Welcome to the Department of Biochemistry and Molecular Biophysics

Washington University in St. Louis
School of Medicine

https://biochem.wustl.edu
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2) Click Media and Newsletters
3) Click Display TV Announcements

View these slides online!
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)
A Troponin T Variant Linked with Pediatric Dilated Cardiomyopathy Reduces the Coupling of Thin Filament Activation to Myosin and Calcium Binding

Congratulations

April 15th, 2021 – Linda J. Pike, PhD, Professor of Biochemistry and Molecular Biophysics, along with Alexander S. Holehouse, PhD, Assistant Professor of Biochemistry and Molecular Biophysics, and Gary J. Patti, PhD, Professor of Chemistry and of Genetics and Medicine, received a new four year grant award from the National Institute of General Medical Sciences for their research entitled “Intrinsic Disorder and Agonist Bias in EGF Receptor Signaling”.
Mattia Bernetti, Kathleen B. Hall, & Giovanni Bussi

Reweighting of molecular simulations with explicit-solvent SAXS restraints elucidates ion-dependent RNA ensembles

For the latest updates on coronavirus (COVID-19), please visit here:

https://coronavirus.wustl.edu

Don’t forget to self-screen before coming into work!

https://screening.wustl.edu
Elias A. Tannous & Peter M. Burgers

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

Computer not working?
Not getting email on your smartphone?

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Support email: support@biochem.wustl.edu

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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
Membrane transporter dimerization driven by differential lipid solvation energetics of dissociated and associated states

Are you paid **monthly**?

Please remember that your **time report is due by the 5th of each month**.
Denis A. Kiktev, Margaret Dominska, Tony Zhang, Joseph Dahl, Elena I. Stepchenkova, Piotr Mieczkowski, Peter M. Burgers, Scott Lujan, Adam Burkholder, Thomas A. Kunkel, & Thomas D. Petes

The fidelity of DNA replication, particularly on GC-rich templates, is reduced by defects of the Fe-S cluster in DNA polymerase δ

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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Melanie Ernst & Janice L. Robertson

The Role of the Membrane in Transporter Folding and Activity

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

Regulation of E. coli Rep helicase activity by PriC

HAVING ISSUES AT WORK? WE’RE HERE TO HELP.

Contact any of the following for help

John Cooper,  Department Head, jcooper11@gmail.com, 314-362-3964
Jessica Kennedy – Title IX Director, 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
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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**bmbid.wustl.edu**
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)

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

## Holiday Schedule

<table>
<thead>
<tr>
<th>Holiday</th>
<th>Day Observed</th>
<th>Date Observed at WashU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independence Day</td>
<td>Monday</td>
<td>July 5(^{\text{th}}), 2021</td>
</tr>
<tr>
<td><strong>Labor Day</strong></td>
<td>Monday</td>
<td>September 6(^{\text{th}}), 2021</td>
</tr>
<tr>
<td>Thanksgiving</td>
<td>Thursday</td>
<td>November 25(^{\text{th}}), 2021</td>
</tr>
<tr>
<td>Day after Thanksgiving</td>
<td>Friday</td>
<td>November 26(^{\text{th}}), 2021</td>
</tr>
<tr>
<td>Christmas Eve</td>
<td>Friday</td>
<td>December 24(^{\text{th}}), 2021</td>
</tr>
<tr>
<td>Christmas Day</td>
<td>Monday</td>
<td>December 27(^{\text{th}}), 2021</td>
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coronavirus.wustl.edu

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screening.wustl.edu
BMB SCIENCE FRIDAYS

a forum for new data, new ideas
and works in progress

Science Fridays and Happy Hour:
EVERY FRIDAY, starting at 4PM.

A novel class of TMPRSS2 inhibitors potently block SARS-CoV-2 and MERS-CoV viral entry and protect human epithelial lung cells

bioRxiv. 2021 May 6;2021.05.06.442935. doi: 10.1101/2021.05.06.442935. (2021)
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”.
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: biochem.wustl.edu/spotlight
June Publication

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

*Localization atomic force microscopy*

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.

Department of Biochemistry and Molecular Biophysics
Washington University in St. Louis • School of Medicine
Michael D. Ward, Maxwell I. Zimmerman, Artur Meller, Moses Chung, S. J. Swamidass, & Gregory R. Bowman

Deep learning the structural determinants of protein biochemical properties by comparing structural ensembles with DiffNets