

Welcome to the Department of Biochemistry and Molecular Biophysics

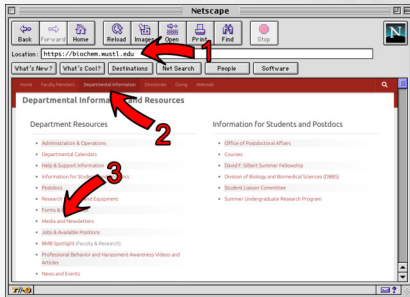


Washington University in St. Louis
School of Medicine

<https://biochem.wustl.edu>

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March Publication



Min Kyung Shinn, **Sumit K. Chaturvedi**, **Alexander G. Kozlov**, & **Timothy M. Lohman**

Allosteric effects of *E. coli* SSB and RecR proteins on RecO protein binding to DNA

Nucleic Acids Res. 2023 Mar 21;51(5):2284-2297. doi: 10.1093/nar/gkad084. (2023)

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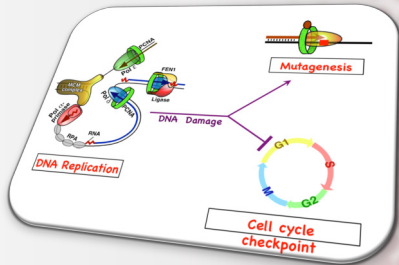
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Spotlight on Research

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



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Congratulations to Dr. Holehouse



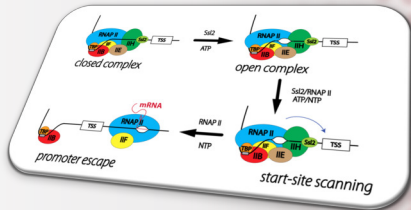
Oct 1st 2022 - **Alex Holehouse**, assistant professor of biochemistry and molecular biology has received more than \$450,000 in funding from the National Science Foundation (NSF) to lead a five-year project titled ***"Molecular engineering to understand desiccation protection and water responsiveness."*** The project is part of a larger grant called "Life without water: protecting macromolecules, cells, and organisms during desiccation and rehydration across kingdoms of life." This grant establishes the Water and Life Interface Institute led by Carnegie Science. The new initiative includes collaborators from at least nine research institutions nationwide.

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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*.



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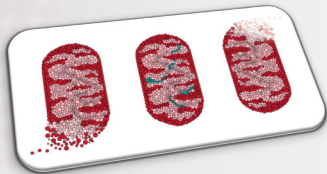
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Spotlight on Research




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

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October Publication



Garrett M. Ginell & **Alex S. Holehouse**

An Introduction to the Stickers-and-Spacers Framework as Applied to Biomolecular Condensates

Methods Mol Biol. 2023;2563:95-116. doi: 10.1007/978-1-0716-2663-4_4. (2022)

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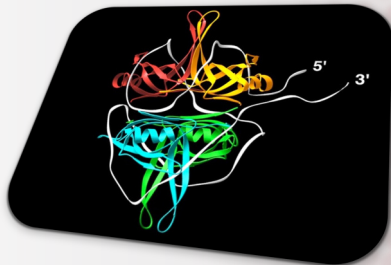
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Spotlight on Research

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:
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HAVING ISSUES AT WORK? WE'RE HERE TO HELP.

Contact any of the following for help

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

Congratulations to Dr. Holehouse

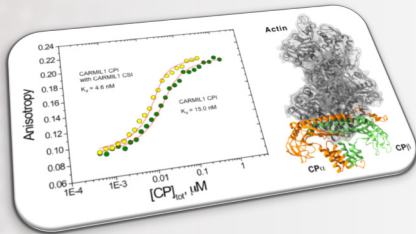
Oct 1st 2022 – **Alex Holehouse**, assistant professor of biochemistry and molecular has received \$380,000 in funding from the Human Frontiers Science Program (HFSP) to lead a three-year project titled "***Molecular determinants of evolutionary conservation in disordered protein regions***". This project will integrate computational and experimental approaches to uncover who intrinsically disordered protein regions evolve. The proposal involves co-investigators Dr. Hyun Kate Lee (University of Toronto, CA) and Dr. Dolf Weijers (Wageningen University, NL).



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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:
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December Publication



Zev J. Greenberg, Darlene Monlish, Luana Chiquetto Paracatu, Qian Dong, Michael P. Rettig, Nate Dee Roundy, Rofaida Gaballa, **Weikai Li**, Wei Yang, Cliff J. Luke, & Laura Schuettpelz

The tetraspanin CD53 protects stressed hematopoietic stem cells via promotion of DREAM complex- mediated quiescence

Blood. 2022 Dec 21;blood.2022016929. doi: 10.1182/blood.2022016929. (2022)

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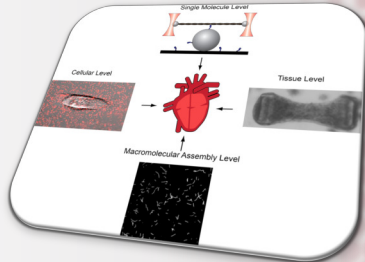
Holiday Schedule

Holiday	Day Observed	Date Observed at WashU
Martin Luther King, Jr.	Monday	January 16 th , 2023
Memorial Day	Monday	May 29 th , 2023
Independence Day	Tuesday	July 4th, 2023
Labor Day	Monday	September 4 th , 2023
Thanksgiving	Thursday	November 23 rd , 2023
Day after Thanksgiving	Friday	November 24 th , 2023




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.



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