



Gerstner Sloan Kettering  
Graduate School of Biomedical Sciences

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MOLECULAR BIOLOGY PROGRAM

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## The Scott Keeney Lab

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Faculty

[Cancer Engineering](#)

## Research

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Scott Keeney, PhD

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

Professor

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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.

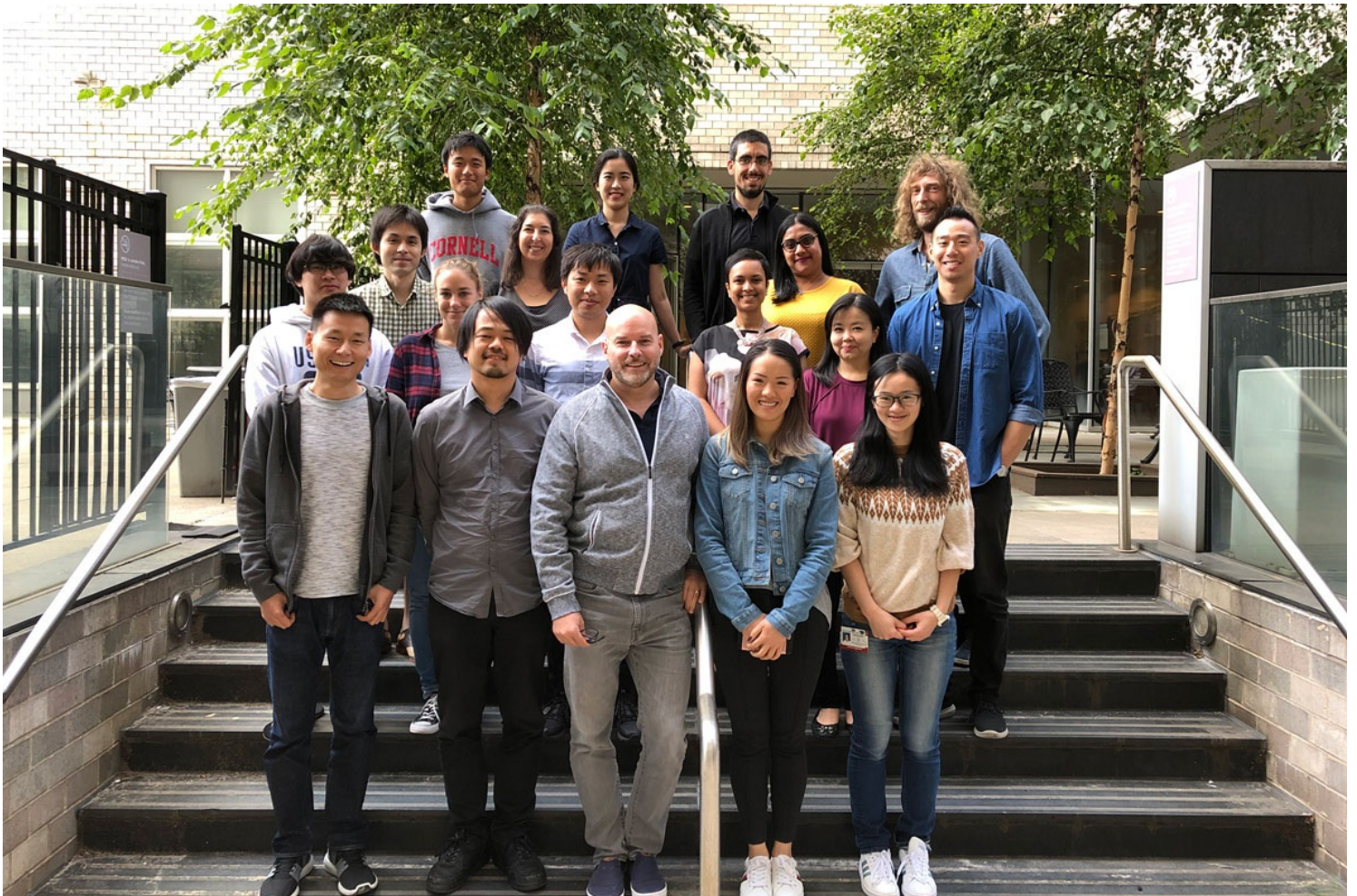
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## Research Projects

