Gonen Ashkenasy
Professor of Chemistry, Chemistry Department, Ben Gurion University of the Negev

Professional Preparation:
1994, BSc, Chemistry, Technion, Haifa, Israel
1997, MSc, Organic Chemistry, Weizmann Institute, Israel
2002, PhD, Organic Chemistry, Weizmann Institute, Israel
2002-5, HFSP Fellowship, postdoctoral research, The Scripps Research Institute, La Jolla, CA

Professional Appointments:
2023 - Director, Minerva Center for Studying the Planetary Emergence of Life
2016-18 & 2020-23 Chair, Department of Chemistry, Ben Gurion University, Israel
2018-19 Visiting Professor, Advance Science Research Center (ASRC), City University of New York
2015- Professor of Chemistry, Department of Chemistry, Ben Gurion University, Israel
2011-15 Associate Professor, Department of Chemistry, Ben Gurion University, Israel
2007- Chair of the "Edmond J. Safra Center for the Design and Engineering of Biopolymers", Ben Gurion University, Israel
2006-11 Assistant Professor, Department of Chemistry, Ben Gurion University, Israel
2005-6 Visiting scientist, The Scripps Research Institute, La Jolla, USA
2001-5 Research associate, The Scripps Research Institute, La Jolla, USA

Short research statement: THE SYSTEMS CHEMISTRY OF PEPTIDE NETWORKS
The main research effort in the Ashkenasy lab is devoted to the design and synthesis of multi-component chemical systems, termed molecular networks, and for the analysis of their dynamic self-organization. This study, which is central to the *Systems Chemistry* field, is inspired by the complexity and high-order observed by molecular networks within cells. Our findings can be used for understanding the organizational principles of biological systems, to shine light on plausible scenarios in early molecular evolution and the origins of life, and to develop devices for nanotechnology and biotechnology. We use peptides and proteins as the active components in these studies, and thus the observed structure-function relationships are further used to study fundamental processes, such as protein folding and protein interactions with small molecules and bio-macromolecules.

Leadership positions in Systems Chemistry and the Origin of Life Fields.
1. Chair of the "Edmond J. Safra Center for the Design and Engineering of Biopolymers" since 2007. The research center mainly focuses on a multi-level design approach, as well as preparation and characterization, of biopolymers with novel functionality thus serving as a focal point for cutting edge research in fields related to nano-biotechnology. **2.** Since 2013, a committee member and Chair (2013-16) of the Israel Society for Astrobiology and the Study of the Origin of Life (Ilasol). Several times head of the ILASOL annual meetings organization committee. **3.** Management committee member and Vice Chair of two European COST Actions on systems chemistry (CM0703 and CM1304; 2011-2020), which brought together about 100 European research groups active in the areas of origin of life, far-from-equilibrium systems and supramolecular chemistry. **4**. Founder and co-chair of the 1st Gordon Research Conference on Systems Chemistry (July 2018). **5.** Director of the Minerva Center for Studying the Planetary Emergence of Life (from 2023). The center research focuses on studying complex adaptive systems formation and evolution - from building blocks to reproducing adaptive networks.

Teaching Activities
1. Organic Chemistry course for 2nd year undergraduate chemistry students.
2. Physical Organic Chemistry course for 3rd year undergraduate chemistry students.
3. Organic Chemistry Laboratory course for 2nd year undergraduate chemistry and chemical engineering students.
4. Selected Topics in Supramolecular Chemistry course for graduate chemistry students.

5. Supervisor of undergraduate project students every year.

Mentoring:

Around 20 M.Sc. students, 15 Ph.D. students, and 15 postdoctoral researchers have graduated from our lab (as of the beginning of 2026).

Currently the lab includes 1 MSc and 6 PhD students, 3 postdoctoral researchers, a senior research associate, and lab manager.

Collaborators:

Professor Nurit Ashkenasy @ Ben Gurion University, Israel

Professor Ayelet David @ Ben Gurion University, Israel

Professor David G. Lynn, Emory University, GA, USA

Professor Andres de la Escosura @ UAM, Madrid, Spain

Professor Yifat Miller @ Ben Gurion University, Israel.

Selected Publications

1) M. Samanta, N. Saad, D. Wu, N.S.A. Crone, K. Abramov-Harpaz, C. Regev, R. Cohen-Luria, A.L. Boyle, Y. Miller, A. Kros, G. Ashkenasy "A Photo-Switchable Peptide Fibril Esterase" *Angew. Chem. Int. Ed.* **2025.** https://doi.org/10.1002/anie.202413810
2) I. Maity, D. Dev, R. Cohen-Luria, N. Wagner, G. Ashkenasy "Engineering reaction networks by sequential signal processing" *Chem* (Cell Press) **2024**, 10, 1132-1146.
3) D. Dev, N. Wagner, B. Pramanik, B. Sharma, I. Maity, R. Cohen-Luria, E. Peacock-Lopez, G. Ashkenasy "A Peptide-Based Oscillator" *J. Am. Chem. Soc.* **2023**, 145, 26279–26286.
4) A.K. Bandela, N. Wagner, H. Sadihov, S. Morales-Reina, A. Chotera-Ouda, K. Basu, R. Cohen-Luria, A. de la Escosura, G. Ashkenasy "Primitive selection of the fittest emerging through functional synergy in nucleopeptide networks". *Proc. Natl. Acad. Sci. USA*, **2021**, 118, 9 e2015285118.
5) C. Glionna, V. Kumar, G. Le Saux, B. Pramanik, N. Wagner, R. Cohen-Luria, G. Ashkenasy, N. Ashkenasy "Dynamic Surface Layer Coiled Coil Proteins Processing Analog-to-Digital Information" *J. Am. Chem. Soc.* **2021**, 143, 17441−17451.
6) I. Maity, D. Dev, K. Basu, N. Wagner, G. Ashkenasy "Signaling in Systems Chemistry: Programing Gold Nanoparticles Formation and Assembly Using a Dynamic Bistable Network". *Angew. Chem. Int. Ed.* **2021**, 60, 4512-4517.
7) Maity, I., Wagner, N., Mukherjee, R., Dev, D., Peacock-Lopez, E., Cohen-Luria, R. & Ashkenasy, G. A chemically fueled non-enzymatic bistable network. *Nat. Commun.* **2019**, 10, 1-9.
8) A. Chotera, H. Sadihov, R. Cohen-Luria, P-A. Monnard, G. Ashkenasy "Functional Assemblies Emerging in Complex Mixtures of Peptides and Nucleic Acid–Peptide Chimeras" *Chem. Eur. J.* **2018**, 24, 10128.
9) J. Nanda, B. Rubinov, D. Ivnitski, R. Mukherjee, E. Shtelman, Y. Motro,Y. Miller, N. Wagner, R.C. Luria, G. Ashkenasy "Emergence of native peptide sequences in prebiotic replication networks" *Nature Commun.* **2017**, 8, 434.