

Welcome to the Department of Biochemistry and Molecular Biophysics

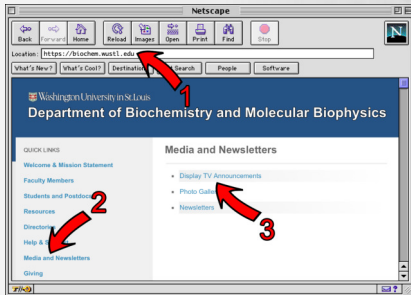


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Congratulations to Dr. Garcia



August 16th, 2021 – **Benjamin Garcia, PhD**, Raymond H. Wittcoff Distinguished Professor and Head of Biochemistry and Molecular Biophysics, along with Philip A Cole, MD, PhD, Professor Biological Chemistry & Molecular Pharmacology at Harvard Medical School, received a new three year grant award from The National Science Foundation for their research entitled "***Collaborative Research: MFB: Deciphering the Logic of PTM Crosstalk via Novel Chemical Technology: Histones and Beyond***".

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September Publication



Maria Papadaki, Theerachat Kampaengsri, **Samantha K. Barrick**, Stuart G. Campbell, Dirk von Lewinski, Peter P. Rainer, Samantha P. Harris, **Michael J. Greenberg**, & Jonathan A. Kirk

Myofilament glycation in diabetes reduces contractility by inhibiting tropomyosin movement, is rescued by cMyBPC domains

J Mol Cell Cardiol. 2021 Sep 3;162:1-9. doi: 10.1016/j.yjmcc.2021.08.012. (2021)

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Congratulations to Dr. Holehouse

August 18th, 2021 – **Alex Holehouse, PhD**, Assistant Professor of Biochemistry and Molecular Biophysics, along with Shahar Sukenik, Assistant Professor, Department of Chemistry & Biochemistry at University of California, Merced, and Thomas Boothby, Assistant Professor, Department of Molecular Biology, University of Wyoming, received a new four year grant award from the National Science Foundation through the new “Integrative Research in Biology” mechanism for their research entitled ***“Collaborative Research: Functional Synergy Between Disordered Proteins and their Environment in Desiccation Protection”***.



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September Publication



Ryan J. Emenecker, Daniel Griffith, & Alex S. Holehouse

Metapredict: a fast, accurate, and easy-to-use predictor of consensus disorder and structure

Biophys J. 2021 Sep 2;S0006-3495(21)00725-6. doi: 10.1016/j.bpj.2021.08.039. (2021)

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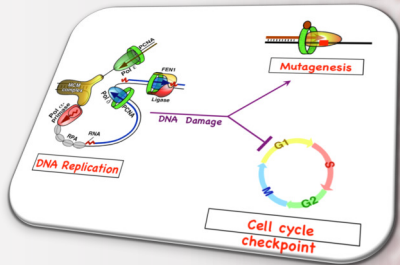
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Spotlight on Research

The **Burgers Lab** studies DNA replication and DNA damage response in eukaryotic cells. Using yeast as a model organism, the lab integrates the biochemical analysis of DNA-protein interactions in purified model systems with the genetic analysis of targeted yeast mutants. Specific areas of interest are lagging strand DNA replication and Okazaki fragment maturation, damage induced mutagenesis, and DNA damage cell cycle checkpoints.

Right: DNA replication fork and Okazaki fragment maturation



See more research:
biochem.wustl.edu/spotlight

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June Publication



Samantha K. Barrick, Lina Greenberg, & Michael J. Greenberg

A Troponin T Variant Linked with Pediatric Dilated Cardiomyopathy Reduces the Coupling of Thin Filament Activation to Myosin and Calcium Binding

Mol Biol Cell. 2021 Jun 23;mbcE21020082. doi: 10.1091/mbc.E21-02-0082. (2021)

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Congratulations to Matthew



August 17th, 2021 – **Matthew A Cruz, BS**, Pre-Doc Trainee in the department of Biochemistry and Molecular Biophysics, and the laboratory of Gregory Bowman, PhD, received a new three-year fellowship award from the National Institutes of Health, National Institute of Allergy and Infectious Diseases for his research entitled ***"Leveraging protein dynamics to drug filovirus protein-nucleic acid interactions using simulations and experiments"***.

