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Memorial Sloan Kettering
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MOLECULAR BIOLOGY PROGRAM

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Xiaolan Zhao, PhD

DNA replication, repair, and damage response, collectively called the 3Rs, support genome stability and faithful genetic inheritance. Proteins involved in the 3Rs are genome guardians that prevent a broad spectrum of diseases, ranging from cancers, immunological and neurodegenerative diseases, to developmental disorders such as diabetes and premature aging. Our lab investigates 3R mechanisms, 3R protein functions and structures, and their links to human disease. Our main research interests include:

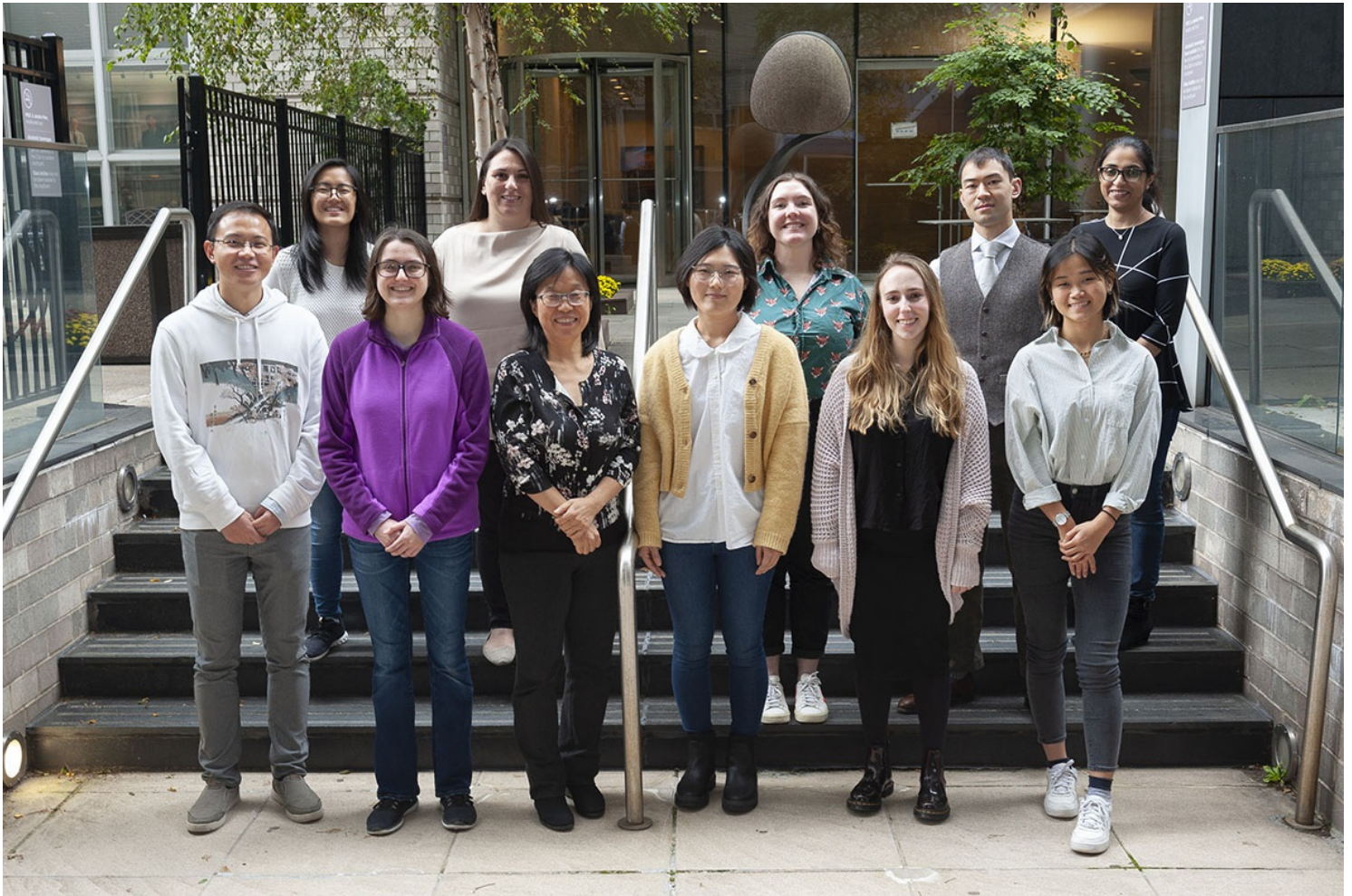
- Mechanisms of genome duplication during growth and under stress conditions that mimics carcinogenic exposure or chemotherapeutic treatment.
- DNA repair processes that restore genetic information perturbed by a variety of DNA lesions arising from genotoxic

