



New Polymer Allows Researchers to Focus on Cell Membranes to Develop Alzheimer's Treatments

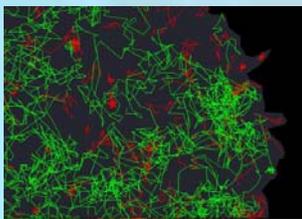
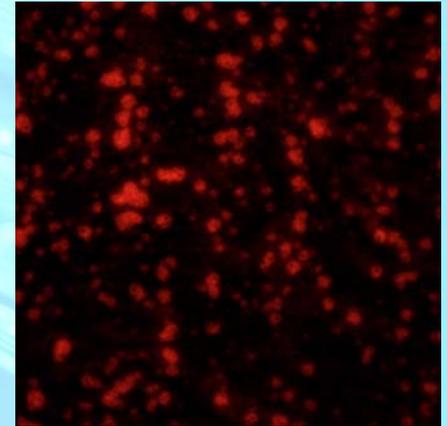
Biophysics researchers in the Ayyalusamy Ramamoorthy lab have created a new polymer that mimics a cell membrane, which could open an avenue for developing treatments for Alzheimer's disease.

The protein amyloid-beta builds up in the brains of people with Alzheimer's disease, ultimately aggregating into sticky clumps called "plaque" on the surface of neurons. Thin parts of the cell membranes of neurons turn out to be particularly vulnerable to this protein, but these proteins are difficult to study.

The new polymer's ability to form large lipid nanodiscs and provide a suitable environment for proteins is helping researchers examine how components of cell membranes and the physical and chemical properties of the lipid membrane influence the aggregation of the amyloid-beta. The researchers have found that detergent-like fatty acid chains interact with the plaque, allowing that plaque to penetrate the cell membrane. A technique called phosphorus-31 nuclear magnetic resonance is used to image the protein at an atomic level within the nanodisc.

According to Ramamoorthy, the Robert W. Parry Collegiate Professor of Chemistry and Biophysics, "The thickness of cell membranes is very important not only for Alzheimer's disease, but also for diabetes and other aging-related diseases." He also indicated that "Many other labs are investigating the amyloid inhibition by small molecules in solution, but we are doing it in a membrane environment. From our study it is clear that the cell membrane is the hot spot where amyloid-beta becomes crazy."

Ramamoorthy's group has filed for a U.S. patent on the polymer, which can have a significant impact in the study of a variety of proteins found in cell membranes.



Biophysics Uniqueness in Research and Education

The breadth and depth of research and training opportunities available in our Biophysics program is directly related to the high quality and varied expertise of our core and affiliated faculty members, who create a truly interdisciplinary and stimulating environment.

Over the past five years we have been able to hire outstanding young faculty members who address biophysical questions from the holistic systems level. This includes professors Kevin Wood and Qiong Yang, who work on bacterial resistance and the role of bacterial community structure in promoting and propagating bacterial resistance, and the study of biological clocks (the topic for which the Nobel Prize in Medicine was awarded this year) and the influence of these clocks on developmental processes as well as cell cycle function. They complement our core of Biological Physics research thrusts which include professors Chris Meiners, Sarah Veatch, and Michal Zochowski.

Additionally, we have added significantly to our faculty whose research focus is at the molecular level, with the addition of professors Randy Stockbridge, Aaron Frank, Sarah Keane, and most recently, Markos Koutmos. The research focus of Stockbridge and Koutmos is in protein structure and function with crystallography and cryo-electron microscopy being primary tools. Stockbridge's emphasis is in integral membrane ion transporters, and Koutmos is interested in structure function relationships in mitochondrial RNA transport and vitamin B12. Frank and Keane bring to the department expertise and interests in RNA structure and function, and RNA as a potentially important target for drug development. They utilize methods of theory and simulation and NMR spectroscopy as key biophysical tools in addressing their research objectives.

This growth in the area of molecular biophysics builds on, and strongly couples with, our outstanding senior faculty within the Biophysics core, which includes professors Ayyalusamy Ramamoorthy, James Penner-Hahn, and Charles L. Brooks III. In addition, there are over 40+ Biophysics affiliated faculty across the schools and colleges of LS&A, Medical School, School of Pharmacy, College of Engineering, and the School of Public Health.