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September Publication



Ishan Taneja & Alex S. Holehouse

Folded domain charge properties influence the conformational behavior of disordered tails

Curr Res Struct Biol. 2021 Sep 7;3:216-228. doi: 10.1016/j.crstbi.2021.08.002. (2021)

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COVID-19



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screening.wustl.edu

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Congratulations to Dr. Hall

September 24th, 2021 - **Dr. Kathleen Hall** was promoted to serve as a senior member of the Washington University School of Medicine Committee on Admissions in recognition of her contributions and dedication to the WUSM Admissions process.



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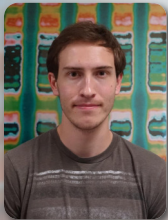
**Congratulations to Gregory Harrison for being selected as the
2021 Ceil M. DeGutis Prize Fellow**



Gregory Harrison is a 5th year PhD student in the Molecular Microbiology and Microbial Pathogenesis program. His current research in the lab of Dr. Christina Stallings focuses on drug resistance and drug tolerance in the pathogen Mycobacterium tuberculosis. He grew up just outside of Chicago and moved to St. Louis to attend Washington University in St. Louis for his undergraduate degree in molecular biology.

Visit biochem.wustl.edu/news to read more!

Congratulations to Daniel



September 15th, 2021 – **Daniel Griffith, BS**, Pre-Doc Trainee in the department of Biochemistry and Molecular Biophysics, and the laboratory of Alex Holehouse, PhD, received a new three-year Graduate Research Fellowship award from the National Science Foundation for his research entitled "***Investigating the molecular grammar driving the assembly of membraneless organelles***".

June Publication



Elias A. Tannous & Peter M. Burgers

Novel insights into the mechanism of cell cycle kinases Mec1(ATR) and Tel1(ATM)

Crit Rev Biochem Mol Biol. 2021 Jun 20;1-14. doi: 10.1080/10409238.2021.1925218. (2021)

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May Publication



Sarah R. Clippinger, Paige E. Cloonan, Wei Wang, **Lina Greenberg**, **W. Tom Stump**,
Paweorn Angsutararux, Jeanne M. Nerbonne, & **Michael J. Greenberg**

Mechanical dysfunction of the sarcomere induced by a pathogenic mutation in troponin T drives cellular adaptation

J Gen Physiol. 2021 May 3;153(5):e202012787. doi: 10.1085/jgp.202012787. (2021)

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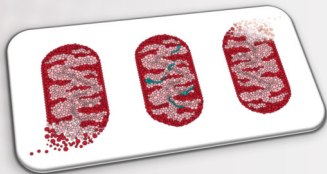
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Congratulations to Jhullian

August 23rd, 2021 – **Jhullian Jamille Alston, BA**, Pre-Doc Trainee in the department of Biochemistry and Molecular Biophysics, and the laboratories of Alex Holehouse, PhD and Andrea Soranno, PhD, received a Predoctoral to Postdoctoral Fellow Transition Award from the National Cancer Institute for his research entitled "***Single Molecule Biophysics of Intrinsically Disordered Proteins in Disease***".



Spotlight on Research




The **Niemi Lab** investigates how mitochondria are built, regulated, and maintained across physiological contexts. We blend biochemistry, systems biology, and physiology to understand mechanisms of mitochondrial regulation and how they influence metabolism and organellar function. Using insights gained from our molecular studies, we aim to understand how mitochondrial dysfunction contributes to mammalian pathophysiology, with the long-term goal of translating our discoveries into new therapeutic options to restore mitochondrial function in human disease.

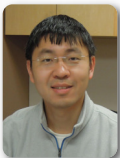
See more research:

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September Publication



Linxuan Hao, Rui Zhang, & Timothy M. Lohman

Heterogeneity in E. coli RecBCD Helicase-DNA Binding and Base Pair Melting

J Mol Biol. 2021 Sep 3;433(18):167147. doi: 10.1016/j.jmb.2021.167147. (2021)

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Congratulations to Dr. Garcia

August 24th, 2021 – **Benjamin Garcia, PhD**, Raymond H. Wittcoff Distinguished Professor and Head of Biochemistry and Molecular Biophysics, along with Matthew D. Weitzman, PhD, Professor of Microbiology, Professor of Pathology and Laboratory Medicine, University of Pennsylvania Perelman School of Medicine and Children's Hospital of Philadelphia, received a five year grant renewal from the National Institute of Allergy and Infectious Diseases for their research entitled "***Viral modulation of epitranscriptomic mechanisms***".