exposures.

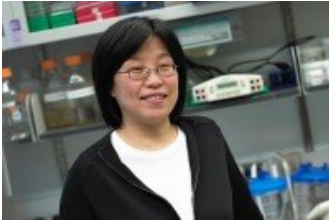
- The DNA damage response systems that monitor genome lesion burdens and deploy signaling pathways to induce multifaceted physiological changes, ranging from metabolic and epigenetic changes, cell cycle delays, to chromosomal organization and maintenance adjustments.

To illuminate 3R processes and genome guardian functions, we have implemented cutting-edge and multi-disciplinary approaches, including genetic, biochemical, cell biological, structural, and genomic strategies. Our broad research scope and approaches provide lab members ample opportunities to explore and discover new biological principles. Our lab also offers a nurturing and supportive environment with tailored mentoring and training to advance lab members' abilities in research, writing, presentation, and leadership.

[View Lab Overview](#) →



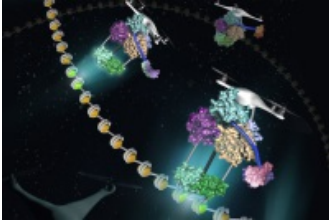
Featured News



[At Work: Molecular Biologist Xiaolan Zhao](#)

Molecular biologist Xiaolan Zhao explores molecular mechanisms that will help scientists better understand how human cells work.

IN THE LAB



[“Molecular Origami” Enables Proteins to Serve as Specialized Delivery Vehicles, Study Finds](#)

Scientists at the Sloan Kettering Institute have identified a fundamentally new type of protein-sorting system in cells.

IN THE NEWS



[10 Remarkable Basic Science Breakthroughs from 2019](#)

As 2019 comes to an end, take a moment to reflect on the science stories that made the year one to remember.

Publications Highlights

Selected Papers in the Past 5 years

Fan J, Dhingra N, Yang T, Yang V, Zhao X (2024) [Srs2 binding to PCNA and its sumoylation contribute to RPA antagonism during the DNA damage response](#) *bioRxiv* 2024.03.28.587206.

Zhao R, Xu M, Wondisford AR, Lackner RM, Salsman J, Dellaire G, Chenoweth DM, O'Sullivan RJ, Zhao X, Zhang H (2024). [SUMO Promotes DNA Repair Protein Collaboration to Support Alternative Telomere Lengthening in the Absence of PML](#). *bioRxiv* 2024.02.29.582813.

O'Leary DR, Hansen AR, Fingerman DR, Tran T, Harris BR, Hayer KE, Fan J, Chen, E Tennekoon M, DeWeerd RA, Meroni A, Szeto JH, Weitzman MD, Shalem O, Bednarski J, Vindigni A, Zhao X Green AM (2024) [The SMC5/6 complex is required for maintenance of genome integrity upon APOBEC3A-mediated replication stress](#). *bioRxiv* 2023.11.28.568952.

Huang W, Qiu F, Zheng L, Shi M, Shen M, ZhaoX, Xiang S (2023) [Structural insights into Rad18 targeting by the SLF1 BRCT domains](#). *J Biol Cell* 299:105288

Li S, You Y, Zheng J, Miller-Browne V, Ser Z, Kuang H, Patel D, Zhao X (2023) [Molecular basis for Nse5-6 mediated regulation of Smc5/6 functions](#) *Proc Natl Acad Sci USA* 120:e2310924120.

