

# Welcome to the Department of Biochemistry and Molecular Biophysics

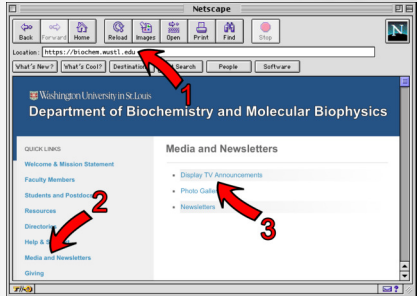


Washington University in St. Louis  
School of Medicine

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# April Publication



Jie Sun, **Weikai Li**, & Michael L. Gross

## ***Advances in mass spectrometry-based footprinting of membrane proteins***

Proteomics. 2022 Apr;22(8):e2100222. doi: 10.1002/pmic.202100222. (2022)

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**“How many biophysicists can you name?”**

Gordon Research Conference  
June 28<sup>th</sup> - July 2<sup>nd</sup>, 1976

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# Congratulations to Dr. Greenberg

July 1<sup>st</sup>, 2022 – **Michael Greenberg, PhD**, Associate Professor of Biochemistry and Molecular Biophysics along with Kory J. Lavine, MD PhD, Associate Professor of Medicine and Nathaniel D. Huebsch, PhD, Assistant Professor of Biomedical Engineering have received a new three-year grant award from American Heart Association for their research entitled ***"Human heart-on-a-chip to study the immune system in cardiac disease pathogenesis and repair"***.



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# March Publication



**Upasana L. Mallimadugula & Eric A. Galburt**

***Parallel path mechanisms lead to nonmonotonic force-velocity curves and an optimum load for molecular motor function***

Phys Rev E. 2022 Mar;105(3-1):034405. doi: 10.1103/PhysRevE.105.034405. (2022)

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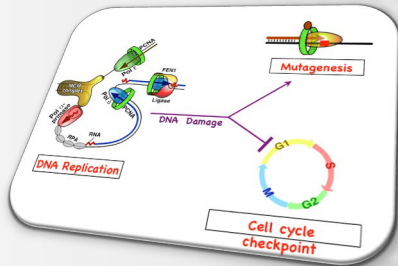
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# Spotlight on Research

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](http://biochem.wustl.edu/spotlight)

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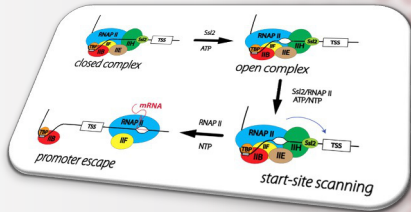
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# Spotlight on Research

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:  
[biochem.wustl.edu/spotlight](http://biochem.wustl.edu/spotlight)

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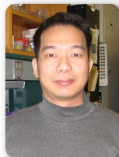
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# March Publication



**Alexander G. Kozlov**, Xian Cheng, Hongshan Zhang, Min Kyung Shinn, **Elizabeth Weiland**, **Binh Nguyen**, Irina A. Shkel, Emily Zytkeiwicz, Ilya J. Finkelstein, M. Thomas Record Jr., & **Timothy M. Lohman**

***How Glutamate Promotes Liquid-liquid Phase Separation and DNA Binding Cooperativity of E. coli SSB Protein***

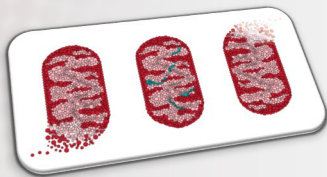
J Mol Biol. 2022 Mar 26;434(9):167562. doi: 10.1016/j.jmb.2022.167562. (2022)

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# 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:  
[biochem.wustl.edu/spotlight](https://biochem.wustl.edu/spotlight)

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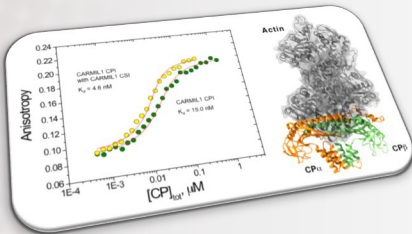
**[BMBSupport.wustl.edu/backups](http://BMBSupport.wustl.edu/backups)**



