Ayala Lampel

Shmunis School of Biomedicine and Cancer Research
The George S. Wise Faculty of Life Sciences
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ACADEMIC APPOINTMENTS:

Assistant Professor, Tel Aviv University August 2019-present
School of Molecular Cell Biology and Biotechnology

Postdoctoral Research Associate 2015-2019
Nanoscience Initiative, Advanced Science Research Center
City University of New York

EDUCATION

Ph.D., Biotechnology, Tel Aviv University 2009-2014
Direct Track for Distinguished Students
Advisor: Prof. Ehud Gazit
Dissertation: "Molecular Studies of HIV Capsid Assembly: Biophysical Characterization and Antiviral Design Tools".

B.Sc. in Neuroscience, Tel Aviv University 2005-2008
Interdisciplinary Program in Neuroscience for Distinguished Students

RESEARCH AND PROFFESIONAL EXPERIENCE

Advanced Science Research Center CUNY, Nanoscience Initiative, New York, NY, USA 2015-2019
Postdoctoral Research Advisor: Prof. Rein Ulijn
Investigate sequence to structure relationship in peptide self-assembly and develop bio-inspired materials design approach utilizing supramolecular peptide nanostructures

Scientific advisor *Seed Inc.* LA, CA USA 2019-present

Reviewer, *Chem* (Cell Press), *Chemistry of Materials*, *Macromolecules, ACS Applied Biomaterials*, *The Journal of Physical Chemistry* (American Chemical Society), *Soft Matter* (Royal Society of Chemistry), European Research Council (ERC). 2018-present

Hunter College, CUNY, New York, NY, USA 2016-2019
Teaching Assistant, Chem 36000: Introduction to Nanotechnology

NSF NYCRIN Regional I-Corps Cohort, New York, NY, USA 2016
Entrepreneurial Lead

Tel Aviv University, The Department of Molecular Microbiology and Biotechnology 2009-2015
Tel Aviv, Israel
Graduate Research Advisor: Prof. Ehud Gazit
Investigated the biophysical properties of HIV-1 capsid self-assembly and develop novel antiviral design tools

The Center for Educational Technology, Tel Aviv, Israel 2011-2013
Head of Biotechnology Final Exams Committee
Structuring and compositing the Israeli high-school final exams in biotechnology.

Tel Aviv University, Tel Aviv, Israel 2006-2008
Undergraduate Research Advisor: Prof. Ehud Gazit
Studied the potential of short aromatic peptides as inhibitors of β -amyloid self-assembly

Activities and Organization of International Conferences

Co-organizer, Systems Chemistry symposium, Weizmann Institute of Science, Israel, February 2024 (150 participants expected).

Co-organizer, 13th Annual Meeting of the Fred Chaoul Nano Center Annual workshop, Dead Sea, Israel, January 2022.

Co-organizer, EMBO conference "Designing Functional Biomolecular Assemblies: Beyond Biology", September 2021.

Chair the session "Polymeric Biopolymers". 30th Annual Conference of the European Society for Biomaterials (ESB), Dresden, Germany, September 2019.

Session Chair, the Italy-Israel Binational Meeting on Nanomedicine and Nanotechnology for Medical Applications, Tel Aviv, Israel, October 2019.