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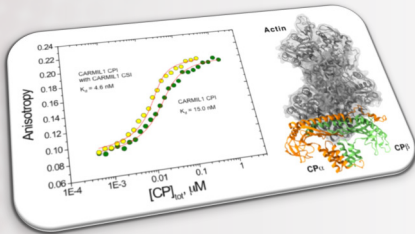
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Spotlight on Research



The **Cooper Lab** is interested in how the actin filaments in cells assemble and how that assembly controls cell shape and movement. One focus is an actin-binding protein called "capping protein," which caps one end of the actin filament. Capping protein is in turn regulated by intrinsically disordered regions of the CARMIL family of proteins, which exhibit positive linkage in their binding interactions.

See more research:
biochem.wustl.edu/spotlight

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Are you paid **monthly?**

Please remember that your **time report is
due by the 5th of each month.**

Congratulations to Dr. Galletto



September 17th, 2021 – **Roberto Galletto, PhD**, Associate Professor in the department of biochemistry and molecular biophysics was awarded a new five year MIRA grant from the National Institute of General Medical Sciences for his research entitled "***Functions of DNA helicases at hard-to-replicate sites and telomere regulation***".

Department of Biochemistry and Molecular Biophysics



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June Publication



Melanie Ernst & Janice L. Robertson

The Role of the Membrane in Transporter Folding and Activity

J Mol Biol. 2021 Jun 15;167103. doi: 10.1016/j.jmb.2021.167103. (2021)

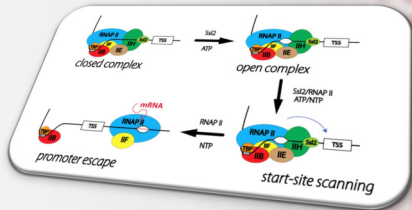
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Spotlight on Research

The **Galburt Lab** strives to understand the physical mechanisms of transcription initiation and other important DNA-protein interactions. More specifically, we use a variety of single-molecule and ensemble biophysical techniques including both optical and magnetic tweezers and fluorescent microscopy to investigate how the assembly of initiation complexes on gene promoters leads to DNA unwinding and transcription. Our work is currently focused on the mechanisms of basal transcription initiation in Eukaryotes and on factor-regulated transcription in *Mycobacterium tuberculosis*.



See more research:
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June Publication



Binh Nguyen, Min Kyung Shinn, **Elizabeth Weiland**, & **Timothy M. Lohman**

Regulation of E. coli Rep helicase activity by PriC

J Mol Biol. 2021 Jun 1;433(15):167072. doi: 10.1016/j.jmb.2021.167072. (2021)

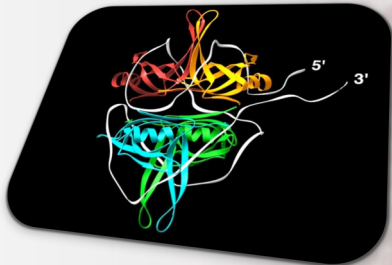
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Spotlight on Research

Research in the **Lohman Lab** focuses on obtaining a molecular understanding of the mechanisms of protein-nucleic acid interactions involved in DNA metabolism, in particular, DNA motor proteins (helicases/translocases) and single stranded DNA binding proteins. Thermodynamic, kinetic, structural and single molecule approaches are used to probe these interactions at the molecular level.



See more research:
biochem.wustl.edu/spotlight

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Congratulations to Dr. Bowman

August 17th, 2021 – **Greg Bowman, PhD**, Associate Professor of Biochemistry and Molecular Biophysics, along with Guojun Bu, Professor of Medicine and chair of the Department of Neuroscience, Mayo Clinic, received a five-year U19 Research Program – Cooperative Agreement Award from the National Institutes of Health, National Institute on Aging, entitled ***"Biology and pathobiology of apoE in aging and Alzheimer's disease"***. Dr. Bowman is leader of the project's biochemical & structural biology core.



