

SHEERA ADAR, PhD

Jacob and Lena Joels Memorial Foundation Senior Lecturer
 Department of Microbiology and Molecular Genetics, Institute for Medical Research Israel-Canada
 Faculty of Medicine, The Hebrew University of Jerusalem, Ein Kerem, Jerusalem, Israel
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Experience

Senior Lecturer, The Hebrew University of Jerusalem

2016-present

- Principle investigator. My group studies formation and repair of carcinogenic DNA damages and damages induced by cancer therapies. We focus on skin, lung and ovarian cancer models with the aim to identify novel risk factors and new therapeutic approaches.

Postdoctoral Research Associate, University of North Carolina, Chapel Hill, NC.

2009-2016

Advisors: Prof. Jason Lieb and Prof. Aziz Sancar

- Studying the effect of transcription and chromatin state on DNA repair efficiency:
Created the first high-resolution genome-wide maps of DNA damages and DNA repair in human cells, focusing on damages formed by UV light and the chemotherapeutic drug cisplatin.
- Annotation of human regulatory DNA elements:
Developed a high throughput functional assay for enhancers, involving single site integration of a fluorescent reporter into human cells, followed by flow cytometry sorting (FACS) and high-throughput sequencing.

North Carolina regional manager for BioAbroad, Research Triangle, NC

2012-2016

- Organizing professional events (meeting professors and key personnel from the Israeli Academia/Industry) and social events (holiday celebrations, networking, etc.) to create better networking for Israeli scientists in North Carolina.
- Coordinating with BioAbroad management, organizing career development and informational webinars.
- Initiated BioAbroad's empowerment and enrichment program for women Israeli scientists currently in the US.
- Working in coordination with additional organizations both in the U.S and in Israel.

Postdoctoral Research Fellow, The Weizmann Institute of Sciences, Rehovot, Israel.

2008-2009

Advisor: Prof. Zvi Livneh

- Studied the tolerance of DNA damage during replication in mammalian cells.
- Used a plasmid-based functional assay to show homologous recombination acts as a tolerance mechanisms and repairs single stranded gaps containing damage.

Education

PhD, Feinberg Graduate School of the Weizmann Institute of Science, Rehovot, Israel.

2003-2008

Advisor: Prof. Zvi Livneh, Department of Biological Chemistry.

Thesis Title: "DNA Damage Tolerance in Mammalian Cells".

MSc, Feinberg Graduate School of the Weizmann Institute of Science, Rehovot, Israel

2000-2002

Supervisor: Prof. Zvi Livneh, Department of Biological Chemistry.

Thesis Title: "Analysis of DNA Damage Tolerance Mechanisms in Mammalian Cells".

BSc, Faculty of Life Sciences, Tel Aviv University, Israel, *cum laude*

1997-2000

Awards

Excellence in teaching award, 2021
Excellence in teaching award, 2019
Jacob and Lena Joels Memorial Foundation Senior Lectureship for Excellence in the Life and Medical Sciences, 2018
Golda Meir Fellowship prize, 2017
Dean's award Tel Aviv University, 2000
Dean's award Tel Aviv University, 1999
Dean's award, memorial scholarship, Tel Aviv University, 1998

