

Shira Weingarten-Gabbay

Email: shirawg@broadinstitute.org
Website: <https://www.shiraweingartengabbay.com/>

EDUCATION AND RESEARCH EXPERIENCE

- 2022 - ..** **Visiting Postdoctoral Fellow.** The Rockefeller University
Advisor: Prof. Charles Rice, Laboratory of Virology and Infectious Disease
- 2017 - ..** **Postdoctoral Fellow.** The Broad Institute of MIT and Harvard
Advisor: Prof. Pardis Sabeti, Infectious Disease & Microbiome Program
Research topic: Viral non-canonical ORFs as a hidden source for T cell epitopes
- 2011 – 2017** **PhD in Life Sciences (Systems Biology).** Weizmann Institute of Science
Advisor: Prof. Eran Segal, Department of Computer Science & Applied Mathematics and Department of Molecular Cell Biology
Thesis: Unraveling the regulatory code of transcription and translation in the human genome and viruses
- 2008 – 2011** **MSc in Life Sciences (Molecular Genetics).** Weizmann Institute of Science
Advisor: Prof. Adi Kimchi, Department of Molecular Genetics
Thesis: The translation initiation factor DAP5 promotes IRES-driven translation of p53 mRNA
- 2005 - 2008** **BSc in Medical Sciences (*magna cum laude*).** Hadassah Medical School, Hebrew University

AWARDS AND HONORS

- The RNA Society Eclipse award for innovation in high throughput Biology. 2023
- Leading Edge Fellow. 2022
- BroadIgnite award. The Broad Institute. 2021
- 40-under-40 list of Israel's most promising young people. Globes Magazine. 2020
- Human Frontier Science Program (HFSP) Long-Term fellowship. 2019
- Life Science Research Foundation (LSRF) fellowship. (declined)
- The Zuckerman STEM Leadership Program for Israeli Postdoctoral Fellowship. 2019
- SPARC catalytic funding. The Broad Institute. Co-investigator. 2018
- EMBO Long-Term fellowship. 2018 (non-stipendiary fellow).
- Gruss-Lipper postdoctoral fellowship. 2018
- Rothschild postdoctoral fellowship. 2017.
- Israel national postdoctoral award for advancing women in science. 2017
- The Israeli council for higher education (VATAT) fellowship for excellent women postdocs. (declined)
- The Lady Anne Chain memorial prize for academic excellence. Finberg Graduate School. 2017
- Travel grant award - EMBO workshop on Antigen Processing and Presentation. 2017
- Travel scholarship for the McGill-Weizmann Cancer Symposium in Montreal. 2016
- Clore PhD fellowship. 2013
- Student project grant award of the Azrieli Center for Systems Biology. 2012, renewed in 2014
- Student research grant award of the Kahn Center for Systems Biology. 2011
- Rector of the university scholarship for outstanding students. Hebrew University of Jerusalem. 2008
- Dean of the faculty scholarship for outstanding students. Faculty of Medicine, Hebrew University. 2007
- Dean of the faculty excellence list. Faculty of Medicine, Hebrew University of Jerusalem. 2006, 2007, 2008
- Amos De Shalit Ulpana for outstanding students in life sciences. Weizmann Institute of Science. 2007

FIRST/CO-FIRST AUTHOR PUBLICATIONS

NCBI My Bibliography: <https://www.ncbi.nlm.nih.gov/myncbi/1DyhuytwgNF5r/bibliography/public/>

* co-first author;

^ corresponding authors;

