

# Amelie Raz

## Curriculum Vitae

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### Current Role

2020–present **Postdoctoral Research Fellow**, *Whitehead Institute for Biomedical Research*, Cambridge MA, Lab of Yukiko Yamashita

Research on the necessary molecular components maintaining and regenerating germline stem cell state. Work has produced a single-cell and single-nucleus sequencing atlas of the *Drosophila* testis that identified a novel translational regulatory program. Continuing work has determined how combinatorial signaling from germline niche cells balances germline self-renewal, differentiation, and dedifferentiation.

### Education

2013–2020 **PhD in Biology**, *Massachusetts Institute of Technology*, Cambridge MA

**Advisor:** Peter Reddien

**Thesis Title:** Choices in Regeneration: Position and Fate

Graduate school research focused on diverse questions around regeneration biology, including identifying (1) a conserved cellular and molecular process for body patterning during regeneration, and (2) a novel cell cycle correlated mechanism of stem cell specification without loss of potency in a regenerative organism.

2007–2011 **AB in Biology**, *Bryn Mawr College*, Bryn Mawr PA

Graduated with honors in the major; cum laude.

### Research Interests

I am a stem cell biologist who combines computational bioinformatics, genetics, and cell biology to study cell fate decisions. I seek to discover how germline stem cells (GSCs), which underlie the continuity of all sexually reproductive life, can uphold their unique cellular responsibilities while also allowing reestablishment of GSC fate during trans- and de-differentiation.

### Primary Research Publications

- [1] **Amelie A. Raz\***, Gabriela S Vida\*, Sarah R Stern\*, Sharvani Mahadevaraju\*, Jaclyn M Fingerhut\*, Jennifer M Viveiros\*, Soumitra Pal\*, Jasmine R Grey\*, Mara R Grace\*, Cameron W Berry, Hongjie Li, Jasper Janssens, Wouter Saelens, Zhantao Shao, Chun Hun, Yukiko M Yamashita, Teresa M Przytycka, Brian Oliver, Julie A Brill, Henry M Krause, Erika L Matunis, Helen White-Cooper, Stephen DiNardo, and Margaret T Fuller. Emergent dynamics of adult stem cell lineages from single nucleus and single cell RNA-Seq of *Drosophila* testes. *eLife*, 2023. doi: 10.7554/eLife.82201. \**co-first authors*.
- [2] **Amelie A. Raz**, Omri Wurtzel, and Peter W Reddien. Planarian stem cells specify fate yet retain potency during the cell cycle. *Cell Stem Cell*, 2021. doi: 10.1016/j.stem.2021.03.021.
- [3] **Amelie A. Raz**, Mansi Srivastava, Ranja Salvamoser, and Peter W. Reddien. Acoel regeneration mechanisms indicate an ancient role for muscle in regenerative patterning. *Nature Communications*, 2017. doi: 10.1038/s41467-017-01148-5.
- [4] Ryan D. Bickel, Hillary C. Cleveland, Joanna Barkas, Caitlin C. Jeschke, **Amelie A. Raz**, David L. Stern, and Gregory K. Davis. The pea aphid uses a version of the terminal system during oviparous, but not viviparous, development. *EvoDevo*, 2013. doi: 10.1186/2041-9139-4-10.

- [5] Scott D Halpern, **Amelie Raz**, Rachel Kohn, Michael Rey, David Asch, and Peter Reese. Regulated Payments for Living Kidney Donation: An Empirical Assessment of the Ethical Concerns. *Annals of Internal Medicine*, 2010. doi: 10.7326/0003-4819-152-6-201003160-00005.

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## Reviews and Perspectives

- [1] **Amelie A. Raz**<sup>#</sup> and Yukiko M. Yamashita<sup>#</sup>. Stem cell niche signaling goes both ways. *Developmental Cell*, 2021. doi: 10.1016/j.devcel.2021.08.003. <sup>#</sup> *co-corresponding authors*.
- [2] **Amelie A. Raz**<sup>#</sup> and Yukiko M. Yamashita<sup>#</sup>. Molding immortality from a plastic germline. *Current Opinion in Cell Biology*, 2021. doi: 10.1016/j.cecb.2021.04.010. <sup>#</sup> *co-corresponding authors*.