Publications

Peer-Reviewed Publications

1. Baruch Leshem, A.B., Sloan-Dennison, S., Massarano, T., Ben-David, S., Graham, D., Faulds, K., Gottlieb, H., Chill, J.* and **Lampel, A.***, Biomolecular condensates formed by designer minimalistic peptides. **Nature Communications,** 2023, *Accepted.*
2. Katzir, I., Haimov, E. and **Lampel, A.*** Tuning the dynamics of viral-factories-inspired compartments formed by peptid-RNA liquid-liquid phase separation. **Advanced Materials**, 2022, 2206371. ***Selected to feature as a news article in Advanced Science News. *Selected to feature on the inside cover.***
3. Wulf, V., Bichachi, E., Hendler‐Neumark, A., Massarano, T., Baruch Leshem, A.B., **Lampel, A*.** and Bisker, G.*, Multicomponent system of single‐walled carbon nanotubes functionalized with a melanin‐inspired material for optical detection and scavenging of metals. **Advanced Functional Materials**, 2022, 2209688. ***co-corresponding authors. *Selected to feature in the front cover.***
4. Massarano, T., Baruch Leshem, A. E., Weitman, M., and **Lampel, A*.** Spatiotemporal control of melanin synthesis in liquid droplets, **ACS Applied Materials & Interfaces**. 2022, 14, 20520-20527. ***Selected to feature as a supplementary cover.***
5. Brito, A., Dave, D., **Lampel, A.,** Castro, V.I., Kroiss, D., Reis, R.L., Tuttle, T., Ulijn, R.V., Pires, R.A. and Pashkuleva, I., 2021. Expanding the conformational landscape of minimalistic tripeptides by their O-glycosylation. **JACS**, 2021, 143, 19703-19710.
6. Sloan-Dennison, S., **Lampel, A**., Raßlenberg, E., Ulijn, R. V., Smith, E., Faulds, K., & Graham, D. "Elucidation of the structure of supramolecular polymorphs in peptide nanofibres using Raman spectroscopy". **Journal of Raman Spectroscopy**, 2021, 52, 1108-1114.
7. **Lampel, A***., McPhee, S. A., Kassem, S., Sementa, D., Massarano, T., Aramini, J. M., ... & Ulijn, R. V*. Melanin-inspired chromophoric microparticles composed of polymeric peptide pigments. **Angewandte Chemie International Edition**, 2021. 60, 7564-7569. *** co-corresponding authors.** *****Selected as a Research Highlight in Nature.***
8. Reddy, S.M.M., Raßlenberg, E., Sloan-Dennison, S., Hesketh, T., Silberbush, O., Tuttle, T., Smith, E., Graham, D., Faulds, K., Ulijn, R.V.*, and Ashkenasy, N.*, **Lampel, A***. Proton-conductive melaninlLike fibers through enzymatic oxidation of a self-assembling peptide, **Advanced Materials**, 2020, 32, 2003511.
9. **Lampel, A***. Biology-inspired supramolecular peptide systems. **Chem** 2020, 6, 1222-1236. *Invited Perspective.
10. Pappas, C., Wijerathne, N., Sahoo J. K., Jain, A., Kroiss, D., Sasselli, I. R., Pina, A. S., **Lampel, A**., and Ulijn, R. V. Spontaneous aminolytic cyclization and self‐assembly of dipeptide methyl esters in water. **ChemSystemsChem**, 2020.
11. Ulijn, R.V. and **Lampel, A**.* Order/disorder in protein and peptide-based biomaterials. **Israel Journal of Chemistry**, 2019, 60, 1129-1140. (Invited review in the special issue 'Young Israelis Stars').
12. **Lampel, A**., Tuttle, T., Ulijn, R.V. Guiding principles for peptide nanotechnology through directed discovery. **Chemical Society Reviews**. 2018, *47*, 3737-3758.

13. Zhang, C., Shafi, R., **Lampel, A.**, MacPherson, D., Pappas, C. G., Wang, T., Maldarelli C., Ulijn, R. V. Switchable Hydrolase Based on Reversible Formation of Supramolecular Catalytic Site Using a Self - Assembling Peptides. **Angewandte Chemie International Edition**. 2017, *129*, 14703-14707.

14. **Lampel, A.**, McPhee S. A., Park, H.-A. Scott, G. G., Humagain, S., Hekstra, D. R., Yoo, B., Frederix P. W. J. M., Li, T.-D., Abzalimov R. R., Greenbaum S. G., Tuttle, T., Chunhua H., Bettinger, C. J., Ulijn, R. V. Polymeric peptide pigments with sequence-encoded properties. **Science** 2017, *356*, 1064-1068.

    - Highlighted in *Chem* and *Science*; Major media coverage: WYNC Science Friday, Science Daily, Materials Today, MRS Bulletin, Chemical & Engineering News, Cosmos.

