

Prof. Mira Barda-Saad

Professor of Immunology | Laboratory of Molecular and Applied Immunology

The Mina & Everard Goodman Faculty of Life Sciences
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IMMUNOLOGY • NK-CELL BIOLOGY • CANCER IMMUNOTHERAPY • MECHANOBIOLOGY

PROFILE

Immunologist studying the molecular and biophysical mechanisms that govern lymphocyte activation, with a major focus on natural killer (NK) cells, immune-cell signaling, cytoskeletal regulation, mechanotransduction, tumor-induced dysfunction and therapeutic immune reprogramming. Her laboratory integrates fundamental immunology with advanced imaging, functional genomics, biophysics and nanomedicine to identify new strategies for cancer immunotherapy.

ACADEMIC APPOINTMENTS & TRAINING

- Full Professor, The Mina & Everard Goodman Faculty of Life Sciences, Bar-Ilan University, 2018–present.
- Faculty member at Bar-Ilan University since 2006; research in molecular and applied immunology, leukocyte biology, and immune-cell signaling.
- Visiting Postdoctoral Fellow, National Cancer Institute, NIH, Bethesda, USA, 2001–2006: Molecular Immunology and Signal Transduction; guided by: Dr. Lawrence E. Samelson.
- Postdoctoral Fellow, Weizmann Institute of Science, 1999–2001: Molecular Immunology; guided by: Prof. Dov Zipori.
- PhD, Molecular and Cellular Biology, Bar-Ilan University / Weizmann Institute of Science, 1999, summa cum laude.
- MSc, Experimental Hematology and Microbiology, Bar-Ilan University, cum laude; BSc, Biology, Bar-Ilan University, cum laude.

RESEARCH FOCUS

- Natural killer (NK) cell activation, dysfunction, and exhaustion in the tumor microenvironment.
- Immune-cell signaling and intracellular checkpoints, including SHP-1 and calcium-dependent regulatory networks.
- Actin cytoskeleton, WASp, and immunological synapse organization.
- Immune-cell mechanobiology and mechanotransduction
- Therapeutic reprogramming of dysfunctional immune cells using RNA technologies, genome editing, small molecules and nanoparticle delivery.

SELECTED SCIENTIFIC LEADERSHIP

- President, Federation of Israeli Experimental Biology Societies (FISEB), 2020–2023.
- President, Israel Immunological Society, 2016–2020.
- Israeli representative to the European Federation of Immunological Societies (EFIS) and the International Union of Immunological Societies (IUIS), 2017–2020.

SELECTED HONORS

- Award for Excellence in Research, Israel Cancer Association, 2025.
- Rector Award for Innovation in Scientific Research, Bar-Ilan University, 2018.
- Leon and Maria Taubenblatt Award for Excellence in Medical Research, 2009.
- Fellows Award for Research Excellence (FARE), NIH, 2004.

SELECTED RESEARCH SUPPORT

Competitive national and international programs have supported this research, including the Israel Science Foundation (ISF), U.S.–Israel Binational Science Foundation (BSF), Israel Cancer Association, Israel Ministry of Innovation, Science and Technology, and translational/bioconvergence programs.

SELECTED PUBLICATIONS

- **Sabag B, Puthenveetil A, Levy M, et al., Barda-Saad M.** Dysfunctional natural killer cells can be reprogrammed to regain anti-tumor activity. *The EMBO Journal*, 2024.
- **Biber G, Sabag B, Raiff A, et al., Barda-Saad M.** Modulation of intrinsic inhibitory checkpoints using nanocarriers to unleash NK cell activity. *EMBO Molecular Medicine*, 2022.
- **Ben-Shmuel A, Sabag B, Puthenveetil A, et al., Barda-Saad M.** Inhibition of SHP-1 activity by PKC- θ regulates NK cell activation threshold and cytotoxicity. *eLife*, 2022.
- **Biber G, Ben-Shmuel A, Noy E, et al., Barda-Saad M.** Targeting the actin nucleation promoting factor WASp provides a therapeutic approach for hematopoietic malignancies. *Nature Communications*, 2021.
- **Matalon O, Ben-Shmuel A, Kivelevitz J, et al., Barda-Saad M.** Actin retrograde flow controls natural killer cell response by regulating the conformation state of SHP-1. *The EMBO Journal*, 2018.
- **Barda-Saad M, Braiman A, Titerence R, Bunnell SC, Barr VA, Samelson LE.** Dynamic molecular interactions linking the T cell antigen receptor to the actin cytoskeleton. *Nature Immunology*, 2005.

SELECTED CURRENT & RECENT RESEARCH DIRECTIONS

- Mechanotransduction as a regulator of NK-cell signaling and anti-tumor function.
- Molecular drivers and temporal programs of NK-cell dysfunction in solid tumors.
- Reprogramming dysfunctional NK cells through intracellular checkpoint targeting, RNA-based approaches and nanobiology.
- WASp-centered signaling and cytoskeletal mechanisms in immune function and hematologic disease.
- Integration of advanced molecular imaging, flow cytometry, transcriptomics, genome editing, 3D tumor models and in vivo studies.

TEACHING

- Introduction to Immunology.
- Control Mechanisms of the Immune Response.
- Undergraduate and graduate research seminars.

PROFESSIONAL CONTACT

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