This inherent interdisciplinarity in our faculty and program provides for a wide range of unique opportunities for cutting-edge research and training. More information about our outstanding faculty and their recent research achievements and external recognitions can be found on the Biophysics website at <https://lsa.umich.edu/biophysics>.

WELCOME FROM THE DIRECTOR

Greetings Alumni, Friends, and Prospective Students:

I am delighted to bring you the inaugural Biophysics newsletter. I would first like to thank everyone for your continued support of Biophysics over the years, as many of you have watched the unit transform in 2007 from a research unit within the Office of Research to a unique graduate and undergraduate program within the College of Literature, Science, and the Arts.

Over this past decade, Biophysics has established a strong undergraduate curriculum, with new Biophysics majors successfully journeying to the next stage of their career development in academia, medicine and industry. We have also continued our tradition of excellent graduate and post-graduate training in the laboratories of more than fifty faculty across a dozen departments and more than three schools. I invite you to peruse the short history of Biophysics at U of M included in this issue to see the early and significant impact it has had on this field of study.

At this time I want to share with you some of the developments that have occurred as we have grown. Most notably, over the past five years we have hired outstanding young faculty members who address biophysical questions from the holistic system's level as well as those whose research focus is at the molecular level. The broad and rich research interests of these new faculty, as well as our more senior core faculty members, are presented in the following pages of this newsletter.

Faculty development is a strong focus within Biophysics, and I am pleased to note that we recently considered our first promotion and tenure case as an LSA unit, with professor Sarah Veatch promoted to Associate Professor with tenure as of September 2017. Professor Veatch has established a truly outstanding research program at the interface of biology and physics, as outlined later in this newsletter. Also, as the natural evolution of departments and programs, we will see Professor Ari Gafni move to emeritus status beginning January 2018. Professor Gafni has been a stalwart member of our department, working tirelessly to better his colleagues, our program and our knowledge of the role of folding and misfolding in human disease. We wish Ari the best as he transitions to this new career phase and trust that he will remain an active member of our community.

Our undergraduate program, newly established only a decade ago, continues to grow and prosper, with the recent introduction of two major tracks, Biological Physics and Structural Biology, emphasizing our strong and broad faculty interests and the need for sound foundational training in the quantitative aspects of biological structure and function. Commensurate with these curricular developments has been the introduction of new courses in the freshman year, one of which is our DNA Origami class, which will present a public display of their work in the Hatcher Graduate Library with a reception on November 29, 2017, from 6-8 p.m. We cordially invite you to attend if you are able. The exhibit will remain in the library gallery until January 12.

Our graduate program continues to thrive. Our graduate students are at the core of the outstanding research being carried out in our laboratories, and are being recognized for their accomplishments through awards and recognitions, including NSF pre-doctoral fellowships, HHMI Gilliam Fellowships and a host of other acknowledgments of their ongoing excellence in science and citizenry.

In closing, I would like to note that it is truly my honor and pleasure to serve as the Director of our Biophysics Program. I remain extremely excited by the developments of my faculty colleagues and their co-workers, as well as the achievements of our students. I look forward to a new year that exceeds our expectations from the last.

We benefit enormously from your help and support and encourage you to share with us what you are doing. Finally, if you find yourselves in Ann Arbor, please take a few minutes and visit us. We look forward to hearing from you and seeing you in the future.



Charles L. Brooks III
Director and Professor of Biophysics
Cyrus Levinthal Distinguished Professor of Chemistry and Biophysics
Warner-Lambert/Parke-Davis Professor of Chemistry

NEW BIOPHYSICS CORE FACULTY



Aaron Frank
*Assistant Professor of Biophysics
& Chemistry*

Aaron joined us in Fall 2016 after his postdoctoral studies in Chemistry as a prestigious U of M Presidential Postdoctoral Fellow, where he worked on developing a framework for modeling the structure of small non-coding RNA molecules. Aaron earned a B.A. in Chemistry from City University of New York (2006), and completed his Ph.D. in Physical Chemistry under Ioan Andricioaei at UC, Irvine (2011). He then worked as a research fellow for two years at Nymirum – a small company directed toward drug development for RNA targets.