lead contact

1. **Weingarten-Gabbay S[^]**, Bauer MR, Stanton AC, Klaeger S, Verzani EK, López D, Clauser KR, Carr SA, Abelin JG, Rice CM, Sabeti PC[^]. Pan-viral ORFs discovery using Massively Parallel Ribosome Profiling. **bioRxiv**. 2023
2. **Weingarten-Gabbay S^{*^#}**, Chen D-Y*, Sarkizova S*, Taylor HB, Gentili M, Pearlman LR, Bauer MR, Rice CM, Clauser KR, Hachoen N, Carr SA, Abelin JG, Saeed M, Sabeti PC. The HLA-II immunopeptidome of SARS-CoV-2. **bioRxiv**. 2023
3. **Weingarten-Gabbay S^{*^#}**, Pearlman LR*, Chen D-Y, Klaeger S, Taylor HB, Welch NL, Keskin DB, Carr SA, Abelin JG, Saeed M, Sabeti PC. HLA-I immunopeptidome profiling of human cells infected with high-containment enveloped viruses. **STAR protocols**. 2022
4. **Weingarten-Gabbay S^{*^#}**, Klaeger S[^], Sarkizova S*, Pearlman LR, Chen D-Y, ..., Hachoen N, Carr SA, Abelin JG, Saeed M[^], Sabeti PC. Profiling SARS-CoV-2 HLA-I peptidome reveals T cell epitopes from out-of-frame ORFs. **Cell**. 2021 > [Cell cover](#), [HFSP highlight](#), [Broad Institute news](#), [Boston University news](#)
5. **Weingarten-Gabbay S^{*^}**, Nir R*, Lubliner S, Sharon E, Kalma Y, Weinberger A and Segal E[^]. Systematic interrogation of human promoters. **Genome Research**. 2019
6. Gritsenko AA*, **Weingarten-Gabbay S***, Elias-Kirma S, Nir R, de Ridder D and Segal E. Sequence features of viral and human internal ribosome entry sites predictive of their activity. **PLoS Comp Biol**. 2017
7. **Weingarten-Gabbay S**, Elias-Kirma S, Nir R, Gritsenko AA, Yakhini Z, Stern-Ginossar N, Weinberger A and Segal E. Systematic discovery of cap-independent translation sequences in human and viral genomes. **Science**. 2016 > [Perspective in Science](#), [Highlight in Cell Systems](#), [Faculty of 1000 review](#), [Weizmann Institute news](#)
8. **Weingarten-Gabbay S** and Segal E. Toward a systematic understanding of translational regulatory elements in human and viruses. **RNA Biology**. 2016.
9. **Weingarten-Gabbay S** and Segal E. The grammar of transcriptional regulation. **Human Genetics**. 2014
10. **Weingarten-Gabbay S** and Segal E. A shared architecture for promoters and enhancers. **Nature Genetics**. 2014 (News and Views on Core *et al.*)
11. **Weingarten-Gabbay S***, Khan D*, Liberman N, Yoffe Y, Bialik S, Das S, Oren M and Kimchi A. The translation initiation factor DAP5 promotes IRES-driven translation of *p53* mRNA. **Oncogene**. 2013

CONTRIBUTING AUTHOR PUBLICATIONS

12. Hernández G, García A, **Weingarten-Gabbay S**, Hussain T, Mishra RK, Amiri M, Lasko P, Moreno-Hagelsieb G, Ivanov IP, Dever T, Sonenberg N. Functional analysis of the AUG initiator codon context reveals a conserved motif that disfavors mRNA translation in eukaryotes. **NAR** (accepted for publication).
13. David M, Olender T, Mizrahi O, **Weingarten-Gabbay S**, Friedlander G, Savidor A, Levin Y, Salomon V, Stern-Ginossar N, Bialik S and Kimchi A. DAP5 drives translation of specific mRNA targets with upstream ORFs in human embryonic stem cells. **RNA**. 2022.
14. Chen CK, Cheng R, Demeter J, Chen J, **Weingarten-Gabbay S**, Jiang L, Snyder MP, Weissman JS, Segal E, Jackson PK and Chang HY. Structured elements drive extensive circular RNA translation. **Molecular Cell**. 2021.
15. Taylor HB, Klaeger S, Clauser KR, Sarkizova S, **Weingarten-Gabbay S**, Graham DB, Carr SA, Abelin JG. Mass spectrometry-based HLA-II peptidomics combined with multi-omics will aid the development of future immunotherapies. **Mol Cell Proteomics**. 2021

16. Finkel Y*, Mizrahi O*, Nachshon A, **Weingarten-Gabbay S**, Yahalom-Ronen Y, Tamir H, Achdout H, Melamed S, Weiss S, Israely T, Paran N, Schwartz M and Stern-Ginossar N. The coding capacity of SARS-CoV-2. **Nature**. 2020
17. Vainberg Slutskin I, **Weingarten-Gabbay S**, Nir R, Weinberger A and Segal E. Unraveling the determinants of microRNA mediated regulation using a massively parallel reporter assay. **Nature Communications**. 2018
18. Keren L*, van Dijk D*, **Weingarten-Gabbay S**, Davidi D, Jona G, Weinberger A, Milo R and Segal E. Noise in gene expression is coupled to growth rate. **Genome Research**. 2015

PATENTS

- U.S. Non-Provisional Patent Application No. 17/463,429. "Profiling SARS-CoV-2 HLA-I peptidome reveals T cell epitopes from out-of-frame ORFs"
- U.S. Provisional Application No. 63/507,324. "The HLA-II immunopeptidome of SARS-CoV-2"
- U.S. Provisional Application No. 63/540,279. "Pan-viral ORFs discovery using Massively Parallel Ribosome Profiling"

