundamentals and Applications. Ron Atlas is past chair of the American Society for Microbiology (ASM) and regularly advised the White House and US Congress on issues of environment and infectious diseases. During his time as President of the ASM he led the response to the anthrax "attack", when several anthrax-laden letters were sent through the U.S. postal system, informing and advocating congress for the right moves to effectively address the bioterrorism concerns. Prof. Atlas is a recipient of the American Society for Microbiology award in Applied and Environmental Microbiology American Society Microbiology, 1991. He is a Fellow of the American Academy Microbiology.

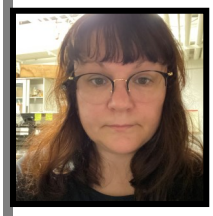
Who's New and What's Shaking

Post Doc Associates & Visiting Scholars

Benites Felipe, Visiting Scientist
Lab: Debashish Bhattacharya
I am a NASA postdoctoral fellow and a visiting scholar at Bhattacharya Lab. researching the roles of viruses in the evolution of algal life and complexity. I was born in Brazil, and did my PhD at Sorbonne University (France).

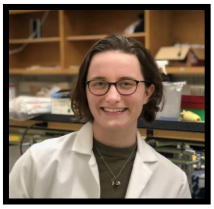
Silvia Benevenuta, Visiting Scholar
Lab: Yana Bromberg
I'm visiting Dr. Bromberg's lab from the University of Torino, Italy, to improve the existing pipeline of AVA,Dx and to extend its functionality.

Emre Babur, Visiting Scientist
Lab: Max Häggblom
An Assistant Professor from Kahramanmaraş Sütçü Imam University, my current work is focused on understanding how the different species and location controls the bacterial communities' activity in carbon remineralization in acidic soils. Our approach is to combine comparative physiological analysis of the soil microbiota with ecological field studies to elucidate the interactions/feedbacks among the community members in response to changes in environmental conditions.



Kylie Ryan Kaler, Post Doc Associate
Lab: Jeff Boyd
I am a postdoctoral researcher in Dr. Jeff Boyd's lab and we study *Staphylococcus aureus* iron utilization. I received my PhD from Virginia Tech where I studied signal transduction in *Pseudomonas* aeruginosa.

Wessam Mohamad, Post Doc Associate
Lab: Maria Gloria Dominguez-Bello
As a post-doc at the Dominguez-Bello Lab I am looking at the host-associated microbial alterations as a result of ecological alterations, for instance "urbanization". How can the western lifestyles influence the host associated microbiome in different body sites? Which urbanization level contribute more to the microbiome variation? What other intrinsic or extrinsic factors play a role in the microbiome variation.



Adriana Messyasz, Post Doc Associate
Lab: Max Häggblom
Adriana Messyasz joined the department in February 2022. I am working on a collaborative project in the Häggblom, Kerkhof, and Pinsky labs using various 'omics approaches to characterize bacterial community structure and function in polar soils.

Faculty

Kessler Mccoy-Simandle, Teaching Instructor
I teach the two-semester General Biochemistry sequence (403-404). While originally from Kentucky, I left for schooling. I completed my PhD at Northwestern University in the Microbiology and Immunology department. I then moved to this corner of the country to do a postdoc at Albert Einstein College of Medicine. I am happily married and have a 3-year old daughter named Shaw. While I am currently taking a break from my rock climbing hobby, I enjoy watching Chicago Blackhawks hockey, UK basketball and reading (mostly fantasy).

Karla Esquilín-Lebron, Teaching Instructor
In September 2022, I joined our faculty as a Teaching Instructor. I teach General Microbiology Laboratory sections, Microbial Products in a Sustainable Garden State & Beyond course, and the Experiments in Microbial Ecology and Diversity Laboratory. I also am the faculty advisor for the undergraduate Rutgers Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) chapter.

Staff

Michelle Mac Pherson, Department Administrator
We welcome Michelle Mac Pherson as our new Department Administrator. Michelle serves as the primary HR liaison for the department and handles all personnel matters including recruitment, reappointments, promotions, and tenure process for faculty. Michelle serves as a liaison with Rutgers Global and processes all Visa requests. Her goal is to provide guidance on a variety of HR related issues in order to achieve workforce excellence.

Nalini Kaul, Biochemistry Coordinator
The Department welcomes Nalini Kaul, our new program coordinator for the Biochemistry major. Nalini has been with Rutgers since 2011 including working for us from 2014 – 2016. Previously, she worked for more than 20 years as a Foreign Service National in India for the U.S. Department of Agriculture. She enjoys work involving interaction with students, staff & faculty who have been so humbly helpful and warm. Nalini always has a smile on her face and a positive attitude. On a personal note, she enjoys writing poems, cooking and company of her pet.