In order to understand the relationship between molecular structure and dynamics and biological function, Aaron's group seeks to develop and deploy integrative modeling tools to elucidate the structure and dynamics of biologically relevant molecules. Methods utilize readily accessible experimental observables from a variety of sources to first guide structure prediction efforts and then guide atomistic simulations to map the entire conformational landscape of these molecules. They are interested in using these methods to understand how functional ribonucleic acids — either by themselves or in concert with other molecules — achieve specific cellular functions.

<https://sites.google.com/a/umich.edu/afrankz-research/home>



Sarah Keane
*Assistant Professor of Biophysics
& Chemistry*

Sarah joined us in Winter 2017, and graduated from Furman University with a B.S. in Chemistry (2007). Under the direction of David Giedroc, she received a Ph.D. in Chemistry from Indiana University (2012). She then accepted a postdoctoral position with Michael Summers at the Howard Hughes Medical Institute at the University of Maryland Baltimore County.

Research in the Keane Lab is focused on understanding the function of biologically-relevant non-coding RNAs by examining their structure and interactions with other biomolecules. Structure and function are inherently intertwined, thus uncovering biomolecular structure sheds light on the functional roles that these biomolecules play in biology. The discovery of functional non-coding RNAs has revolutionized our understanding of gene expression and regulation. Additionally, there is a wealth of information implicating non-coding RNAs as key regulators of a variety of cellular and pathogenic processes. The Keane Lab utilizes biomolecular NMR spectroscopy complemented with a variety of biochemical and biophysical techniques. Sarah's research program seeks to uncover the structures, mechanisms, and functional roles of biologically relevant ncRNAs in disease progression.

<https://sites.lsa.umich.edu/keane-lab/>



Randy Stockbridge
*Assistant Professor of Biophysics &
Molecular, Cellular &
Developmental Biology*

Randy joined us in Winter 2016. After graduating from Princeton University with an A.B. in Molecular Biology (2005), she went on to study with Richard Wolfenden at the University of North Carolina at Chapel Hill, and received her Ph.D. in Biochemistry and Biophysics (2010). She then did postdoctoral work with Chris Miller at Brandeis University.

Randy's research program focuses on membrane transport proteins – channels and energy-coupled pumps – which are the molecular gatekeepers of the cell. For microbes afloat in a hostile environment, these proteins import vital nutrients and export dangerous toxins. Utilizing a breadth of biochemical and biophysical techniques, including electrophysiology, membrane protein biochemistry, X-ray crystallography, and macromolecular NMR spectroscopy, her lab is delving deeply into these bacterial export systems to reveal novel physiologies and structural surprises.

<https://sites.lsa.umich.edu/randystockbridge/>



Markos Koutmos
*Assistant Professor of Biophysics
& Chemistry*

Markos is set to join our faculty ranks in Fall 2018, but has already set up his research program here as a Research Assistant Professor in order to continue his NIH-funded research. He received his undergraduate degree in Chemistry from the University of Athens, Greece (1998), and his Ph.D. in Chemistry from the University of Michigan under Dimitri Coucouvanis (2005). Markos then did his postdoc work here in Biophysics under Martha Ludwig, and continued as a postdoctoral fellow at the Life Sciences Institute under Biophysics affiliated faculty Janet L. Smith, and Rowena G. Matthews. After serving as a Research Investigator at LSI, he became an Assistant Professor of Biochemistry and Molecular Biology at the Uniformed Services University of the Health Sciences in Bethesda, Maryland.

Markos' research focuses on understanding the relationship between the structure, dynamics and function of biological macromolecules. His lab uses a diverse combination of powerful tools, such as x-ray crystallography, electron microscopy, biochemistry and cell biology approaches to study how mitochondrial RNAs and vitamin B12 are processed and utilized. This work will provide the molecular level framework necessary for understanding and ultimately treating a wide-range of diseases.

BIOPHYSICS CORE FACULTY



Charles L. Brooks III
 Director & Professor of Biophysics,
 Cyrus Levinthal Distinguished
 University Professor of Chemistry
 & Biophysics, Warner-Lambert/
 Parke-Davis Professor of Chemistry

The Brooks research lab is focused on the application of statistical mechanics, quantum chemistry and computational methods to chemically and physically oriented problems in biology.

<https://brooks.chem.lsa.umich.edu/>



Sarah Veatch
 Associate Professor of Biophysics

The Veatch lab is currently exploring the physical basis of functional lateral heterogeneity in living cell membranes using a variety of experimental and theoretical approaches, including super-resolution fluorescence localization microscopy, fluorescence imaging of fluctuations in isolated plasma membrane vesicles, and Monte Carlo modeling of basic signaling processes.

