



Gerstner Sloan Kettering
Graduate School of Biomedical Sciences

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MOLECULAR BIOLOGY PROGRAM

The Scott Keeney Lab

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Scott Keeney, PhD

Member, Molecular Biology Program, SKI; Investigator, Howard Hughes Medical Institute; Frederick R. Adler Chair

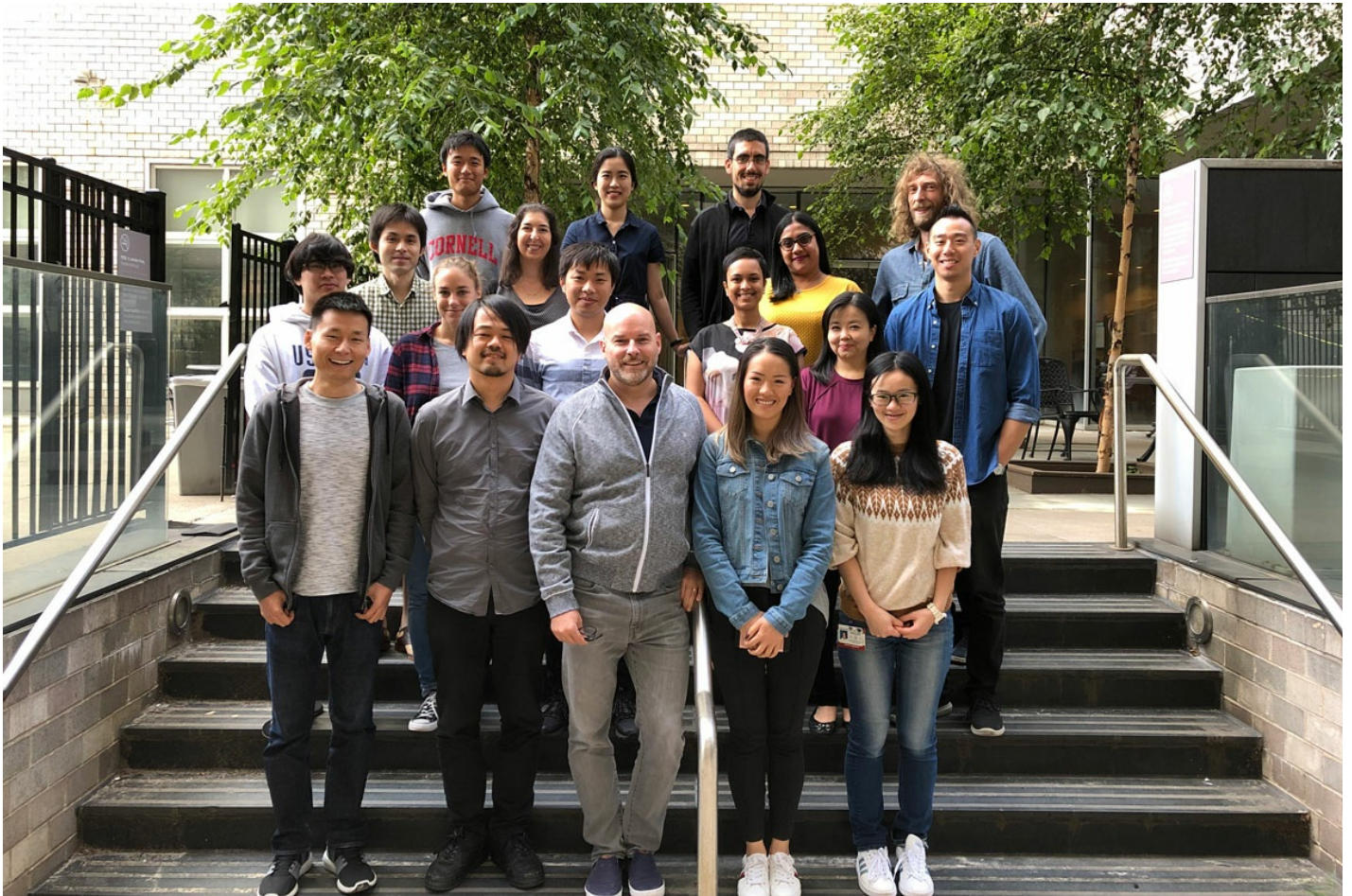
Professor

The long-range objectives of our research are to understand the mechanism of meiotic recombination and to determine how this process is coordinated with other events of meiotic prophase. Several projects in the lab focus on Spo11 (the protein that makes the DNA double-strand breaks (DSBs) that initiate recombination), the proteins that interact with Spo11, the interactions of these proteins with meiotic chromosomes, and the mechanisms that regulate the timing, number, and location of DSB formation. We also study how DSBs are processed and repaired and we are seeking to expand knowledge of meiotic processes more generally through discovery of new genes important for germ cell function. Most of the meiosis research in the lab uses the yeast *Saccharomyces cerevisiae* and the mouse. Finally, our studies of Spo11 have also provided an entry point to research on the DSBs made by the enzyme Topoisomerase II when it is inhibited by chemotherapeutic agents such as etoposide or doxorubicin.