Selected Presentations

1. The American Society for Photobiology monthly webinar series, December 2022, **invited webinar**.
2. Protein-DNA interactions: From Biophysics to Cell **Biology**. The Weizmann Institute of Science, Rehovot, Israel. October 2022. **Session chair**.
3. The American Society for Photobiology and Photochemistry biannual meeting, Albuquerque NM, USA, September 2022, **invited talk**.
4. The Hebrew University Faculty of Medicine, Institute for Medical Research Israel-Canada retreat, Nazareth, Israel, September 2022, **invited talk**.
5. Ben-Gurion University, The Shraga Segal Department of Microbiology, Immunology and Genetics, Beer Sheva, May 2022, **invited seminar**.
6. The Jerusalem college of technology, Academy and Industry seminar series, Virtual, May 2022, **invited seminar**.
7. Response to DNA damage conference, Egmond aan Zee, the Netherlands, March 2022, **talk**.
8. International School of Medicine Zhejiang University and the Faculty of Medicine Hebrew University joint virtual symposium, January 2022, **invited talk**.
9. Ben-Gurion University of the Negev, Department of Physiology and Cell Biology, **invited seminar**, November 2021.
10. Washington State University, School of Molecular Biosciences, **invited faculty lecture** October 2021.
11. The Minerva DNA repair and aging workshop, October 2021, virtual, **invited talk**.
12. The Jerusalem college of technology, Academy and Industry seminar series, Virtual, March 2021, **invited seminar**.
13. The EMBO/EMBL symposium "Friend or Foe: Transcription & RNA meet DNA replication and repair", Virtual, March 2021, **Poster and flash talk**.
14. The Hebrew University School of Pharmacy, Virtual, January 2021, **invited talk**.
15. Keystone Symposia on Genomic Stability and DNA Repair, Virtual, September 2020, **talk, session co-chair**.
16. Bar Ilan University, The Azrierli Faculty of Medicine, November 2019, Sfad, Israel, **invited seminar**.
17. The Max Planck Institute for Molecular Genetics, The Otto Warburg seminar series, **invited seminar**.
18. The I-CORE symposium on chromatin and RNA, June 2019, Zhichron Yaakov, Israel, **invited talk**.
19. The Hebrew University and Hadassah hospital joint cancer hub, Jerusalem, Israel, March 2019, **invited talk**.
20. The EACR-AACR-ISCR Conference: "The Cutting Edge of Contemporary Cancer Research", Jerusalem, Israel, October 2018, **session chair**.
21. The Birax ageing conference, London, UK, September 2018, **invited talk**.
22. The sixth annual Broad-ISF symposium, Broad institute, Cambridge, MA., USA, July 2018, **invited talk**
23. Institute for research in biomedicine (IRB) Barcelona, June 2018, **Invited seminar**.
24. EMBO workshop "Chromatin Dynamics and nuclear organization in genome maintenance", Illkirch, France, June 2018, **talk**.
25. 15th international workshop on radiation damage to DNA, Aussois, France, May 2018, **invited talk**.
26. The Technion Department of Biology, May 2018, **invited seminar**.
27. Israel/UK Symposium on Genome Stability and Dynamics, March 2018, Jerusalem, Israel, **invited talk**.
28. The Bi-national workshop on genetics, Israel Science foundation and Indian National Science Academy, February 2018, Delhi, India, **invited talk**

29. The Genetics Society of Israel annual meeting, February 2018, Tel Aviv, Israel, *invited talk*.
30. Bar Ilan University, Faculty of Life Sciences, December 2017, Ramat Gan, Israel, *invited seminar*.
31. Sheba Medical Center, November 2017, Tel Hashomer, Israel, *invited seminar*
32. The Max Delbrück Center for Molecular Medicine, October 2017, Berlin, Germany, *invited seminar*
33. EACR meeting “Protecting the code”, October 2017, Berlin, Germany, *Poster*
34. The FEBS congress, September 2017, Jerusalem, Israel, *talk*.
35. The European Society for Photobiology meeting, September 2017, Pisa, Italy, *invited talk*.
36. The Hebrew University of Jerusalem, Faculty of Life Sciences, Genetics Seminar, May 2017, Jerusalem, Israel, *invited seminar*.
37. The Hebrew University of Jerusalem, Hadassah Medical School, Cancer Hub meeting, April 2017, Ein Kerem, Jerusalem, *invited talk*.
38. The Golda Meir Fellowship Fund Annual Awards Assembly, March 2017, Jerusalem, Israel, *award talk*.
39. The Federation of Israel Societies for Experimental Biology Meeting, February 2017, Eilat, Israel, *invited talk*.
40. German Israel Foundation Young Scientists’ Meeting “The aging of the genome: new perspectives for an integrative biology”, February 2017, Ma’ale Hachamisha, Israel. *Invited talk and session chair*.
41. American Society of Photochemistry and Photobiology meeting, May 2016, Tampa, FL. *Invited talk*.
42. University of North Carolina Department of Biochemistry and Biophysics Departmental Retreat, April 2016, Charlotte, NC, *talk (Best talk award)*.
43. Hebrew University of Jerusalem, Faculty of Agriculture, January 2016, Rehovot, Israel, *invited seminar*.
44. The Weizmann Institute of Science, Department of Biological Chemistry, January 2016, Rehovot, Israel. *Invited seminar*.
45. Abcam conference on Epigenetics in Development, Aging and Disease, September, 14 2015, Chapel-Hill, NC, *Poster presentation*
46. NCI Symposium on Chromatin, ncRNA, Methylation and Disease, April 16-17, 2015, Bethesda MD, *Poster presentation*.
47. ENCODE Consortium Meeting, July 8-10, 2014, Palo Alto, CA, *Poster presentation*.
48. ENCODE Consortium Meeting, May 29-31, 2013, Palo Alto, CA, *Poster presentation and Talk*.

