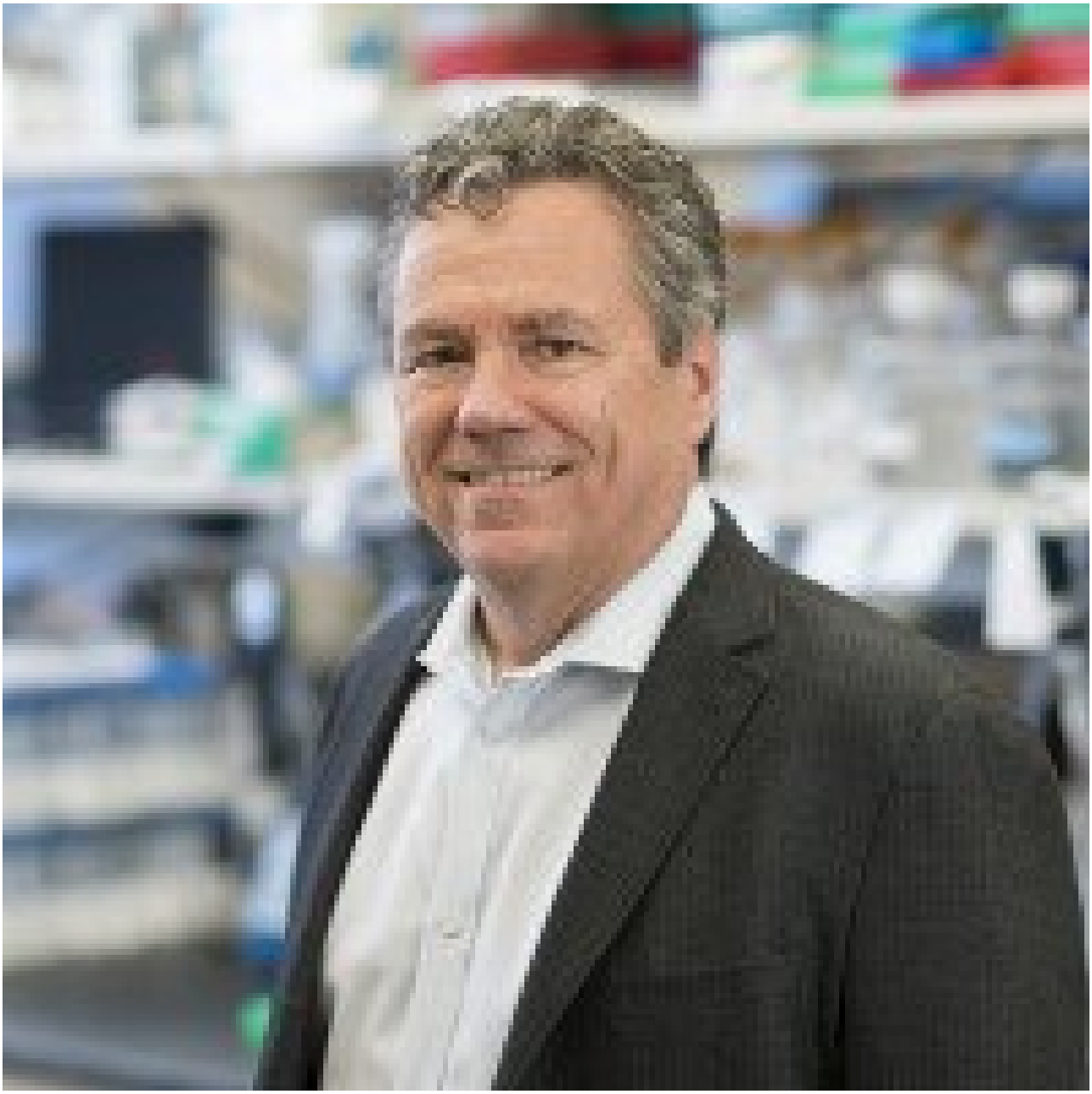
CANCER BIOLOGY & GENETICS PROGRAM

The Scott Lowe Lab



Scott W. Lowe, PhD
Chair, Cancer Biology & Genetics Program, SKI; Chair, Geoffrey Beene Cancer Research Center; Investigator, Howard Hughes Medical Institute

About the Scott Lowe Lab

Cancer biologist Scott Lowe uses genetically engineered mouse models to study how the genetic alterations in cancer cells contribute to tumorigenesis, alter treatment response, and create molecular vulnerabilities that may be targeted therapeutically.

Cancer arises through an evolutionary process whereby normal cells acquire mutations that erode

growth controls. Still, cancer is not an inevitable consequence of mutation, but is kept in check by intrinsic tumor-suppressor programs activated in damaged cells. We study such programs to reveal, and ultimately exploit, the strategies nature uses to combat cancer.