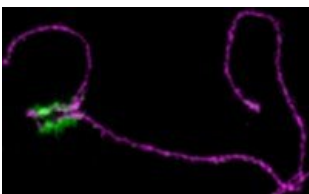
[View Lab Overview \(https://www.sloankettering.edu/research-areas/labs/scott-keeney/overview\)](https://www.sloankettering.edu/research-areas/labs/scott-keeney/overview)

Research Projects

- [Meiotic Recombination in the Yeast *S. cerevisiae*](#)
- [Meiotic Recombination in the Mouse](#)
- [Topoisomerase II in tumorigenesis and cytotoxic chemotherapy](#)



Featured News



IN THE LAB

[Breaking Up Is Hard to Do \(Especially for Sex Chromosomes\)](#)

One's big, one's small. Somehow, they make it work.



[At Work: Molecular Biologist Scott Keeney](#)

Molecular biologist Scott Keeney studies the molecular mechanisms that make germ cell tumors responsive or resistant to chemotherapy.



FEATURE

[Out of the Closet, into the Lab: Five LGBTQ Scientists Share Their Stories](#)

What's it like being LGBTQ in the world of science? We asked some MSK scientists to find out.

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Publications Highlights

[Yu Y, Wang J, Liu K, Zheng Z, Arter M, Claeys Bouuaert C, Pu S, *Patel DJ and *Keeney S \(2025\) Cryo-EM structures of the Spo11 core complex bound to DNA. Nature Struct Mol Biol 32, 113-124. Epub Nov 2024. *Corresponding authors. PMC11746154](#)

[Zheng Z, Zheng L, Arter M, Liu K, Yamada S, Ontoso D, Kim S, and Keeney S \(2025\) Reconstitution of SPO11-dependent double-strand break formation. Nature 639, 784-791. PMC11922745](#)

[Kim S, Yamada S, Li T, Canasto-Chibuque C, Kim JH, Marcet-Ortega M, Eng DY, Feeney L, Petrini JHJ, and Keeney S \(2025\) Mouse MRE11-RAD50-NBS1 is needed to start and extend meiotic DNA end resection. Nature Commun 16, 3613. PMC12003770](#)

Arter M, Vedanayagam J, Lu M, Diop M, Liu K, Lai EC and Keeney S (2025) Structure-informed evolutionary analysis of the meiotic recombination machinery. bioRxiv doi: <https://doi.org/10.1101/2025.11.07.687317>

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People



Scott Keeney, PhD

Member, Molecular Biology Program, SKI; Investigator, Howard Hughes Medical Institute; Frederick R. Adler Chair

Professor

- Molecular biologist Scott Keeney investigates mechanisms of the initiation of meiotic recombination.
- PhD, University of California, Berkeley

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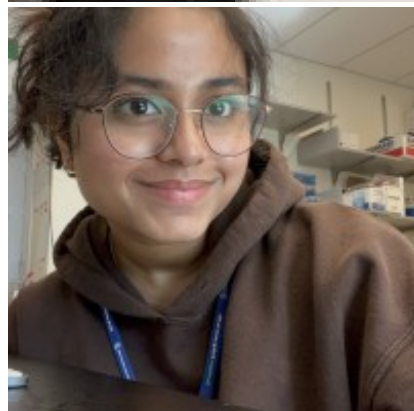
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Members



Naima Akter

Ahmad Alsomali
Senior Research Technician

Lab
Alumni

Lab Affiliations

Achievements

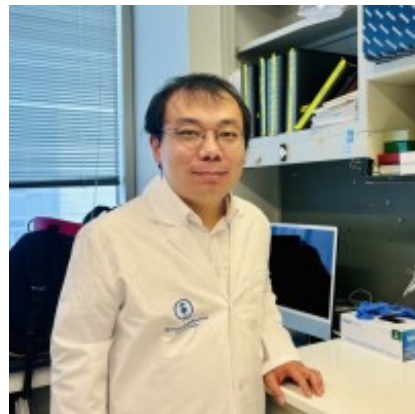
- Investigator, Howard Hughes Medical Institute (2008)

MSK Bridge Program Scholar

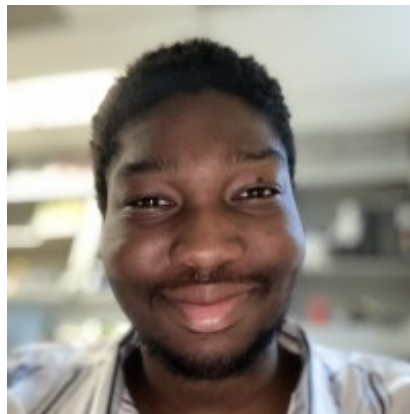


Roksana Azad
Research Scholar

- American Academy of Microbiology (2014)
- American Academy of Arts and Sciences (2017)
- Frederick Adler Chair, MSKCC (2017)
- US National Academy of Sciences (2020)