Publications

1. Mielko, Z. Zhang, Y., Liu, Y., Schaich, M.A., Schnable, B., Burdinski, D., **Adar, S.**, Pufall, M., Van Houten, B., Gordan, R., Afek, A. (2022) “UV irradiation remodels the specificity landscape of transcription factors”, *PNAS*, **120**(11): e2217422120
2. Blessing, C., Apelt, K., González-Prieto, R., van den Heuvel, D., Gonzalez Leal C., Rother, M.B., van der Woude, M., Yifrach, A., Parnas, A., Shah, R.G., Tyrsett, T.K., Boer, D., Cai, J., Kragten, A., Kim, H.-S., Schärer O.D., Vertegaal, A.C.O., Shah, G.M., **Adar, S.**, Lans, H., van Attikum, H., Ladurner, A.G., and Luijsterburg, M.S. (2022) “XPC-PARP complexes engage the chromatin remodeler ALC1 to catalyze global genome DNA damage repair”, *Nature comm*, **13**(1):4762.
3. Alfí, O., Hamdan, M., Wald, O., Yakirevitch, A., Wandel, O., Oiknine-Djian, E., Gvili, B., Knoller, H., Rozendorn, N., Golan Berman H., **Adar, S.**, Vorontsov, O., Mandelboim, M., Zakay-Rones, Z., Oberbaum, M., Panet, A., Wolf, D.G. (2022) “SARS-CoV-2 Omicron Induces Enhanced Mucosal Interferon Response Compared to other Variants of Concern, Associated with Restricted Replication in Human Lung Tissues”. *Viruses* **14**(7):1583
4. Nasereddin, A., Golan Berman, H., Wolf, D.G., Oiknine-Djian, E., **Adar S.** (2022) “Identification of SARS-CoV-2 variants of concern using amplicon next generation sequencing”, *Microbiology Spectrum*, *accepted*.
5. Wegner, F., T. Roloff, M. Huber, S. Cordey, A. Ramette, Y. Gerth, C. Bertelli, M. Stange, H. M. B. Seth-Smith, A. Mari, K. Leuzinger, L. Cerutti, K. Harshman, I. Xenarios, P. Le Mercier, P. Bittel, S. Neuenschwander, O. Opota, J. Fuchs, M. Panning, C. Michel, M. Hallin, T. Demuyser, R. De Mendonca, P. Savelkoul, J. Dingemans, B. van der Veer, S. A. Boers, E. C. J. Claas, J. P. M. Coolen, W. J. G. Melchers, M. Gunell, T. Kallonen, T. Vuorinen, A. J. Hakonen, E. Bernhoff, M. A. K. Hetland, H. Golan Berman, **S. Adar**, J. Moran-Gilad, D. G. Wolf, S. L. Leib, O. Nolte, L. Kaiser, S. Schmutz, V. Kufner, M. Zaheri, A. Trkola, H. V. Aamot, H. H. Hirsch, G. Greub, and A. Egli.