Congratulations!

Ines Rauschenbach welcomes a baby girl

"*Ella*" to her family

Activities

Debashish Bhattacharya and Collaborators Receive a NSF Grant to Study Coral Genomics and Genetics.

Max Häggblom an collaborators receive a NSF grant to determine genetic, phylogenetic and functional mechanisms that shape microbiome diversity of polar and alpine soils.

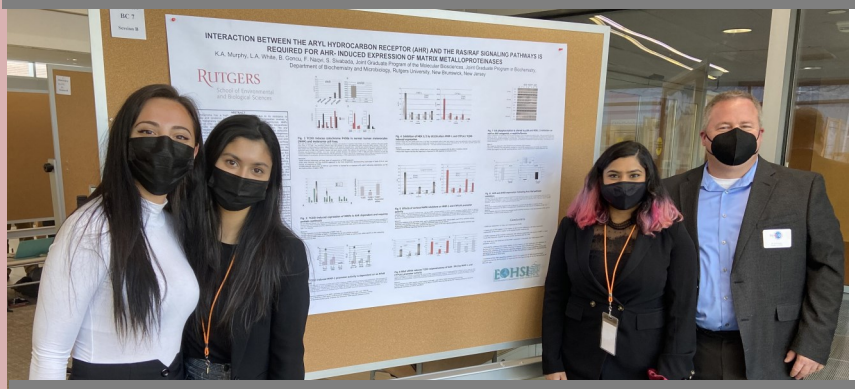
Max Häggblom Named Fellow of the American Association for the Advancement of Science

Microbiology instructor team **Ines Rauschenbach**, **Ramaydalis Keddis**, Jessica Lisa, and Julia Van Etten publish a Tips and Tools article in the Journal of Microbiology and Biology Education

Karla Esquilin-Lebron selected as a Tiny Earth Partner Instructor. Tiny Earth is a CURE course focused on antibiotic discovery. She will be joining the instructor training workshop this summer in Baltimore. https://tinyearth.wisc.edu

Natalya Voloshchuk and **Kessler McCoy-Simandle** were selected to the 2022-23 cohort of the Provost's Teaching Fellows.

Biochemistry Undergraduate researchers Present at William Patterson Symposium



Three Biochemistry Undergraduate researchers Beril Goncu, Fizza Syed Naqvi, Shefaali Sivabada from the **Lori White/ Keith Cooper/Kyle Murphy** lab group went to an Undergraduate Research Symposium at William Patterson to present a poster titled "Interaction Between the Aryl Hydrocarbon Receptor (AhR) and the Ras/Raf Signaling Pathway is Required for AhR-Induced Expressin of Matrix Metalloproteinases."

Rutgers Day 2022

DBM Retirements

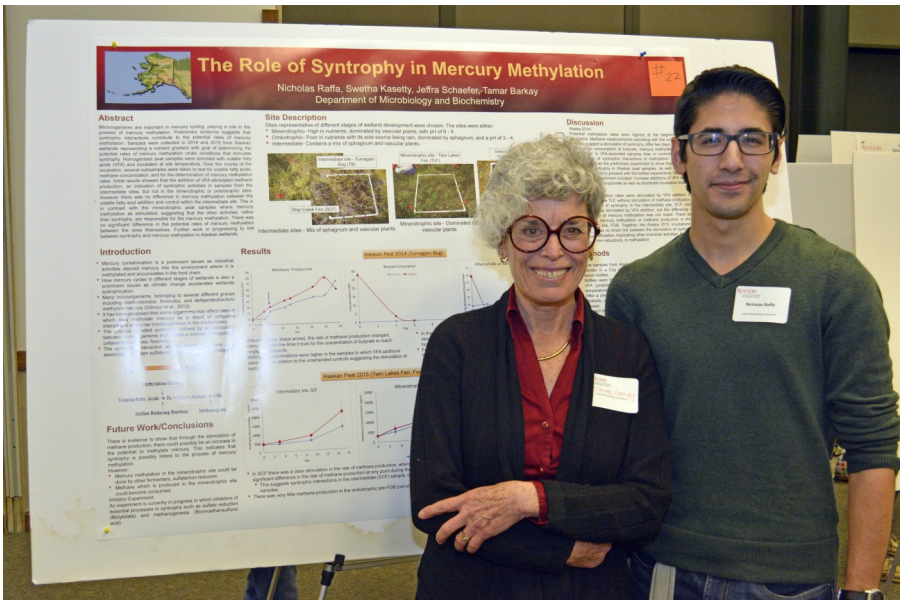
Distinguished Professor Tamar Barkay Retires in 2021

Tamar Barkay retired from the Rutgers faculty in 2021. In June 2021, she gave her retirement seminar via Zoom: "**Mercurial life: retirement talk ...onward**!"