<http://www.veatchlab.com/>



Jens-Christian Meiners
 Professor of Biophysics & Physics

The Meiners research group's emphasis is on understanding how the topology of a DNA molecule, manifested in e.g. a linear, circular, knotted or super coiled conformation, affects the dynamics of the molecule, its interaction with other molecules like regulatory proteins, and ultimately its biological functions.

<http://meiners.biop.lsa.umich.edu/>



James Penner-Hahn
 Professor of Biophysics & Chemistry

The lab's research is focused on understanding the many roles that trace metals (especially Mn, Fe, Co, Ni, Cu and Zn) play in biology - such as how they are associated with numerous disease states, and on the biochemistry of metalloenzymes (proteins with metals at their active sites) and how they work. They extensively use synchrotron radiation and the unique resources available at synchrotron labs in the U.S. and abroad.

<http://www.umich.edu/~jphgroup/>



Ayyalusamy Ramamoorthy
 Professor of Biophysics & Chemistry

The development of solid-state NMR methods and their applications to determine the structure, folding and dynamics of membrane proteins are the main goals of the research program. Peptide antibiotics, human apolipoprotein, cytochrome b5, viral protein, functional fragments of GABA receptors, and amyloidogenic peptides are some of the systems currently under investigation by this group.

<http://rams.biop.lsa.umich.edu/>



Kevin Wood
 Assistant Professor of Biophysics

Research focuses on the development and application of similar approaches for the study of living systems, where biologically-relevant dynamics—for example, the evolution of drug-resistance in a population of cancer cells—emerge from interactions and competition between a large number of individual components. Using both theoretical and experimental tools, they study a wide range of biological systems.

<http://woodlab.biop.lsa.umich.edu/>



Qiong Yang
 Assistant Professor of Biophysics

The Yang lab studies dynamic self-organizing behaviors of single cells and single molecules during early embryo development. By connecting the understanding at the molecule, cellular, and tissue levels, they pin down the physical mechanisms that give rise to collective spatio-temporal patterns from complex interactive networks of cells and molecules through biochemical signals and mechanical forces.

<http://www-personal.umich.edu/~qiongy/>



Michal Zochowski
 Professor of Biophysics & Physics

The focus of work in the Zochowski lab is to increase understanding about mechanisms of formation and the role of spatio-temporal patterns emerging in the brain during the information processing. This is done using both, experimental as well as theoretical approaches.

<http://zochowski.biop.lsa.umich.edu/>

BIOPHYSICS FACULTY NEWS

Veatch Promotion

Congratulations to Biophysics core faculty member Sarah Veatch, who was promoted to Associate Professor with tenure as of September 1, 2017. Professor Veatch has established a truly outstanding research program at the interface of biology and physics, exploiting fundamental physical behaviors of membrane systems to understand how biological membranes in all cells function to facilitate signaling, anesthetic response and many organizational processes that are necessary for healthy cellular function. Sarah was also one of four faculty selected to receive the 2017 Henry Russel Award, one of the university's highest honors for junior faculty.

Brooks Distinguished Professor

In May, Biophysics Director Charles L. Brooks III was one of seven faculty members who received one of the University of Michigan's top honors as a Distinguished University Professor. Established in 1947, this honor recognizes senior faculty with exceptional scholarly or creative achievements, national and international reputations for academic excellence, and superior records of teaching, mentoring and service. Professor Brooks was named the Cyrus Levinthal Distinguished University Professor of Chemistry and Biophysics. He is also the Warner-Lambert/Parke-Davis Professor of Chemistry, and Professor of Biophysics.

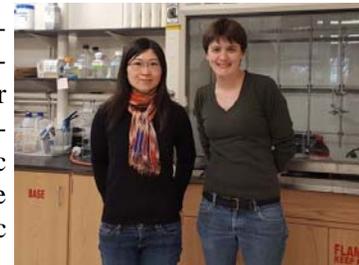


Gafni Retirement

We will sadly see Biophysics Professor Ari Gafni move to emeritus status as of January 2018. Professor Gafni has been a stalwart member of Biophysics, working tirelessly to better his colleagues, our program, and our knowledge base of the role of protein folding and misfolding in human disease. He brought to these studies novel methods integrating biochemical approaches with single molecule imaging and spectroscopy, and mentored over 75 new scientists. We wish Ari the best as he transitions to this new career phase, and look forward to having him remain active in Biophysics.