- (2022) "External Quality Assessment of SARS-CoV-2 Sequencing: an ESGMD-SSM Pilot Trial across 15 European Laboratories." *J Clin Microbiol* **60**(1):e0169821
6. Yaakov, A., Vardi, O., Blumenfeld, B., Greenberg, A., Massey, D.J., Koren, A., **Adar, S.**, Simon, I., and Rosenberg, S., (2021) "Cancer mutational processes vary in their association with replication timing and chromatin accessibility". *Cancer Res.* 81(24):6106-6116
 7. Douki T. and **Adar S.** (2021) "UV-induced formation of DNA damage in cells and their mutational consequences", chapter in the book "DNA photodamage", The Royal Society of Chemistry.
 8. Golan-Berman, H., Chauhan, P., Shalev, S., Hassanain, H., Parnas, A., and **Adar, S.** (2021) Genomic characterization of cisplatin response uncovers priming of cisplatin-induced genes in a resistant cell line. *IJMS* 22(11):5814
 9. Heilbrun, E.E., Meirav, M., **Adar, S.** (2021) "Exons and introns exhibit transcriptional strand asymmetry of dinucleotide distribution, damage formation and DNA repair", *NAR genom. Bioinform.* 3(1):lqab020.
 10. Heilbrun, E.E., Meirav, M., Parnas A., **Adar, S.** (2020) "The Hardwired transcriptional response to DNA damage", Current opinions in Systems Biology, invited review, *Current Opinion in Systems Biology* 19:1-7.
 11. van der Weegen Y, Golan-Berman H, Mevissen TET, Apelt K, González-Prieto R, Goedhart J, Heilbrun EE, Vertegaal ACO, van den Heuvel D, Walter JC, **Adar S**, Luijsterburg MS. (2020) "The cooperative action of CSB, CSA, and UVSSA target TFIIH to DNA damage-stalled RNA polymerase II." *Nat Commun.* 2020 Apr 30;11(1):2104.
 12. Milo-Cochavi S., **Adar S.**, and Covo S. (2019) "Developmentally-regulated oscillations in the expression of UV repair genes in a soilborne plant pathogen dictate UV repair efficiency and survival", *mBio.* **10**(6):e02623-19
 13. Hu, J. Selby CP. **Adar, S.** Adebali, O. and Sancar A. (2017) "Molecular mechanisms and genomic maps of DNA excision repair in E.coli and humans", *J. Biol. Chem.* **292**(38):15588 –15597
 14. Hu, J. Adebali, O. **Adar, S.** and Sancar A. (2017) "Dynamic maps of UV damage formation and repair for the human genome", *Proc. Natl. Acad. Sci. U. S. A.* **114**(26):6758-6763.
 15. Li, W. Hu, J. Adebali, O. **Adar, S.** Yang, Y. Chiou, Y. and Sancar, A. (2017) "Human genome-wide repair map of DNA damage caused by the cigarette smoke carcinogen benzo[a]pyrene", *Proc. Natl. Acad. Sci. U. S. A.* **114**(26):6752-6757.
 16. Hu, J. and **Adar, S.** (2017) "The cartography of UV-induced DNA damage formation and DNA repair", *Photochem Photobiol.* **93**(1):199-206, **Corresponding author, invited review.**
 17. Hu, J., Lieb, JD., Sancar, A., **Adar, S.** (2016), "Cisplatin DNA damage and repair maps of the human genome at single-nucleotide resolution", *Proc. Natl. Acad. Sci. U. S. A.* **113**(41):11507-11512. **Co-corresponding author.**
 18. **Adar, S.** *, Hu, J. *, Lieb, JD. and Sancar, A. (2016), "Genomewide kinetics of DNA excision repair in relation to chromatin state and mutagenesis", *Proc. Natl. Acad. Sci. U. S. A.* **113**(6):E2124-E2133 ***Equal contribution**
 19. Hu, J. *, **Adar, S.** *, Selby, PY., Lieb, JD. and Sancar, A. (2015), "Genome-Wide analysis of human global and transcription-coupled excision repair of UV damage at single-nucleotide resolution", *Genes and Development* 29:948-960. ***Equal contribution**
 20. Annayev, Y., **Adar, S.**, Chiou, YY., Lieb, JD., Sancar, A., Ye, R. (2014) "Gene model 129 (gm129) encodes a novel transcriptional repressor that modulates circadian gene expression." *J. Biol. Chem.* 289(8):5013-24.
 21. ENCODE Project Consortium (2012), "An integrated encyclopedia of DNA elements in the human genome" *Nature* 489(7414):57-74
 22. **Adar, S.**, Izhar, L. Hendel, A., Geacintov, N. and Livneh, Z (2009). "Repair of gaps opposite lesions by homologous recombination in mammalian cells" *Nucleic Acid Research* **37**(17):5737-48.
 23. Shachar, S., Ziv, O., Avkin, S., **Adar, S.**, Wittschieben, J., Reibner, T. Chaney, S., Friedberg, EC., Wang, Z., Carell, T., Geacintov, N., (2009) "Two-Polymerase Mechanisms Dictate Error-Free and Error-Prone Translesion DNA Synthesis in Mammals." *EMBO J* 28(4): 383-393.
 24. **Adar, S.** and Livneh, Z (2006). "Translesion DNA synthesis across non-DNA segments in cultured human cells". *DNA Repair* 5(4):479-90.
 25. Avkin, S., **Adar, S.**, Blander, G. and Livneh, Z. (2001). "Quantitative measurement of translesion replication in human cells: evidence for bypass of abasic sites by a replicative DNA polymerase." *Proc. Natl. Acad. Sci. U. S. A.* **99**(6): 3764-9.