Jian Chen
Senior Research Scientist

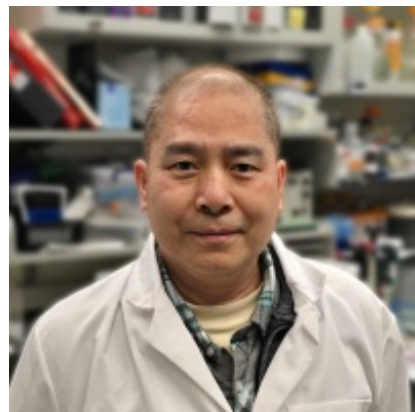


Momar Diop
Research Technician

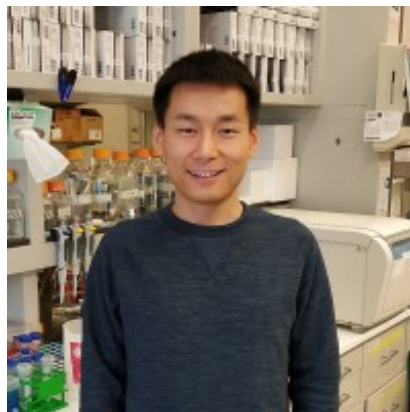
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Zhimin (Jimmy) Lao
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Tao Li
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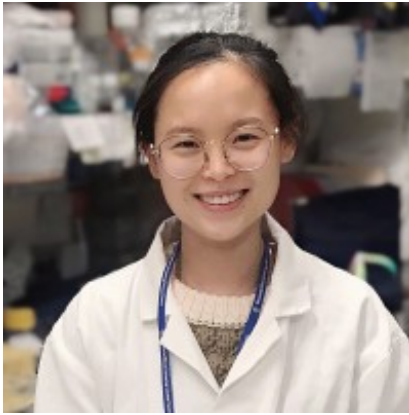
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Disclosures

Members of the MSK Community 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. These activities outside of MSK further our mission, provide productive collaborations, and promote the practical application of scientific discoveries.

MSK requires doctors, faculty members, and leaders to report (“disclose”) the relationships and



Min Lu
Senior Research Scientist



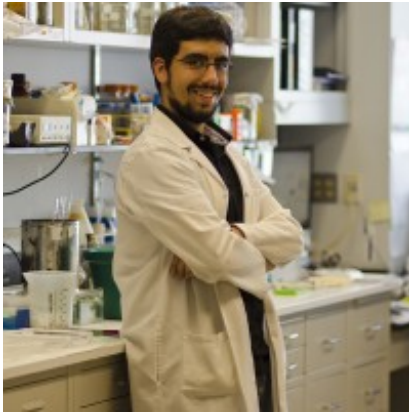
Marina Marcet
Senior Research Scientist



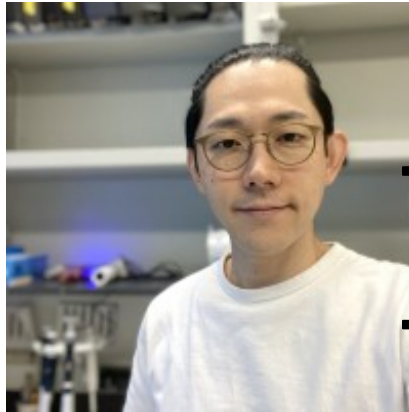
Anne McMahon
Research Scholar



Thierry N'Tumba-Byn
Research Specialist



David Ontoso
Research Specialist



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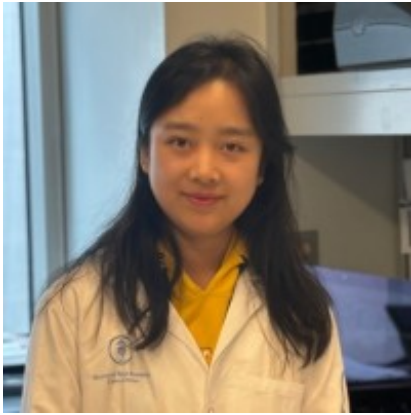
financial interests they have with external entities. As a commitment to transparency with our community, we make that information available to the public. Not all disclosed interests and relationships present conflicts of interest. MSK reviews all disclosed interests and relationships to assess whether a conflict of interest exists and whether formal COI management is needed.

Scott Keeney discloses the following relationships and financial interests:

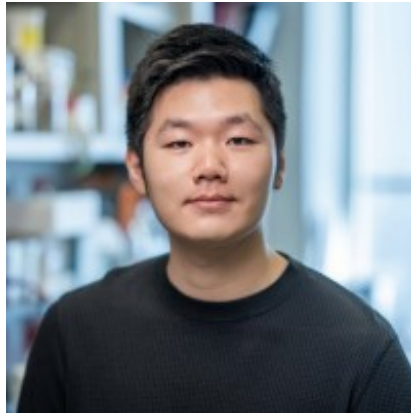
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Wenxin (Vincent) Xia
Graduate Student

Lyuqin Zheng
Research Associate

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