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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](http://biochem.wustl.edu/spotlight)

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**Are you paid **monthly**?**

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**due by the 5th of each month.****



# Congratulations to Dr. Galburt



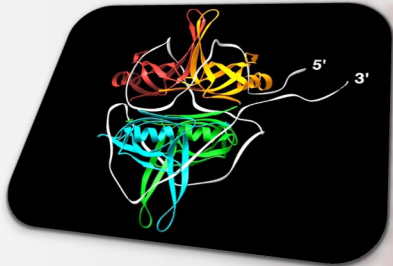
March 2<sup>nd</sup>, 2022 – **Eric Galburt, PhD**, Associate Professor in Biochemistry and Molecular Biophysics, received a new five-year MIRA grant award from National Institute of General Medical Sciences for his research entitled ***"Molecular Mechanisms of Transcription Initiation and DNA Repair"***.

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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](http://biochem.wustl.edu/spotlight)

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Contact any of the following for help

Jessica Kennedy – Title IX Director, [jwkennedy@wustl.edu](mailto:jwkennedy@wustl.edu), 314-935-3118

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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**Congratulations to Anna Damato for being selected as the  
2022 Ceil M. DeGutis Prize Fellow**



Anna Damato is a fifth-year PhD candidate in Neuroscience in the Department of Biology. Anna was nominated for this award by her thesis mentor, Dr. Erik Herzog, in whose lab she is connecting the bench to the bedside by investigating mechanisms of glioblastoma brain tumor circadian rhythms and how they impact the efficacy of chemotherapy. Anna uses real-time bioluminescence reporters of circadian gene expression to analyze the effects of timed treatment, with the goal of maximizing anti-tumor effects and minimizing side effects of chemotherapy in treating an otherwise dismal disease.

Visit [biochem.wustl.edu/news](https://biochem.wustl.edu/news) to read more!

# Congratulations

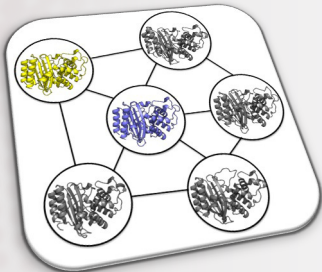


April 22<sup>nd</sup>, 2022 – **Andrea Soranno, PhD**, Assistant Professor of Biochemistry and Molecular Biophysics along with **Kathleen Hall, PhD**, Professor of Biochemistry and Molecular Biophysics and **Alex Holehouse, PhD**, Assistant Professor of Biochemistry and Molecular Biophysics have received a new five-year grant from National Institute of Allergy and Infectious Diseases for their research entitled "***A multipronged investigation of SARS-CoV-2 genome packaging***"

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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:

[biochem.wustl.edu/spotlight](http://biochem.wustl.edu/spotlight)

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# Holiday Schedule

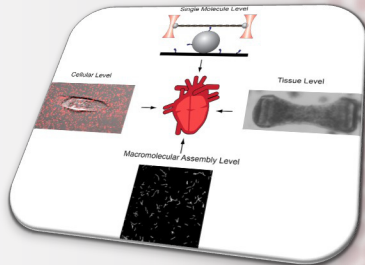
Holiday	Day Observed	Date Observed at WashU
Independence Day	Monday	July 4 <sup>th</sup> , 2022
<b>Labor Day</b>	<b>Monday</b>	<b>September 5<sup>th</sup>, 2022</b>
Thanksgiving Day	Thursday	November 24 <sup>th</sup> , 2022
Day after Thanksgiving	Friday	November 25 <sup>th</sup> , 2022
Christmas Eve	Friday	December 23 <sup>rd</sup> , 2022
Christmas Day	Monday	December 26 <sup>th</sup> , 2022





# 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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and works in progress

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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.**