Academic activities

Head of the genetics and genomics undergraduate program	<i>2022-present</i>
Organizing Science Abroad meetings for PhD students interested in a postdoc.	<i>2019-present</i>
Co-head of the Young Faculty Forum	<i>2019-2021</i>
Member of the Faculty Committee for gender equality	<i>2019-present</i>
Member IMRIC scholarship committee	
Member of the Faculty Tsabam Committee	<i>2018-present</i>
Organizing the Faculty lecture series	<i>2017-present</i>
Meeting to encourage woman graduate students to continue for a postdoc	<i>2017-present</i>

Outreach activities

Panel Chair – “women in Science” at the Institute for Medical Research Israel-Canada retreat	<i>2022</i>
Webinar “First steps in starting a lab”, ScienceAbroad	<i>2022</i>
Podcast series on “The human genome”, “Hamaabada”, Israeli network (Kan)	<i>2021</i>
News interview on lung cancer and mutations	<i>2020</i>
Member of the scientific advisory board for the Blumefield Museum of Science in Jerusalem	<i>2018-present</i>
Young Scientist and Innovator competition judge, Museum of Science in Jerusalem	<i>2018-present</i>

Teaching

Course coordinator, “Selected topics in genetics and genomics”	<i>2023-present</i>
Course coordinator, BSc Lab Experience in Genetics and Genomics	<i>2023-present</i>
Course coordinator, BSc Seminar in Genetics and Genomics	<i>2023-present</i>
Course coordinator, MSc Seminar in Genetics	<i>2021-present</i>
Section on Introduction to Genetics in “Introduction to Cell Biology” for pharmacy students	<i>2019-present</i>
Course coordinator, “Molecular Biology” Advanced graduate course	<i>2019-present</i>
Section on DNA repair in “Molecular Biology” Advanced graduate course	<i>2018-present</i>
Section on Introduction to Genetics in “Biology of the Cell” for Medical students	<i>2018-present</i>
Section on DNA damage in “Molecular Medicine and Oncogenomics” Advanced graduate course	<i>2017-present</i>