SLOAN FELLOWS AWARDED

Biophysics is proud to announce that two of our faculty, Assistant Professors Randy Stockbridge and Qiong Yang, have been awarded 2017 Alfred P. Sloan Foundation Research Fellowships. Yang received the prestigious fellowship in Physics and Stockbridge received her honor in Computational and Evolutionary Molecular Biology. They are among the 126 early-career Sloan scholars who received recognition as representing the most promising scientific researchers working today. The Sloan Research Fellowships are extraordinarily competitive awards, and their achievements and potential place them among the next generation of scientific leaders in the U.S. and Canada. It is a great honor to have our faculty recognized in this manner.



Michigan Biophysics Through the Years

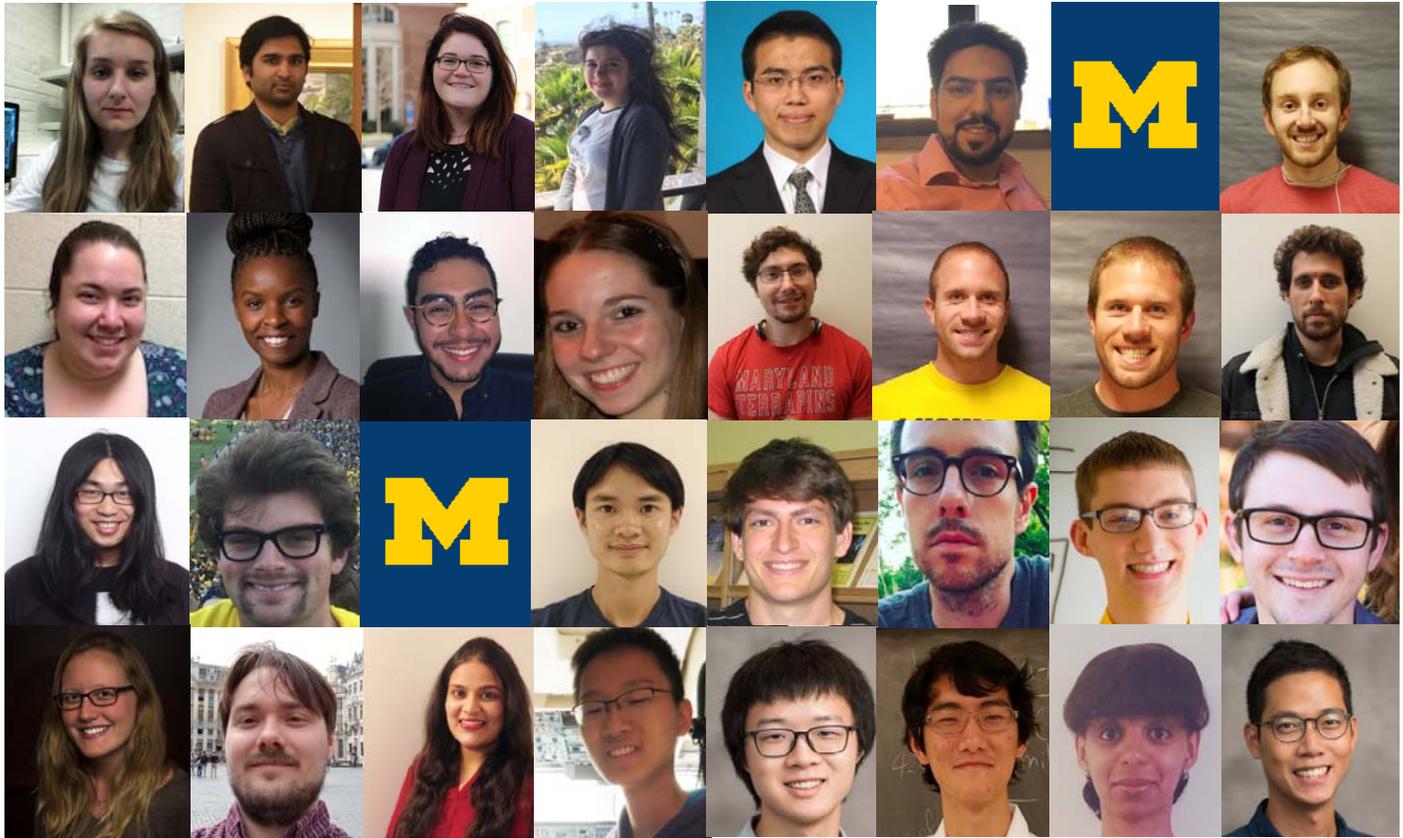


Biophysics at U of M has played a central role throughout history in defining this emerging field. The following timeline contains highlights of Biophysics at Michigan on the national and international level.



- ◇ **1926:** Biophysics at Michigan has its start with Detley Bronk (future president of the National Academy of Sciences) who received a Ph.D. in Physics and Physiology, a first for the nation.
- ◇ **Late 1920s-1930s:** Harrison M. Randall initiated spectroscopic studies of viruses, bacteria and other related biological molecules, stimulating the development, at Michigan and elsewhere, of the field of infrared spectroscopy of biological molecules.
- ◇ **Early 1940s:** H. Richard Crane and Robley Williams pioneered methods in electron microscopy to visualize viruses by coating the samples with aluminum, setting the stage for modern techniques and methods in (cryo-)electron microscopy.
- ◇ **1950:** Cyrus Levinthal moved to Michigan after graduate school and pioneered ^{32}P labeling experiments to analyze the unwinding of DNA during replication. Levinthal went on to become the first Chair of a newly formed Department of Biological Sciences at Columbia University. His research efforts beyond Michigan established new paradigms in molecular graphics and modeling and defined the "Levinthal paradox" concerning the complexity of protein folding.
- ◇ **1950s:** Gordon B.B.M. Sutherland and Samuel Krimm, working on a spectrometer built by Randall in the 1930s, created new approaches for the study of proteins using Raman and infrared spectroscopy.
- ◇ **1955:** The University establishes the Biophysics Research Center (BRC) to support graduate training and activities in biophysics.