Our early studies focused on *cell-intrinsic* programs that prevent tumorigenesis (e.g., apoptosis, senescence), and have broadened to *cell-extrinsic* mechanisms (e.g., immune surveillance). New areas of interest include how tumor-suppressive programs are blunted by environmental factors known to increase cancer incidence (e.g., obesity, aging) and how excessive activation of tumor-suppressive programs (e.g., senescence) can harm function of normal tissue. To gain a mechanistic understanding of these phenomena, we apply mouse models in which cancer arises in an intact tissue ecosystem, which is a long-standing strength of our program. Our affiliation with Memorial Sloan Kettering Cancer Center enables us to probe human systems as well.

Another major goal is to harness our knowledge of tumor suppression therapeutically. We and others have shown that reengaging tumor-suppressive programs in established cancer cells can coordinate tumor regression through both cell-intrinsic and cell-extrinsic components (1-5), so these programs represent attractive strategies for tumor control. With Michel Sadelain, we have also developed a cell therapy approach to remove excessive senescent cells from tissues (6); this therapy may have beneficial effects on cancer and non-cancer pathologies. Advancing these concepts are major goals of our current research.

Follow Lowe Lab on Twitter!

View Lab Overview (https://www.mskcc.org/research/ski/labs/scott-lowe/overview)

Research Projects

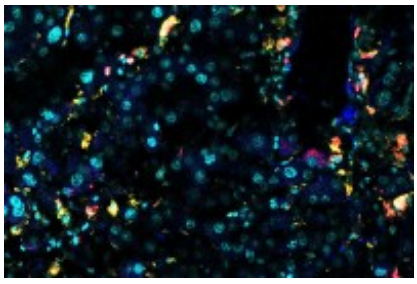
- Developing Technologies that Reveal New Biology
- The p53 Tumor Suppressor Network
- Understanding and Targeting Cellular Senescence
- Gene-Environment Interactions in Cancer Initiation and Progression

VIDEO | 02:17

Go inside the lab of Scott Lowe from SKI's Cancer Biology & Genetics Program.

Video Details (https://www.mskcc.org/videos/inside-my-lab-scott-lowe)

Featured News

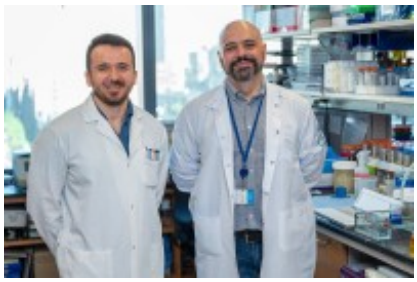


[CAR T Cells Show Promise Against Age-Related Diseases in Mice]

Laboratory research led by MSK and Cold Spring Harbor Laboratory demonstrates the potential for CAR T cells to improve “healthspan” by eliminating senescent cells associated with aging-related diseases.

Expansion of Cell-to-Cell Communication Drives the Early Development of Pancreatic Cancer, New Research in Mice Finds

New MSK research combined sophisticated genetically engineered mouse models and advanced computational methods to map the earliest cell states leading to pancreatic ductal adenocarcinoma (PDAC), the most common type of pancreatic cancer.



New MACHETE Technique Slices Into Cancer Genome To Study Copy Number Alterations

Learn why MSK researchers developed MACHETE, a new CRISPR-based technique to study large-scale genetic deletions efficiently in laboratory models.

View All Featured News

Publications Highlights

Metabolic adaptations direct cell fate during tissue regeneration

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Chaves-Perez A, Millman SE, Janaki-Raman S, Ho YJ, Hinterleitner C, Barthet VJA, Morris JP 4th, Barriga FM, Reyes J, Kyaw A, Pasolli HA, Pe'er D, Thompson CB, Finley LWS, Cross JR, Lowe SW. Metabolic adaptations direct cell fate during tissue regeneration. Nature. 2025 Jul;643(8071):468-477. doi: 10.1038/s41586-025-09097-6. Epub 2025 Jun 11. Erratum in: Nature. 2025 Jul;643(8072):E15. doi: 10.1038/s41586-025-09294-3. PMID:

40500453; PMCID: PMC12240837.

Epigenetic plasticity cooperates with cell-cell interactions to direct pancreatic tumorigenesis.

Burdziak C, Alonso-Curbelo D, Walle T, Reyes J, Barriga FM, Haviv D, Xie Y, Zhao Z, Zhao CJ, Chen HA, Chaudhary O, Masilionis I, Choo ZN, Gao V, Luan W, Wuest A, Ho YJ, Wei Y, Quail DF, Koche R, Mazutis L, Chaligné R, Nawy T, Lowe SW, Pe'er D.Science. 2023 May 12;380(6645):eadd5327. doi: 10.1126/science.add5327. Epub 2023 May 12.PMID: 37167403

Senescence Rewires Microenvironment Sensing to Facilitate Antitumor Immunity.