Tamar joined the faculty of Biochemistry and Microbiology at Rutgers in 1999, and was promoted though the ranks, to Distinguished Professor in 2015. She earned her Ph.D. form the University of Maryland (1980) with Rita Colwell. Prior to coming to Rutgers she had been on the research staff of the EPA Environmental Research Laboratory in Gulf Breeze FL for many years and was already well known for her work on mercury transformations and heavy metal resistance genes in bacteria.

Indeed, Tamar is an internationally established authority in the field of environmental microbiology and world-leading expert on microbial-mercury interactions. She has made seminal, internationally recognized contributions in elucidating the microbial processes that impact the mercury cycle and how these can be exploited to manage polluted environments. Over her career she has pioneered innovative methodology in the field of microbial ecology, specifically in how microbial activities affect the environmental fate of inorganic contaminants. In particular, she and her team have made fundamental discoveries on the genetic, evolutionary and ecological basis of microbial mercury transformations. Her work has extended from environmental chemistry to the microbial processes in diverse habitats: focusing in on the microorganisms responsible for Hg transformations, the genes responsible for the catalysis and their regulation and their evolution through time, and their links to Earth's geochemical change. She has studied aerobic and anaerobic environments, pristine and contaminated regions, soils, marine and freshwater locales, hydrothermal vents, temperate and polar areas, and investigated the role of bacteria, archaea, and eukaryotes, leading to fundamental discoveries on the genetic, evolutionary and ecological basis of microbial Hg transformations. One of her special attributes is in connecting biochemistry and microbial genetics with microbial ecology. She was an early innovator in the development and application of molecular biological tools to microbial ecology, pioneering innovative and sophisticated methodology that quickly became essential to the field. For both our graduate and undergraduate students Tamar is linked with Microbial Ecology, the course she has developed, taught and re-developed over her time at Rutgers.

Tamar has been nationally and internationally recognized for her research. She was a European Commission's Marie-Currie Incoming Scholar in 2010, she is an elected fellow of both AAAS and the American Academy of Microbiology, and she received the Rutgers Board of Trustees Award for Excellence in Research in 2015.


The Role of Syntrophy in Mercury Methylation
Nicholas Raffa, Swetha Kasetty, Jeffra Schaefer, Tamar Barkay
Department of Microbiology and Biochemistry
Abstract
Site Description
Discussion
Introduction
Results
Future Work/Conclusions

Professor Peter Kahn Retires in 2022

Prof. Peter Kahn retired at the end of June 2022 after over four decades of service at Rutgers. In May 2022 we celebrated Peter with a symposium in his honor.

Peter joined the Rutgers faculty in 1976 as an Assistant Professor in what is now the Dept. of Biochemistry and Microbiology. He was promoted to Associate Professor with tenure in 1981 and to Professor in 2000. Peter's research has covered a wide range of topics. Earlier in his career he worked on the analysis of Agent Orange exposed Viet Nam veterans and he became one of several strong voices in support of caring for veterans who needed care. Peter's work has focused on understanding how proteins interact with the molecules, such as water, surrounding them within cells. He is known for his expertise in the structural analysis of proteins and he has worked on the structure and function of a range of proteins, including cellulase, Shiga toxin, among many other projects and collaborations.