- ◇ **1956:** Biophysics at Michigan organizes and hosts a key summer symposium that includes future Nobel Laureates and pioneers in Biophysics like Crick, Watson, Rich, Chargaff, Harker, Levinthal, Stent, Benzer Jacob, Spiegelman and Haurowitz..
- ◇ **1962:** J. Lawrence Oncley arrives the first director of the newly renamed Biophysics Research Division (BRD) and becomes the fourth President of the Biophysical Society.
- ◇ **2007:** The decision is made to transition Biophysics to the College of Literature, Science and the Arts (LSA), and the Program in Biophysics is established as an Enhanced Program with tenure-appointing power and a novel undergraduate program in Biophysics.

BIOPHYSICS GRADUATE PROGRAM



The graduate program in Biophysics was established in 1949, making it one of the first such programs in the world. For several decades, Biophysics has been at the center of research at the University of Michigan for researchers focused on applying ideas, concepts, and techniques from the physical sciences to problems in molecular and cellular biology.

Our program encompasses a dozen core faculty members, most with joint appointments in other academic departments such as Chemistry, Physics, and Molecular, Cellular, and Developmental Biology. An additional 40+ affiliated faculty with appointments throughout the University, including the Medical School, College of Engineering, and College of Pharmacy, make for a broad interdepartmental graduate program.

This means that students in Biophysics have the opportunity to experience cutting-edge research in an extremely wide range of areas including biomolecular structure and dynamics, single molecule microscopy, spectroscopy and its applications, neurobiophysics, computational biology and bioinformatics, membrane biophysics, and enzymology, as well as the exciting research initiatives involving the Biophysics NMR Center and the Single Molecule Analysis in Real-Time (SMART) Center.

Current Graduate Student Cohort (above): Efrosini Artikis, Aaron Bart, Julia Bourg, Maral Budak, Chu Chen, Ziah Dean, Kamirah Demouchet, Jeffrey Folz, Katie Gentry, Elizabeth Gichana, Keanu Guardiola-Flores, Kelsey Hallinen, Binyamin Jacobovitz, Jason Karlake, Josh Karlake, Alex Kukreja, Yilai Li, Brian Linhares, Changjiang Liu, Jeff Maltas, Christian MacDonald, Nigel Michki, Marcos Nunez, Hayden Nunley, Kristin Schimert, Quinton Skilling, Nirupama Sumangala, Zhenyu Tan, Zhaowen Tong, Shiyuan Wang, Tehetina Woldemichael, Chi-Wen Wu.