15. Alakpa, E. V., Jayawarna, V., **Lampel, A.**, Burgess, K. V., West, C. C., Bakker, S. C.J, Roy, S., Javid, N., Fleming, S., Lamprou, D. A., Yang, J., Miller, A., Urquhart, A. J, Frederix, P. W.J.M., Hunt, N. T, Péault, B., Ulijn, R. V., Dalby, M. J. Tunable supramolecular hydrogels for selection of lineage guiding metabolites in stem cell cultures. **Chem** 2016, *1*, 298-319.

    - Highlighted in *Cell Stem Cell*: Stem Cell Fate Is a Touchy Subject, *Cell Stem Cell.* 19, 289-290, 2016.

16. **Lampel, A.**, Varenik M., Regev O., Gazit, E. Hierarchical multi-step organization during viral capsid assembly. **Colloids and Surfaces B: Biointerfaces** 2015, *136*, 674-677.

17. Mondal, S*., Adler-Abramovich, L*., **Lampel, A.**, Bram, Y., Lipstman, S., Gazit, E. Formation of functional super-helical assemblies by constrained single heptad repeat. **Nature Communications** 2015*, 6.* *Authors equally contributed.

18. **Lampel, A.**, Bram, Y., Ezer A., Shaltiel-Kario R., Saad, J. S., Bacharach, E., Gazit, E. Targeting the early step of building block organization in viral capsid assembly. **ACS Chemical Biology** 2015, *10*, 1785-1790.

19. **Lampel, A.**, Elis E., Guterman, T., Shapira S., Marco, P., Bacharach, E., Gazit, E. α -Aminoisobutyric acid incorporation induces cell permeability and antiviral activity of HIV-1 major homology region fragments. **Chemical Communications** 2015, *51*, 12349-12352.

    - *Front cover of Chem. Comm. 62nd issue.*

20. Bram, Y., **Lampel, A.**, Shaltiel-Karyo, R., Ezer, A., Scherzer-Attali, R., Segal, D., Gazit, E. "Monitoring and targeting the initial dimerization stage of amyloid self-assembly". **Angewandte Chemie International Edition** 2014, *54*, 2062-2067.

    - Highlighted in *Nature Materials*: Dimer Detection, *Nat. Mater.* 2015, *14*, 134.

21. **Lampel, A.**, Yaniv, O., Berger, O., Bacharach, E., Gazit, E., Frolow, F. A triclinic crystal structure of the carboxy-terminal domain of HIV-1 capsid protein with four molecules in the asymmetric unit reveals a novel packing interface. **Acta Crystallographica Section F** 2013*, F69*, 602-606.

22. **Lampel, A.**, Bram, Y., Levy-Sakin, M., Bacharach, E., Gazit, E. The effect of chemical chaperones on the assembly and stability of HIV-1 capsid protein. **PLOS ONE** 2013, *8(4):* e60867.

23. Frydman-Marom, A., Convertino, M., Pellarin, R., **Lampel, A.**, Shaltiel-Kario, R., Caflisch, C., Shalev, E. D., Gazit, E. Structural basis for inhibiting β-amyloid oligomerization by a non-coded β-breaker-substituted endomorphin analogue. **ACS Chemical Biology** 2011, *6*, 1265-1276.

PATENTS

1. Ulijn, R. V., **Lampel, A.,** Tuttle, T., Scott, G., McPhee, S. and Bettinger, C. "Self-assembling peptide polymer". US Patent 11,021,516, 2021.
2. **Lampel, A**., Massarano, T., Baruch Leshem, A. E. Methods and compositions for melanin synthesis. US Patent Application No. 63/134,789 filed 07/01/2021.
3. **Lampel, A**., Baruch Leshem, A. E., Netzer, A., Peptide liquid droplets and methods of using the same. 2021, US Patent Application No. 63/242,071 filed 09/09/2021.
4. **Lampel A.** and Katzir, I. Tuning the dynamics of viral factories-inspired compartments formed by peptide-RNA liquid-liquid phase separation. US Provisional Patent Application No. 63/398,673.