View All Publications

People

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- PhD, Massachusetts Institute of Technology

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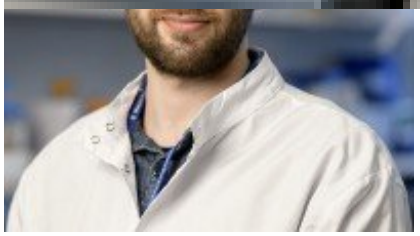
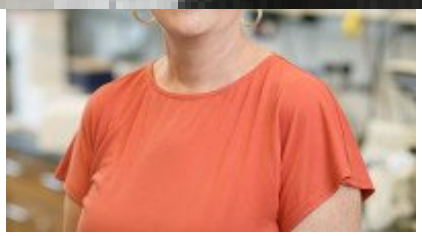
Alumni



Valentin Barthet
Postdoctoral Researcher



Lynn Boss
Administrative Coordinator

Lab Affiliations

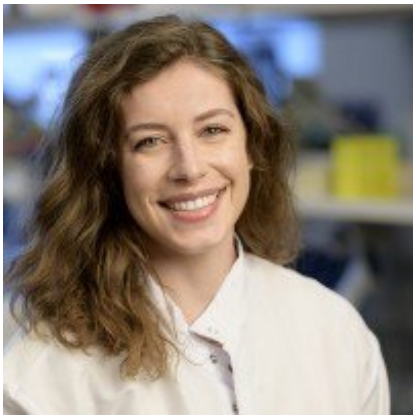
Open Positions

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

Caroline Broderick

Graduate Student

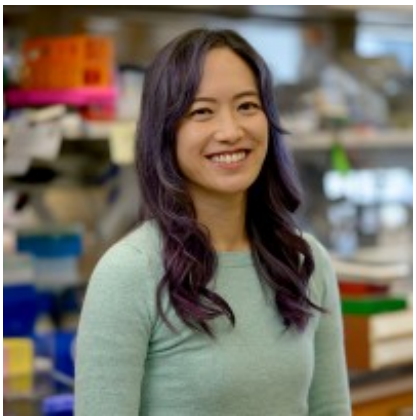


Andrea Chaikovsky

Postdoctoral Researcher

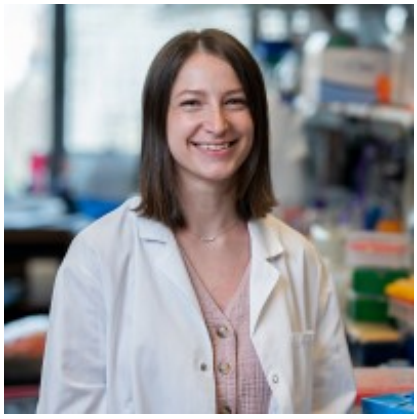
Almudena Chaves Perez

Postdoctoral Researcher



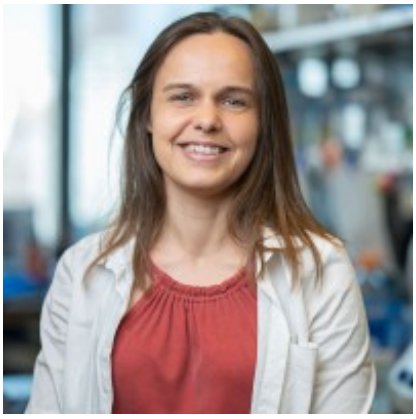
Joyce Chen

Medical Oncology Fellow



Isabella Del Priore

Graduate Student



Aveline Filliol

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Lab Resources

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.

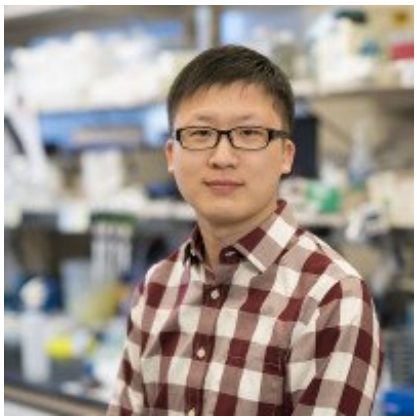
MSK requires doctors, faculty members, and leaders to report (“disclose”) the relationships and financial interests they have with external entities. As a commitment to transparency with our community, we make that information available to the public. Not all disclosed interests and relationships present 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.