GRADUATE STUDENT HIGHLIGHT:

Kelsey Hallinen (4th Year Biophysics, Wood Lab)

As a grad student in the Wood Lab, Kelsey's interest focuses on bacterial communities and their population dynamics, particularly biofilm communities- when bacteria stack up in a large clump, making them harder to treat. For her research, she created fluorescently labeled strains of bacteria, as well as a fluorescent resistant strain, and grows biofilms of mixed resistant and sensitive cells. She uses confocal microscopy to image the biofilms in different antibiotic environments and is working to understand their changes in spatial organization based on the amount of antibiotic they are grown in.

Congratulations to Our Recent Graduates!

- ◆ Sam Christensen, B.S.
- ◆ Rohan Desai, B.S.
- ◆ Siddhant Dogra, B.S.
- ◆ Hangil Lee, B.S.
- ◆ Shea Ransford, B.S.
- ◆ David Smith, B.S.
- ◆ Ben Travers, B.S.
- ◆ Sarah Graham, Ph.D.
- ◆ Anton, Loukianov, Ph.D.
- ◆ Chanrith Siv, Ph.D.



BIOPHYSICS UNDERGRADUATE PROGRAM

The Biophysics undergraduate program, newly established only a decade ago, continues to grow with the recent introduction of two major tracks, Biological Physics and Structural Biology. These concentrations are designed for students with a strong interest in the natural sciences who intend to embark on a career as a biophysical or medical scientist. It is intended to satisfy the admission requirements of most combined MD/Ph.D. programs and provide a strong foundation for quantitative interdisciplinary work in the biophysical or biomedical sciences, or related fields such as biomedical engineering.

Biophysics is an interdisciplinary science that combines biological knowledge, fundamental principles of physics and chemistry with experimental exploration, mathematical analysis and computer modeling to explain the structures and processes underlying life. As such, Biophysics majors enjoy a flexible curriculum of specially designed biophysics courses as well as coursework from physics, chemistry, and biochemistry.

As part of this program expansion, several new biophysics courses have been introduced:

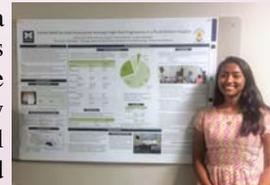
- ◇ *Introduction to Programming in the Sciences*: a gateway course to assist incoming STEM freshman to embrace the logic and reasoning necessary for success in these areas, and to introduce them to basic computer programming skills that are essential for every student in science as our world continues to become more and more digitally-based.
- ◇ *DNA Origami*: offered as a freshman seminar course that provides incoming students with a view of emerging biotechnology as well as advanced biophysical techniques such as single molecule imaging. (Note that this class will present a public display of their work this semester in the Hatcher Graduate Library beginning with a reception on November 29th and running through January 12th).
- ◇ *Structural Biology (I and II)*: these courses emphasize the techniques, methodology and current literature focusing on the establishment of structure-function relationships in biological molecules and their assemblies.

Laboratory research is an essential part of the Biophysics undergraduate experience, and students can choose from over 50 faculty member labs across a dozen university departments. Biophysics also offers an academic minor designed to give students in the natural sciences exposure and skills in quantitative, interdisciplinary work in the biophysical sciences.

UNDERGRADUATE STUDENT HIGHLIGHT: *Victoria Rai (Biophysics Senior)*

Instead of staying in the wet lab this summer, Victoria decided to take her studies abroad to Kumasi, Ghana through the Minority Health and Health Disparities International Research Training (MHIRT) Program. MHIRT is sponsored by the NIH and funds several projects at the University of Michigan. Her project was determining the unmet need for fetal monitoring in a rural, district hospital which could help improve the high neonatal mortality rate in the region. She used a combination of public health analysis techniques to collect demographic and clinical information on the births at the district hospital, qualified what the "typical" mother's health condition was like, and conducted interviews to shed light on the opportunities, barriers, and future directions for the district.