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Jessica Kuchta-Miller – Staff/Postdoc/Graduate Student Ombuds, 314-379-8110

Karen O'Malley – Medical Student Ombuds, 314-660-2089

Jim Fehr – Faculty Ombuds, 314-660-2089

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September Publication



Nicole R. Wong, Jay Mohan, Benjamin J. Kopecky, Shuchi Guo, Lixia Du, Jamison Leid, Guoshuai Feng, Inessa Lokshina, Oleksandr Dmytrenko, Hannah Luehmann, Geetika Bajpai, Laura Ewald, Lauren Bell, Nikhil Patel, Andrea Bredemeyer, Carla J. Weinheimer, Jessica M. Nigro, Attila Kovacs, Sachio Morimoto, Peter O. Bayguinov, Max R. Fisher, **W. Tom Stump**, **Michael Greenberg**, James A. J. Fitzpatrick, Slava Epelman, Daniel Kreisel, Rajan Sah, Yongjian Liu, Hongzhen Hu, & Kory J. Lavine

Resident cardiac macrophages mediate adaptive myocardial remodeling

Immunity. 2021 Sep 14;54(9):2072-2088.e7. doi: 10.1016/j.immuni.2021.07.003. (2021)

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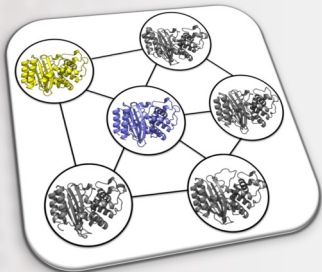
**Congratulations to Jasmine Cubuk for being selected for the 2021 Elson
Fellowship in honor of Dr. Elliot Elson**



Jasmine is a fifth-year graduate student in the Biochemistry, Biophysics, and Structural Biology (BBSB) program. She is doing her PhD thesis work in the lab of Dr. Andrea Soranno, where she studies how sequence composition of intrinsically disordered regions within a protein can affect interactions with both proteins and nucleic acids using single-molecule fluorescence spectroscopy.

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Spotlight on Research



The **Bowman Lab** seeks to understand the distribution of different structures a protein adopts and how this ensemble determines a protein's function. Examples of ongoing research projects include 1) understanding how mutations in the enzyme beta-lactamase change its specificity without changing the protein's crystal structure, 2) designing allosteric drugs, and 3) developing algorithms for quickly building models of the different structures a protein adopts.

See more research:

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August Publication



Yanniv Dorone, Steven Boeynaems, Eduardo Flores, Benjamin Jin, Shannon Hateley, Flavia Bossi, Elena Lazarus, Janice G. Pennington, Emiel Michiels, Mathias De Decker, Katlijn Vints, Pieter Baatsen, George W. Bassel, Marisa S. Otegui, **Alex S. Holehouse**, Moises Exposito-Alonso, Shahar Sukenik, Aaron D. Gitler, Seung Y. Rhee

A prion-like protein regulator of seed germination undergoes hydration-dependent phase separation

Cell. 2021 Aug 5;184(16):4284-4298.e27. doi: 10.1016/j.cell.2021.06.009. (2021)

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Holiday Schedule

Holiday	Day Observed	Date Observed at WashU
Thanksgiving	Thursday	November 25th, 2021
Day after Thanksgiving	Friday	November 26th, 2021
Christmas Eve	Friday	December 24 th , 2021
Christmas Day	Monday	December 27 th , 2021
New Year's Eve	Friday	December 31 st , 2021
New Year's Day	Monday	January 3 rd , 2022



Congratulations to Dr. Janetka

September 30th, 2021 – **Jim Janetka, PhD**, Professor of Biochemistry and Molecular Biophysics, Makedonka Mitreva, Professor of Medicine and Genetics, and Sara Lustigman, Professor and Head, Laboratory of Molecular Parasitology Member, Lindsley F. Kimball Research Institute, New York Blood Center have received a new multi-PI R01 award from the National Institutes of Health, National Eye Institute entitled "***Integrative approach for accelerating filarial worm drug discovery to treat river blindness***".