REVIEWING ACTIVITIES

Guest Editor of a Special issue *Peptide and Protein Self-Assembly and Interactions* of Israel Journal of Chemistry (Wiley).	2022
Reviewer for the European Research Council (ERC) Advanced Grant 2021 call.	2021
External Examiner of research Ph.D. theses, Ben-Gurion University, Israel.	Since 2020
Reviewer for Nature Chemistry, Nature Communications, Cell Press journal Chem, American Chemical Society journals: Chemistry of Materials, Macromolecules, ACS Applied Biomaterials, the Journal of Physical Chemistry, and Royal Society of Chemistry journals including Soft Matter.	Since 2019

AWARDS

Tel Aviv University Dean's list for Excellence in Teaching	2022
Finalist, Burroughs Wellcome Fund Award (BWF)	2018
Postdoctoral Fellowship, the Israeli Council for Higher Education	2015-2017
Postdoctoral Travel Award, CUNY	2016
Katzir Training Fellowship, Israel Academy of Sciences and Humanities	2014
Research & Training Doctoral Fellowship, Naomi Prawer Kadar Foundation	2014
Best Poster Award, Functional Peptide and Protein Nanostructures Seminar	2014
Travel Fellowship, Joan and Jaime Constantiner Institute for Molecular Genetics	2011
Travel Fellowship, Manna Institute for Plant BioScience	2011

Doctoral Scholarship, Tel Aviv University Ph.D. Neuroscience Program 2009

GRANTS

Israel Science Foundation (ISF) - Individual Research Grants (335,172 USD)	2021-2025
MAGNETON Israel Innovation Authority, with Maruho Israel Innovation (208,344 USD)	2022-2023
Israel Science Foundation (ISF) - New Faculty Equipment Grants (8,667 USD)	2021-2025
German Research Foundation (DFG) (477,481 USD)	2021-2024
Colton-Nadal Foundation (41,606 USD)	2021-2022

INVITED PRESENTATIONS

Invited speaker, Phase Separation Regulated Life, In and Outside of Cells, Singapore 2023.

Invited speaker, In Phase? Physics and Biology of Protein Condensates Symposium, Weizmann Institute of Science, Rehovot, Israel 2022.

Invited speaker, the 35th Annual Meeting of the Israel Society for Astrobiology and the Study of the Origin of Life (ILASOL), Jerusalem, Israel 2022.

Invited speaker, The 35th Annual Meeting of the Israel Chemical Society (ICS), Jerusalem, Israel 2022.

Invited speaker, NANOIL, Jerusalem, Israel 2021.

Invited speaker, ICRS-PAT International Conference of Controlled Release Society & Polymer for Advanced Technologies Society, Maalot Tarshiha, Israel 2021.

Invited speaker, EMBO Designing Functional Biomolecular Assemblies: Beyond Biology, international conference, virtual, 2021.

Invited speaker, the 35th Annual Meeting of the Israel Chemical Society, Jerusalem, Israel, February 2020.

Invited keynote speaker, the 30th Annual Conference of the European Society for Biomaterials, Dresden, Germany, September 2019.

Invited speaker, Incorporating Technology symposium. New York, NY, USA, November 2018.

Invited speaker, the 255th American Chemical Society (ACS) National Meeting, New Orleans, USA, March 2018.

Selected talk for the Materials Research Society (MRS) Spring Meeting, Phoenix, USA, April 2018.

Selected talk for the Materials Research Society (MRS) Fall Meeting, Boston, USA, November 2017.

Invited speaker, Estee Lauder headquarters, Long Island, NY, USA 2017.

Invited speaker, GPLLI Symposium, Columbia University, November, 2017.

Invited speaker, Bio-Inspired Nanomaterials symposium, New York, NY, USA, February 2017.

Invited speaker, The 6th Biopolymers and Bioplastics International conference, San Antonio, TX, USA 2016.