



Gerstner Sloan Kettering
Graduate School of Biomedical Sciences

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MOLECULAR BIOLOGY PROGRAM

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The Xiaolan Zhao Lab

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Xiaolan Zhao, PhD

Professor

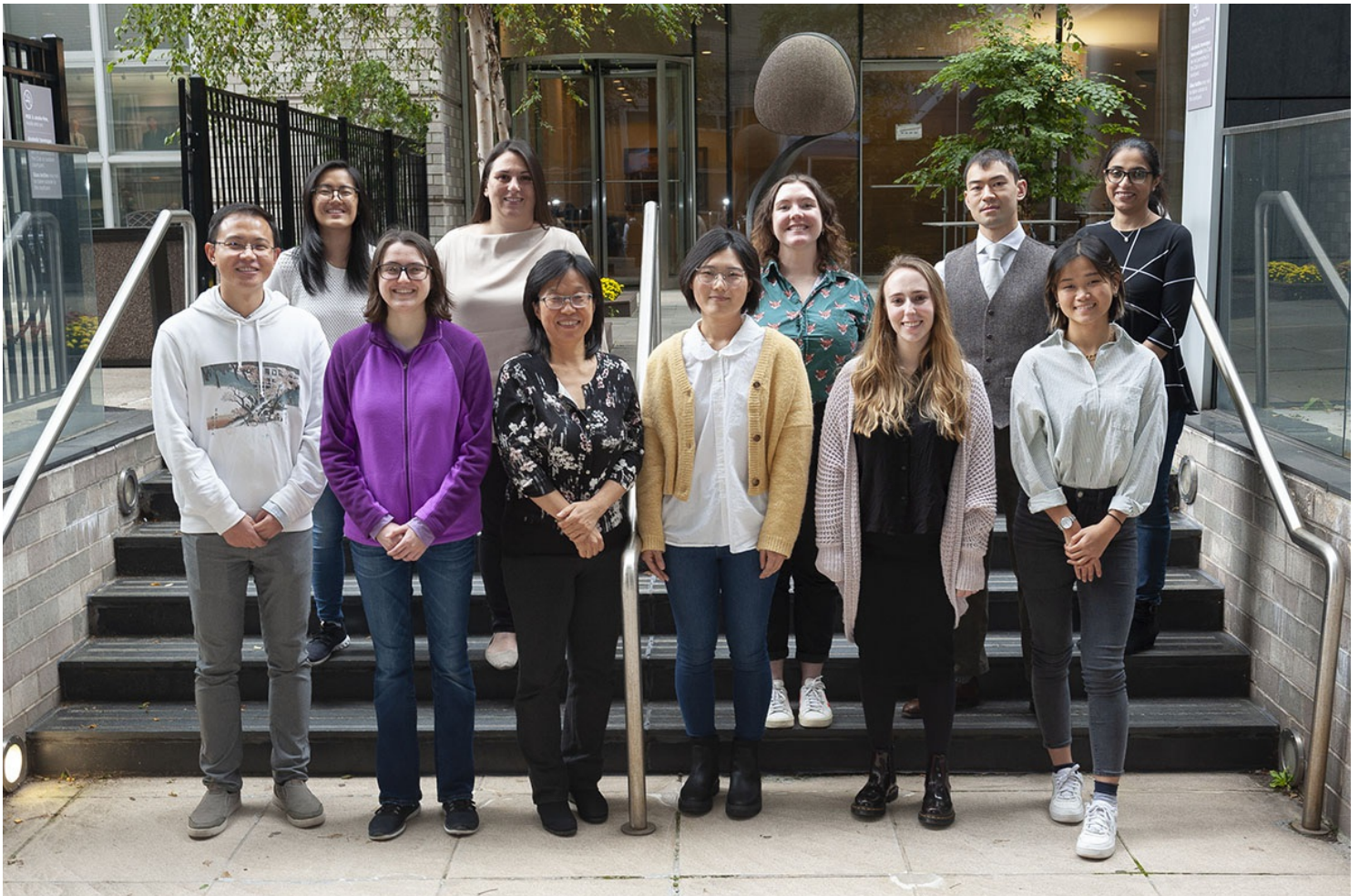
DNA replication, repair, and damage response, collectively called the 3Rs, support genome stability and faithful genetic inheritance. Proteins involved in the 3Rs are genome guardians that prevent a broad spectrum of diseases, ranging from cancers, immunological and neurodegenerative diseases, to developmental 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:

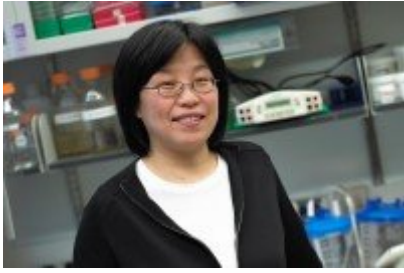
- Mechanisms of genome duplication during growth and under stress conditions that mimics carcinogenic exposure or chemotherapeutic treatment.
- DNA repair processes that restore genetic information perturbed by a variety of DNA lesions arising from genotoxic exposures.
- The DNA damage response systems that monitor genome lesion burdens and deploy signaling pathways to induce multi-faceted 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](#) →



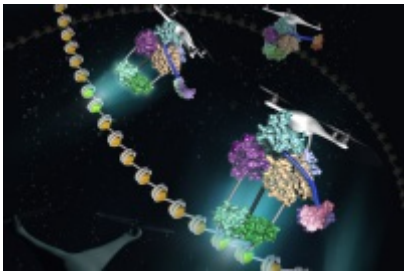
Featured News



[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

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

[Huang W, Qiu F, Zheng L, Shi M, Shen M, Zhao X, Xiang S. \(2023\). Structural insights into Rad18 targeting by the SLF1 BRCT domains. *J Biol Chem*. Epub ahead of print.](#)

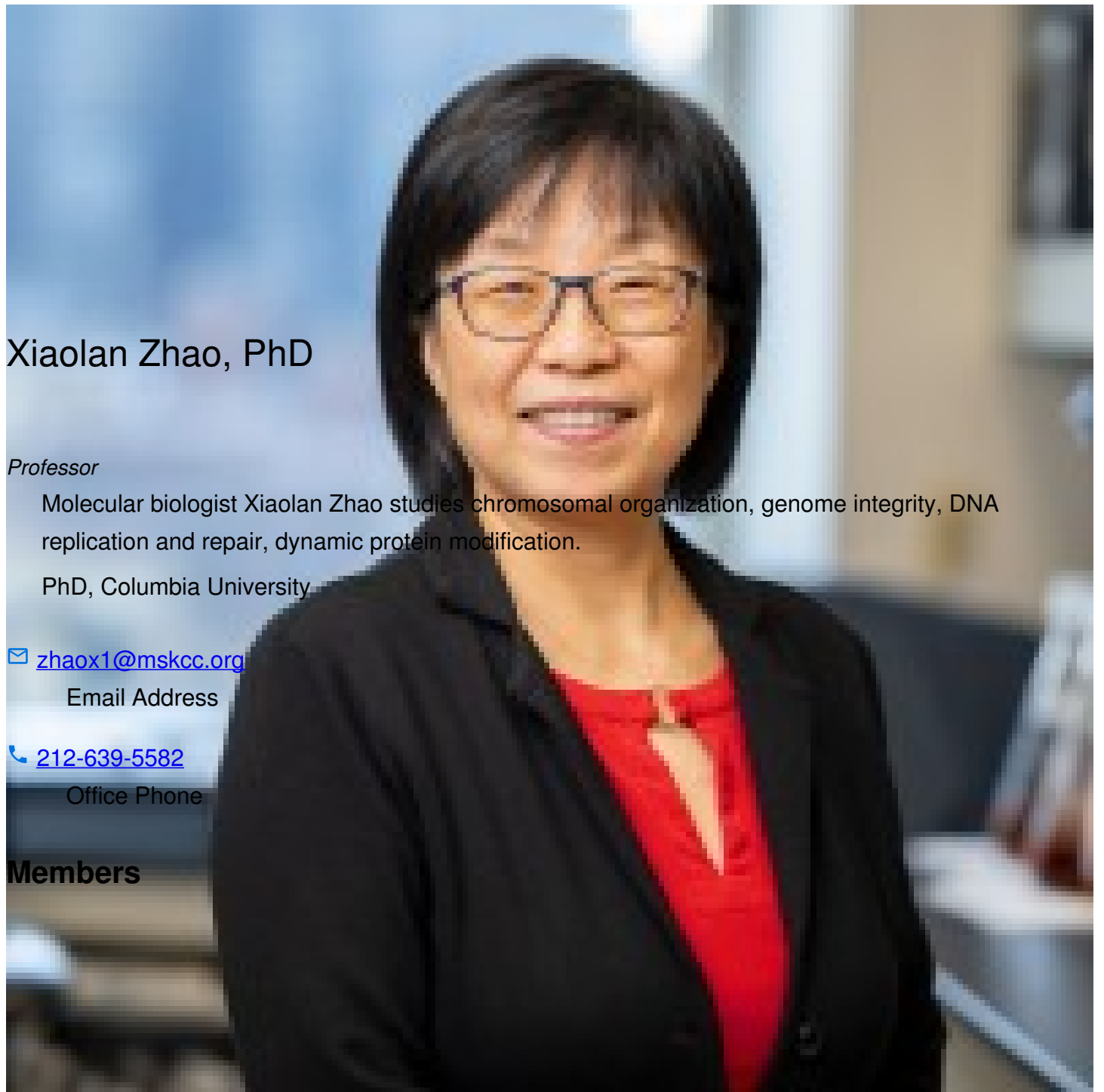
[Peng XP, Zhao X. \(2023\). The multi-functional Smc5/6 complex in genome protection and disease. *Nat Struct Mol Biol*. 30:724-734.](#)