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## Funding Awards

- NIH F32, Postdoctoral Fellowship, 2021-2024
- American Cancer Society, Postdoctoral Fellowship (declined)
- Travel Award Research Prize to the 2017 meeting of the British Society for Developmental Biology

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## Teaching

### Course for which I was the instructor

Fall 2023 **MIT**, 7.344, Mortal Beings, Immortal Cells: Cellular Immortality in Normal Biology and Human Disease

### Courses for which I was a teaching assistant

Fall 2016 **MIT**, 7.06, Cell Biology

Fall 2014 **MIT**, 7.012, Introductory Biology

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## Past Research Experience

2011–2013 **Research Specialist**, *University of Pennsylvania*, Philadelphia, PA

Performed research with Dr. Lewis Chodosh in the Department of Cancer Biology on the genetics and physiology of breast cancer occurrence and metastasis in a mouse model. Major projects include the assay of a novel cancer drug through markers of tumor cell proliferation, apoptosis, and survival; assay of chemotherapeutics on recurrent cancer; assay of autophagy inhibition in dormant tumor cells; and establishment, optimization, and maintenance of transgenic mouse lines.

2010–2011 **Research Intern**, *Bryn Mawr College*, Bryn Mawr, PA

Performed research with Dr. Gregory Davis in the Department of Biology on the role of methylation in gene expression in the pea aphid, sponsored by the Summer Science Research Fellowship.

2009 **Research Intern**, *University of Pennsylvania*, Philadelphia, PA

Performed research with Dr. Katherine Nathanson regarding the environmental toxins associated with increased risk of breast or testicular cancer, sponsored by the Clinical and Translational Research Award Internship.

2008 **Research Intern**, *University of Pennsylvania*, Philadelphia, PA

Performed research with Dr. Scott Halpern at the Center for Bioethics on the ethics of a regulated market for living organ donations. Responsible for experimental design, data collection and analysis, and preparation of the final manuscript.

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## Invited and Selected Talks

- Whitehead Institute Annual Retreat - September 2023
- International Flatworm Friday - March 2022
- Gettysburg College - September 2021
- NIH National Cancer Institute - June 2021
- American Society for Cell Biology - December 2017
- North American Planaria Meeting - October 2017
- Northeast Society for Developmental Biology - April 2017
- Society for Medical Decision Making - October 2008
  - Received first-place prize for best undergraduate, medical, or graduate student talk

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## Poster Presentations

- International Drosophila Meeting - March 2023
- Cold Spring Harbor Meeting: Germ Cells - October 2022
- Gordon Conference: Cell Polarity - May 2022
- International Planaria Meeting - July 2018
- British Society for Developmental Biology - April 2018
- Society for Developmental Biology - July 2017
  - Received first-place prize for best graduate student poster
- Howard Hughes Medical Institute Science Meeting - February 2017
- Society for Developmental Biology - May 2016
- North American Planaria Meeting - September 2016

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## Professional Service

- 2022-Present **Organizer, MIT Biology Mentorship Program, MIT**  
Created and organized a mentorship program for post-doctoral researchers and graduate students.
- 2021-2022 **Organizer, Whitehead Forum, Whitehead Institute**  
Led a weekly seminar of current and former members of the Whitehead Institute, as well as outside speakers. Due to the ongoing Covid-19 situation in 2021-22, this included a combination of entirely virtual seminars, hybrid seminars, and in-person seminars. Speakers came from within MIT, Harvard, Duke, and Columbia.
- 2019-Present **Journal Reviewer**  
Reviewed papers for multiple journals related to regeneration, germline biology, and/or single-cell sequencing.

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## Equity and Outreach

- 2015-Present **MassBioEd/ExplorationBio Facilitator, Whitehead Institute**  
Led quarterly workshops with local high school students, teaching regenerative biology and basic lab techniques.
- 2021 **Girls' Day Presenter, MIT Museum**  
Ran a workshop and presentation on regeneration for local middle-grade girls.
- 2014-2018 **Teacher Partnership Program, Whitehead Institute**  
Met monthly with a high school biology teacher partner to attend a lecture by a local scientist and discuss current science that may be applicable to high school. Led two sessions in the partner's class.
- 2015-2018 **Assisting Scientist, Milton Academy**  
Coordinated high school biology experiments with a biology teacher at Milton Academy, including writing high school-level protocols, mentoring two high school students for a science fair project using planaria, leading lectures in the high school class, and hosting groups of students for a tour of the Whitehead.

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## Professional Development

2016 **Kauffman Teaching Certificate Program, MIT**

Completed certification demonstrating commitment to teaching, including crafting a Teaching Philosophy Statement, designing a syllabus, completing mock-lectures, and discussing recent pedagogical research.

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## Lab Mentorship

2020-Present **Senior Lab Mentor, Yamashita Lab**

Directly mentored two PhD rotation students and a technician. Ran several intra-lab workshops, e.g. a bioinformatics workshop on writing R scripts for single-cell sequencing analysis and job submission to the Whitehead Unix cluster.

2015-2020 **Lab Mentor, Reddien Lab**

Mentored four PhD rotation students.

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## Memberships

Society for Developmental Biology

Genetics Society of America

American Society for Cell Biology