[View All Publications](#)

People



Xiaolan Zhao, PhD

Molecular biologist Xiaolan Zhao studies chromosomal organization, genome integrity, DNA replication and repair, dynamic protein modification.

PhD, Columbia University

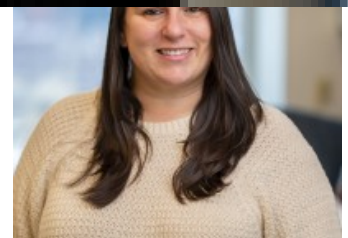
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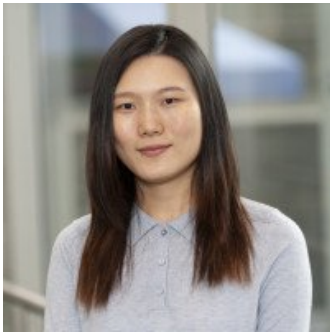
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Members



Nicole Clerico-
Benn

Assistant to Chair



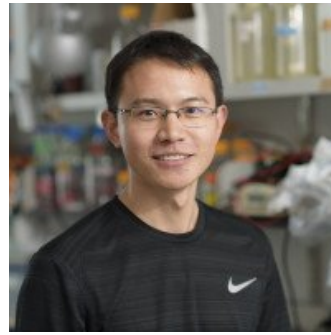
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Research Associate



Rebecca Lever

Research Fellow



Shibai Li

Senior Research Scientist

Sofya Ignatyeva

Undergraduate
Researcher

Doston

Karimov

Undergraduate
Researcher

Lab Alumni

+

Lab Affiliations

+

Achievements

Bressler Scholar, Alfred W. Bressler Scholar Endowment Fund

Research Scholar, American Cancer Society

Scholar, Leukemia & Lymphoma Society

Discovery of the extensive SUMO-based DNA damage response

Discovery of the connection between the nuclear pore complex and desumoylation

Read more

+

Lab News & Events

ACCOLADES

Team Recognitions

Congratulations to Tzipora who was awarded the Kravis WiSE fellowship!

Congrats to Cory who was awarded an NIH Postdoctoral Fellowship and Best Photo Award from Postdoc Association in 2023

Cheers to Tzipora! She received honorable mention for the NSF grant

Victoria won Faculty Choice for best poster

award at the BCMB Retreat in 2023 and
People's Choice in 2022! Great Job!

Congrats to our lab for being awarded the
following grants: BRIA (2023), CER (2022),
Geoffrey Beene (2021)

[Lab fun and activities](#)

Open Positions

To learn more about available postdoctoral opportunities, please visit our [Career Center](#)

To learn more about compensation and benefits for postdoctoral researchers at MSK, please visit [Resources for Postdocs](#)

Postdoctoral, Graduate Student, & Technician Positions

Positions are available for postdoctoral fellows, graduate students, and technicians in the research group of Dr. Xiaolan Zhao.

[Apply now](#) →

Get in Touch

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Disclosures

Doctors and faculty members often work with pharmaceutical, device, biotechnology, and life sciences companies, and other organizations outside of MSK, to find safe and effective cancer treatments, to improve patient care, and to educate the health care community.

MSK requires doctors and faculty members to report (“disclose”) the relationships and financial interests they have with external entities. As a commitment to transparency with our community, we make that information available to the public.

Xiaolan Zhao discloses the following relationships and financial interests:

Biochemical Society

Professional Services and Activities (Uncompensated)

Cold Spring Harbor Laboratory

Professional Services and Activities

FASEB

Professional Services and Activities (Uncompensated)

Fusion Conferences

Professional Services and Activities (Uncompensated)

Gordon Research Conferences

Professional Services and Activities (Uncompensated)

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This page and data include information for a specific MSK annual disclosure period (January 1, 2022 through disclosure submission in spring 2023). This data reflects interests that may or may not still exist. This data is updated annually.

Learn more about MSK's COI policies [here](#). For questions regarding MSK's COI-related policies and procedures, email MSK's Compliance Office at ecoi@mskcc.org.

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