[Meiotic Recombination in the Yeast \*S. cerevisiae\*](#)

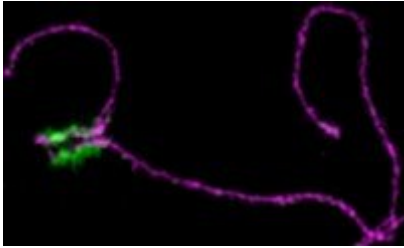
[Meiotic Recombination in the Mouse](#)

[Topoisomerase II in tumorigenesis and cytotoxic chemotherapy](#)



## Featured News

### IN THE LAB



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

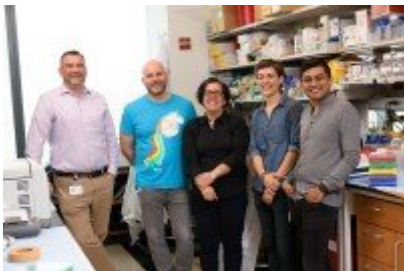
One's big, one's small. Somehow, they make it work.



### [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

[\\*Claeys Bouuaert C, Pu S, Wang J, Oger C, Daccache D, Xie W, Patel DJ, and \\*Keeney S \(2021\) DNA-driven condensation assembles the meiotic DNA break machinery. \*Nature\* 592, 144-149. \\*Corresponding authors. PMC8016751](#)

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[Lukaszewicz A, Lange J, \\*Keeney S, and \\*Jasin M \(2021\) \*De novo\* deletions and duplications at recombination hotspots in mouse germlines. \*Cell\* 184, 5970-5984 \\*Corresponding authors. PMC8616837.](#)

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[Liu K, Grasso EM, Pu S, Zou M, Liu S, Eliezer D, and Keeney S \(2023\) Structure and DNA bridging activity of the essential Rec114–Mei4 trimer interface. \*Genes Dev\* 37, 518-534. PMC10393192.](#)

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[†Yu Y, †Wang J, †Liu K, †Zheng Z, Arter M, Claeys Bouuaert, Pu S, \\*Patel DJ and \\*Keeney S \(2023\) Cryo-EM structure of the Spo11 core complex bound to DNA. bioRxiv, doi: <https://doi.org/10.1101/2023.10.31.564985> \\*Corresponding authors; †equal contribution.](#)

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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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## Members



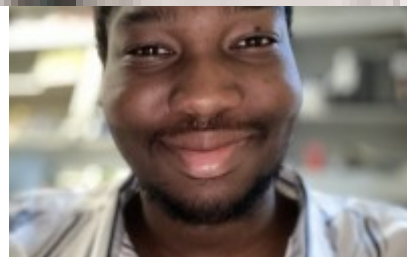
Meret Arter

Research Associate



Jian Chen

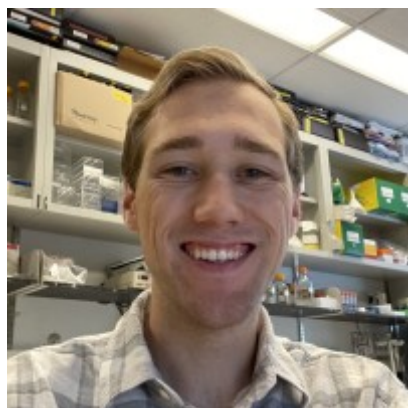
Senior Research Scientist



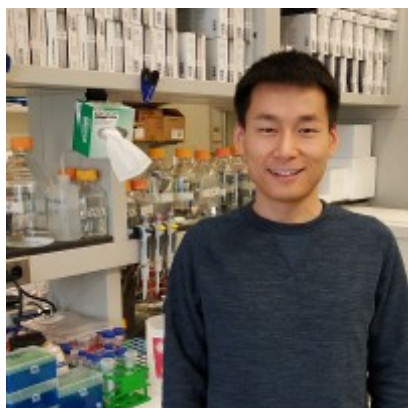
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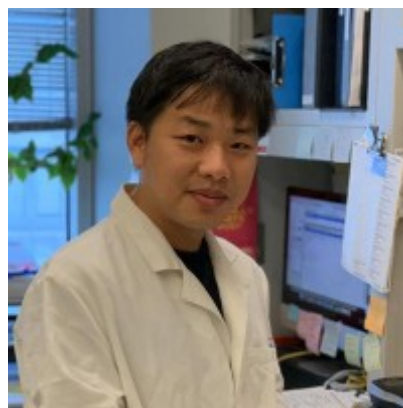
Research Technician