[Meng X, Claussin C, Regan-Mochrie G, Whitehouse I, Zhao X. \(2023\). Balancing act of a leading strand DNA polymerase-specific domain and its exonuclease domain promotes genome-wide sister replication fork symmetry. *Genes Dev*. 37:74-79.](#)

[Chang JT, Li S, Beckwitt E, Than T, Haluska C, Chandanani J, O'Donnell ME, Zhao X*, Liu S* \(*co-corresponding authors\). \(2022\). Smc5/6's multi-faceted DNA binding capacities stabilize branched DNA structures. *Nat Commun*. 13:7179.](#)

[View All Publications](#)

People



Xiaolan Zhao, PhD

Professor

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

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Browne

Graduate Student (BCMB)



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Jian
Zheng

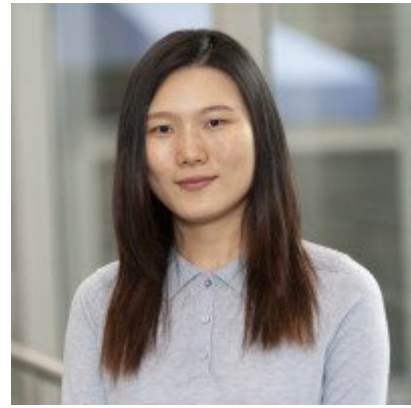
Graduate Student (BCMB)



Cory Haluska
Research Fellow



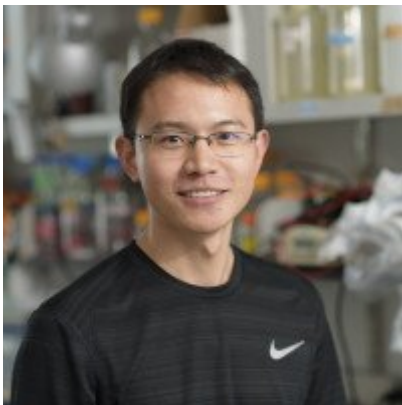
Nicole Clerico-
Benn
SKI Senior Admin
Assistant



Jiayi Fan
Research Associate



Rebecca Lever
Research Fellow



Shibai Li
Senior Research Scientist

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)

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](#) →

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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.

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