INVITED SEMINARS AND ORAL PRESENTATIONS

- 1st NYC RNA Symposium. New York, NY. 2023 (Selected talk)
- RNA Society Meeting. Singapore. 2023 (Awardee talk)
- Gordon Research Conference on Viruses and Cells. Castelldefels, Spain. 2023 (Selected talk)
- University of Cambridge Virology Seminar. Cambridge, UK. 2023 (Invited seminar, Virtual)
- Translational Control Meeting. Cold Spring Harbor Laboratory, NY. 2022 (Selected talk)
- Leading Edge Symposium. 2022 (Virtual)
- The Rockefeller University Chris Browne seminar series. NY. 2022
- Fred Hutch computational biology seminar. Seattle, WA. 2022 (Invited seminar, Virtual)
- The annual Broad retreat. Cambridge, MA. 2021 (Selected talk)
- NIAID GCID annual meeting. 2021(Virtual)
- Institut de Génétique Moléculaire de Montpellier (IGMM) seminar. France. 2021 (Invited seminar, Virtual)
- Massachusetts Consortium on Pathogen Readiness (MassCPR). 2021(Virtual)
- Biology Postdocs & Associate-Scientists seminar. Columbia University, NY. 2021 (Invited seminar, Virtual)
- World Health Organization (WHO) working group on COVID-19 assays. 2020 (Invited seminar, Virtual)
- ScienceAbroad life sciences symposium. 2020 (Selected talk, Virtual)
- Genomic Center for Infectious Diseases (GCID). The Broad Institute, Cambridge, MA. 2020
- Bioclub computational biology seminar. The Hebrew University of Jerusalem, Israel. 2015 (Invited seminar)
- Computational RNA Biology meeting. Hinxton, UK. 2014 (Invited speaker)
- Genomics and Epigenomics club. Weizmann Institute of Science, Israel. 2014
- FEBS Workshop: Translating epigenomes into function. Capri, Italy. 2013 (Invited speaker)
- ENCODE Consortium meeting. Palo Alto, CA. 2013 (Lightning talk)

PROFESSIONAL SERVICE

- Co-founder of an international [Systems Virology Journal Club](#) with >800 registrants. 2020-
- Topic editor for special research issue on "Systems Viral Immunology" in *Frontiers in Virology*.
- Peer review for scientific journals: *Science*, *Nature*, *Cell*, *Nature Genetics*, *Nature Communications*, *Nature Plants*, *Genome Research*, *iScience*, and *Molecular Cell*.

TEACHING EXPERIENCE

- Teaching "Bioinformatics: Databases, Tools and Current Research". The Rothschild-Weizmann program for the advancement of science teachers (MSc Track), Feinberg Graduate School. 2013-2016

MENTORING

- Mentored two Harvard PhD students in the Sabeti lab (2019-2022, and 2022-) leading to two co-authored publications, three co-authored manuscripts in preparation, and a conference presentation by a mentee.
- Mentored and supervised a research technician in the Sabeti lab (2019-2021) leading to three co-authored publications, highlight of their work in “Faces of Cell”, and acceptance to an MSc program in Columbia University, NY.
- Mentored a Weizmann MSc student in the Segal lab (2013-2014) leading to two co-authored publications, a trainee grant award, and acceptance to a PhD program in the Technion, Israel.

SCIENCE COMMUNICATION AND OUTREACH

- The United Nations (UN) initiative to counter misinformation around COVID-19 vaccines. [YouTube](#). 2020
- Participating in an experts panel on COVID-19 vaccines in Israel. [Facebook](#). 2020
- Engaging female high school students with STEM. Academic Community for Israeli Society (Bashaar). 2017
- Tutor in the “Sparks of Science” program for the scientific and technological advancement of high school students from Ethiopia. Davidson Institute. 2011-2015.
- ‘Science on Tap’ lecturer. Popular science lectures in bars and cafés. Israel. 2012-2014.

GRANTS AND FUNDING

- Awarded two grants as an investigator/co-investigator to support my research at the Broad Institute: SPARC catalytic funding of \$100,000 (2018) and BroadIgnite award of \$40,000 (2021).
- Awarded postdoctoral fellowships for cumulative four years of training from the Human Frontier Science Program fellowship (LT-000396/2018), EMBO long-term fellowship (ALTF 883-2017, declined stipend), the Life Science Research Foundation (declined), the Gruss-Lipper postdoctoral fellowship, the Zuckerman STEM Leadership Program fellowship, and the Rothschild Postdoctoral Fellowship.
- Awarded Clore PhD fellowship for three years (2013-2016).
- Assisted in writing proposal and progress reports for grants to support my postdoctoral research in the Sabeti lab from the National Institute of Allergy and Infectious Diseases (U19AI110818) and the United States Department of Agriculture (58-3022-2-031).
- Assisted in writing proposal and progress reports for grants to support my PhD research in the Segal lab from the European Research Council (ERC 786344), the MRG-Grammar FET project (EU project 664918), the Israel Cancer Research Fund, and Abbott Laboratories.