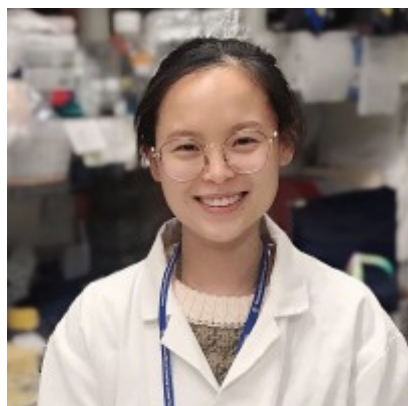
Riley Eastmond  
Research Technician



Tao Li  
Senior Research Scientist



Kaixian Liu  
Research Associate



Min Lu  
Research Associate



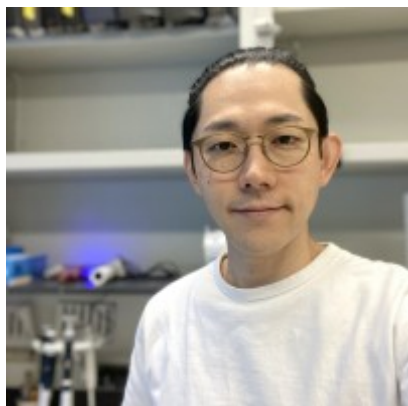
Marina  
Marcet  
Senior Research Scientist



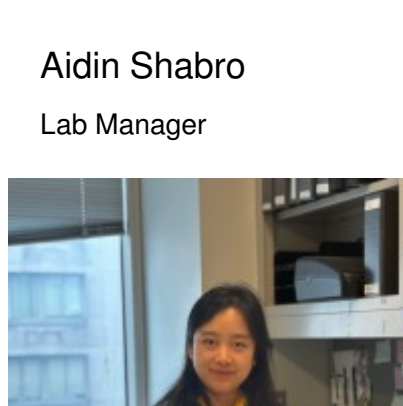
Thierry N'Tumba-  
Byn  
Research Specialist



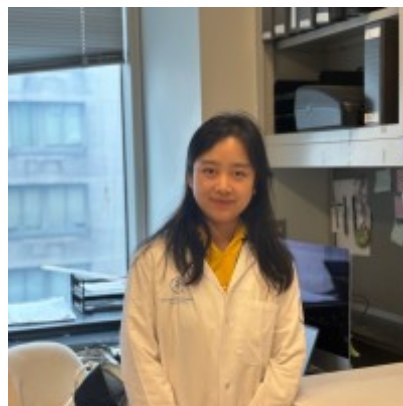
David  
Ontoso  
Research Specialist



Yuichiro Saito  
Research Specialist



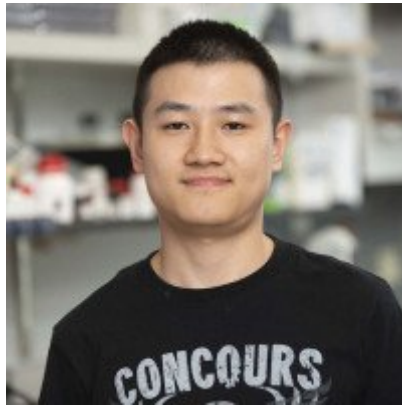
Aidin Shabro  
Lab Manager



Yan Wang  
Research Scholar

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Lyuqin  
Zheng  
Research Scholar



Zhi (Zack)  
Zheng  
Graduate Student

Lab Alumni  
+

Lab Affiliations  
+

## Achievements

Investigator, Howard Hughes Medical Institute (2008)  
American Academy of Microbiology (2014)  
American Academy of Arts and Sciences (2017)  
Frederick Adler Chair, MSKCC (2017)  
US National Academy of Sciences (2020)

## 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.

Scott Keeney discloses the following relationships and financial interests:

AbbVie

Equity

Abbott Laboratories

Equity

Fred Hutchinson Cancer Research Center

Professional Services and Activities

Max Planck Institute of Biochemistry

Professional Services and Activities (Uncompensated)

Pfizer, Inc.

Equity

Viatis Inc.

Equity

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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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