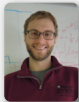


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July Publication



Maxwell I. Zimmerman, Justin R. Porter, Michael D. Ward, Sukrit Singh, Neha Vithani, Artur Meller, Upasana L. Mallimadugula, Catherine E. Kuhn, Jonathan H. Borowsky, Rafal P. Wiewiora, Matthew F. D. Hurley, Aoife M. Harbison, Carl A. Fogarty, Joseph E. Coffland, Elisa Fadda, Vincent A. Voelz, John D. Chodera, & **Gregory R. Bowman**

SARS-CoV-2 simulations go exascale to predict dramatic spike opening and cryptic pockets across the proteome

Nat Chem. 2021 Jul;13(7):651-659. doi: 10.1038/s41557-021-00707-0. (2021)

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COVID-19



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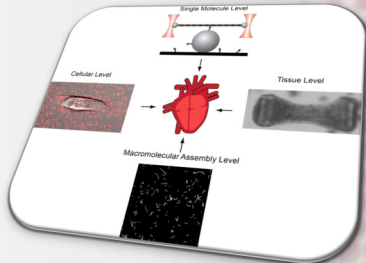
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Spotlight on Research

The **Greenberg Lab** focuses on how cytoskeletal motors function in both health and disease. Currently, the lab is studying mutations that cause familial cardiomyopathies, the leading cause of sudden cardiac death in people under 30 years old. The lab uses an array of biochemical, biophysical, and cell biological techniques to decipher how these mutations affect heart contraction from the level of single molecules to the level of engineered tissues. Insights into the disease pathogenesis will guide efforts to develop novel therapies.



See more research:

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Congratulations to Dr. Burgers



May 14th, 2021 - **Peter M. Burgers, PhD**, Marvin A. Brennecke Professor of Biological Chemistry, department of biochemistry and molecular biophysics was awarded a five-year MIRA grant renewal from the National Institute of General Medical Sciences for his research entitled ***"Mechanisms of DNA replication and maintenance in eukaryotes"***.

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June Publication



George R. Heath, Ekaterina Kots, **Janice L. Robertson**, Shifra Lansky, George Khelashvili, Harel Weinstein, & Simon Scheuring

Localization atomic force microscopy

Nature. 2021 Jun;594(7863):385-390. doi: 10.1038/s41586-021-03551-x. (2021)

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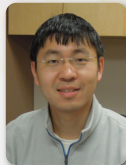
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Congratulations



August 17th, 2021 – **Andrea Soranno, PhD**, Assistant Professor of Biochemistry and Molecular Biophysics, **Carl Frieden, PhD**, Professor of Biochemistry and Molecular Biophysics, and **Rui Zhang, PhD**, Assistant Professor of Biochemistry and Molecular Biophysics will collaborate in the Project named "***ApoE isoform-specific structure: insights on biology and pathobiology***".

The Project is part of the newly awarded five-year U19 Research Program from the National Institutes of Health, National Institute of Aging, entitled "Biology and pathobiology of apoE in aging and Alzheimer's disease", helmed by Dr. David Holtzman, Professor and Chair of the Department of Neurology at Washington University, in St Louis, and Dr. Guojun Bu, Professor of Medicine and Chair of the Department of Neuroscience, Mayo Clinic.

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September Publication



Daniel Griffith & Alex S. Holehouse

PARROT is a flexible recurrent neural network framework for analysis of large protein datasets

Elife. 2021 Sep 17;10:e70576. doi: 10.7554/eLife.70576. (2021)

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Don't Forget!



**Please keep your lab
locked if no one is in
there when you leave.**

**Don't forget your
keys!**

**Please remember to
take OFF your gloves
when leaving the lab.**



August Publication



Fengbo Zhou, Yihu Yang, Saketh Chemuru, Weidong Cui, **Shixuan Liu**, Michael Gross, & **Weikai Li**

Footprinting Mass Spectrometry of Membrane Proteins: Ferroportin Reconstituted in Saposin A Picodiscs

Anal Chem. 2021 Aug 24;93(33):11370-11378. doi: 10.1021/acs.analchem.1c02325. (2021)

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Congratulations to Dr. Robertson



August 2nd, 2021 – **Janice L Robertson, PhD**, assistant professor of biochemistry and molecular biophysics received a four year renewal from the National Institute of General Medical Sciences for her research entitled "***Driving forces of membrane protein assembly in membranes***".

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