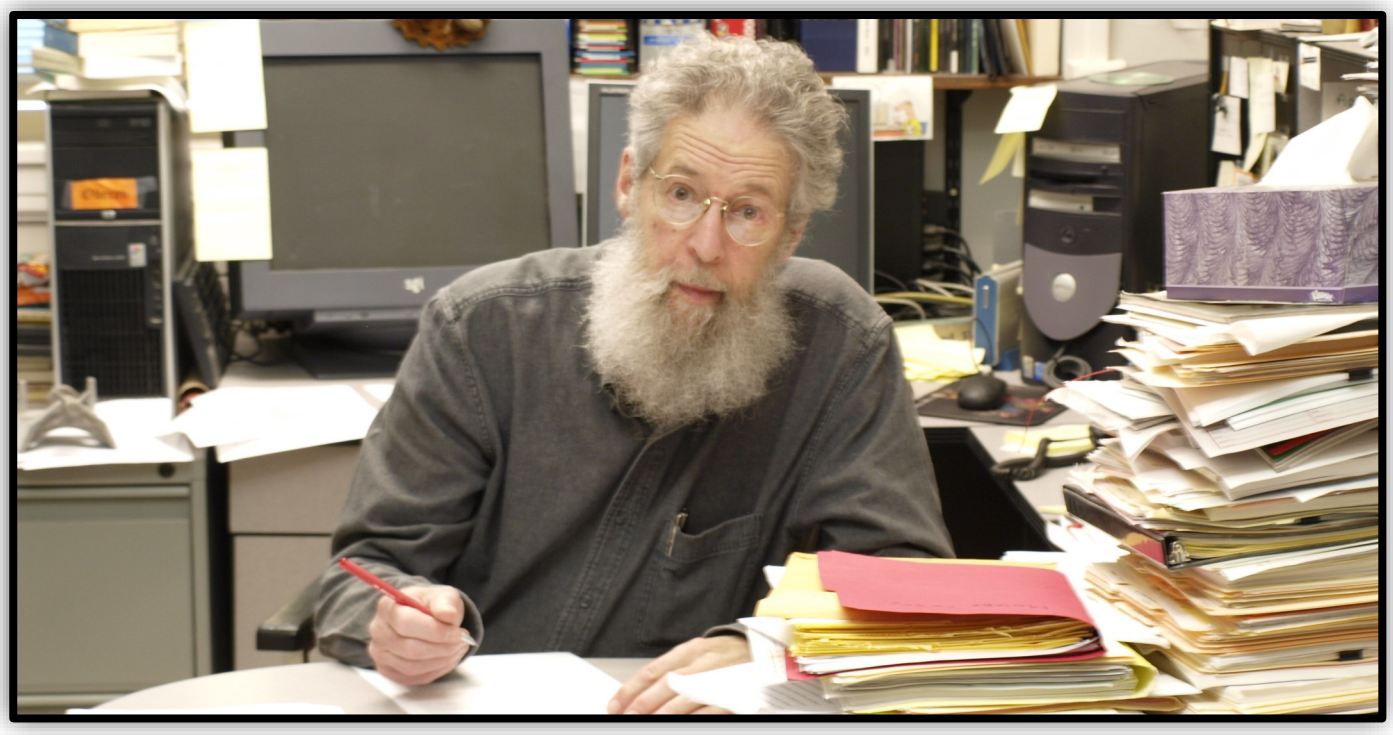
Peter has been a central pilar in the undergraduate biochemistry program at the School of Environmental and Biological Sciences. Indeed, he is synonymous with the undergraduate course General Biochemistry, the core 2-semester course taken by Biochemistry, Biotechnology and Microbiology majors, and many other students. He taught this course since his first semester at Rutgers, to an estimated 5000 students or more. "I survived the wrath of Kahn" was a popular T-Shirt among seniors for many years. Numerous undergraduate research student have worked in his lab over the year.

You can read more about Peter's career in the 2017 issue of the Lipman Log.

Peter has been recognized through numerous awards at Rutgers, and beyond: the Rutgers University President's Award for Public Service, 1998; the Warren Susman Award for Excellence in Teaching, 2003; Cook College Academic and Professional Excellence Award, 2005; the School of Environmental and Biological Sciences, Teacher of the Year Award, twice in 1996 and 2019; and the Rutgers University Clement A. Price Human Dignity Award, 2018. As noted in the nomination for the Clement A. Price Human Dignity Award: At every opportunity Peter weaves matters of human dignity into his teaching and his other activities. He not only feels compassion for students in need, but acts on their behalf, such as the Bosnian Student Project. He has created an inclusive community and climate of civility among students, faculty, and staff. He has played a central role in forging intercultural cooperation and collaboration, and made major efforts in reducing prejudice and promoting respect for diversity. He sets an example of what it means to act upon a sense of social responsibility.

To recognize Peter's dedicated teaching and mentoring of his students and the enormous impact that he has had on undergraduate education at Rutgers, we have established the Peter Kahn Endowed Biochemistry Scholarship. This scholarship will support biochemistry students and allow them the engage in summer research with a faculty mentor.

Donations to the Peter Kahn Endowed Biochemistry Scholarship can be made via: https://give.rutgers.edu/kahnscholarship




Jennifer
Peter


HAMMERMILL
POTTY um!

MAKE A GIFT

Through the years, students in the Department of Biochemistry and Microbiology have been supported in many ways, such as grants, assistantships, corporate funds and fellowships endowed by individuals.

Financial support is critical to the ongoing success of our students, and allowed them the opportunity focus fully on their education and research. The next generation of gifted students in microbiology and biochemistry need your support. As traditional funding mechanisms become more difficult to secure, we turn to our community of dedicated alumni and friends to support those who will come after them, and continue their legacy of achievement. Please consider making a gift to the following funds:

1. The Douglas E. Eveleigh Endowed Graduate Fellowship
2. Graduate Student Travel Awards (Stephen M. Cuskey and Douglas E. Eveleigh)
3. Peter Kahn Endowed Scholarship
4. James Macmillan Graduate Fellowship
5. Department of Biochemistry and Microbiology Fund

For online donations, please visit **http://dbm.rutgers.edu/giving.html**

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