Hailey V. Goldberg

Graduate Student

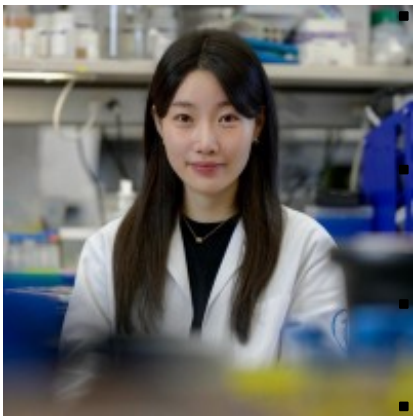
Clemens Hinterleitner

Postdoctoral Researcher



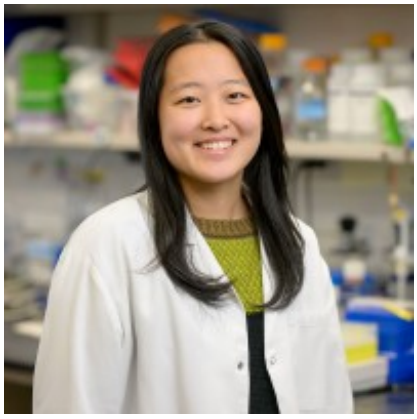
Yu-Jui (Ray) Ho

Computational Biologist



Minseo Kim

Weill Cornell Graduate Student



Marguerite Li

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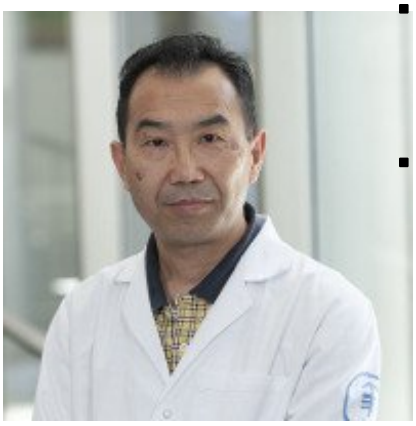


Wei Luan

Senior Research Technician

Scott W. Lowe discloses the following relationships and financial interests:

- Algen

  Intellectual Property Rights
- Blueprint Medicines

  Equity; Professional Services and Activities
- Faeth Therapeutics, Inc

  Equity; Professional Services and Activities (Uncompensated)
- Fate Therapeutics

  Intellectual Property Rights; Professional Services and Activities
- Mirimus

  Equity; Professional Services and Activities
- Oric Pharmaceuticals

  Equity; Professional Services and Activities
- PMV Pharma

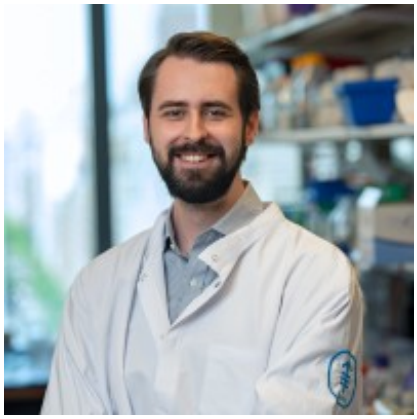
  Equity; Professional Services and Activities
- Selectin Therapeutics, Inc.

  Equity; Professional Services and Activities (Uncompensated)
- Senescea Therapeutics

  Equity; Intellectual Property Rights; Professional Services and Activities (Uncompensated)

The information published here is a complement to other publicly reported data and is for a specific annual disclosure period. There may be differences between information on this and other public sites as a result of different reporting periods and/or the various ways relationships and financial interests are categorized by organizations that publish such data.

This page and data include information for a specific MSK annual disclosure period (January 1, 2024 through disclosure submission in spring 2025). This data reflects interests that may or may not still exist. This data is updated annually.



Domhnall McHugh

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José Reyes

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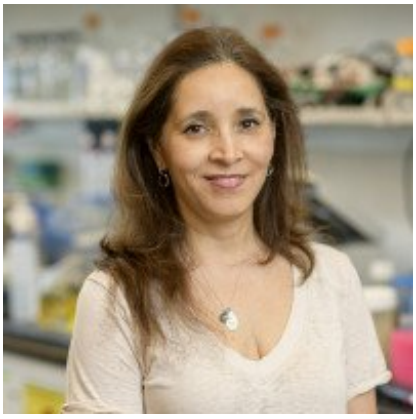

Janelle Simon

Mouse Colony Manager

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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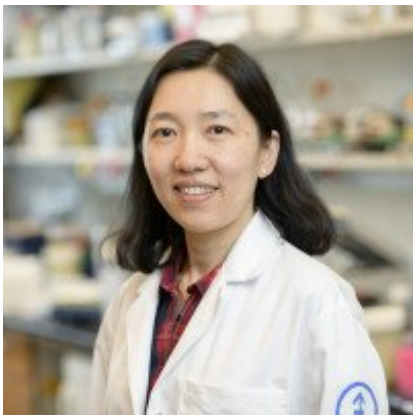

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