Rai indicated that she has tried to have a global experience each summer in her undergraduate career to broaden her mind as a student and a global citizen. Coming into her senior year, she wanted to have a global experience AND a research experience, and this was her first glimpse of public health research, which she hopes to attend graduate school for. In studying biophysics in her undergraduate education, she hopes to remain quantitatively rooted in her future studies in epidemiology and extend her knowledge of molecular mechanisms of diseases.



BIOPHYSICS AFFILIATED FACULTY

In addition to its core faculty, the interdisciplinary Biophysics program has ~40 affiliated faculty from throughout the University who are involved in Biophysics research and graduate student training. See <https://lsa.umich.edu/biophysics> for more info.

- **Biological Chemistry:** Uhn-Soo Cho, Tom Kerppola, Bruce Palfey, Mark Saper, Jeanne Stuckey, Raymond Triebel
- **Cell & Developmental Biology:** Dawen Cai, Ajit Prakash Joglekar, Kristen Verhey
- **Chemistry:** Julie Biteen, Zhan Chen, Carol Fierke, Mark Banaszak Holl, Raoul Kopelman, Kevin Kubarych, Nicolai Lehnert, Vincent Pecoraro, Roseanne Sension, Nils Walter
- **Computational Medicine & Bioinformatics:** Yang Zhang
- **Electrical Engineering & Computer Science:** Duncan Steel
- **Life Sciences Institute:** Janet Smith, Daniel Southworth
- **Mechanical Engineering:** Allen Po-Chih Liu, Angela Violi
- **Microbiology & Immunology:** Malini Raghavan
- **Molecular, Cellular, & Developmental Biology:** James Bardwell, Matthew Chapman
- **Pathology:** Tomasz Cierpicki
- **Pharmacology:** Arun Anantharam, Alan Smrcka
- **Pharmacy-Medicinal Chemistry:** Heather Carlson, Emily Scott
- **Pharmacy-Pharmaceutical Sciences:** Wei Cheng
- **Physics:** David Lubensky, Jennifer Ogilvie

Congratulations to our affiliated faculty who recently received promotions:
 Julie Biteen
 Ajit P. Joglekar
 Jennifer Ogilvie
 Daniel Southworth



University of Michigan
LSA Biophysics
4028 Chemistry Building
930 N University
Ann Arbor MI 48109 -1055

Address service requested



**Mark your calendars!
U of M Giving Bluesday
Tuesday, November 28, 2017**

Giving Bluesday 2017 provides a special opportunity to continue the University's bicentennial commemoration, and you are asked to consider joining in that day to support the Biophysics programs that you feel most passionate about.

While there will be special donor and social media challenges throughout this day to multiply the impact of your gifts, giving to Biophysics can be done at this or any other time by visiting our website at <https://lsa.umich.edu/biophysics>. Simply click on the "Give Online" button in the "Be a Victor" box and select the Biophysics program area that you would like to support.

Gifts of all sizes are welcome and can make a big difference for growing our program, so please consider whether you are able to join in on November 28, 2017 and celebrate 200 years at U of M! To find out more about Giving Bluesday, please see <http://givingbluesday.org/home>.

Please consider supporting Biophysics!

Biophysics is committed to fostering an inclusive and equitable environment where all faculty, students, and staff feel welcomed and valued, and are able to take full advantage of the resources and opportunities that are available in order to achieve educational excellence. To that end, we are working on finalizing a Diversity, Equity, and Inclusion strategic plan that is in alignment with those of LSA and the University.

DNA ORIGAMI

BioPhysics 130 Exhibition

You are cordially invited to attend the opening reception of a special exhibit showcasing unusual nanoscopic scale images created by students in the Biophysics DNA Origami class.

The DNA Origami course explores the theory and methods behind synthetic biology, focusing on one particular technology called DNA origami, which uses folded DNA as building blocks to construct nano-scale objects via self-assembly.

As part of the fall LSA Bicentennial themed semester, the course culminates with a public display of visualizations of the student's results at the Hatcher Graduate Library gallery space. Attendees will get a visual glimpse of the future of biotechnology and cutting-edge research methods in Biophysics. The event is free and open to students, faculty, staff, and the general public.

Date: Wed, Nov 29th
Time: 6:00-8:00pm
Location: Hatcher Graduate Library Gallery (Room 100)

The poster features a dark blue background with a glowing yellow DNA origami structure. The text is in white and yellow, providing details about the exhibition and the event.