

GALIA MAAYAN

Assistant Professor, Schulich Faculty of Chemistry
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Academic Appointments

Sept 2019-current Associate Professor, Schulich Faculty of Chemistry, Technion, Israel

March 2012-Aug 2019 Assistant Professor, Schulich Faculty of Chemistry, Technion, Israel

Postdoctoral Employment

Aug 2009-Jul 2011 Research with Prof. George Christou, Department of Chemistry, University of Florida, Gainesville, FL.

Jan 2007-Jul 2009 Research in collaboration with Prof. Michael D. Ward and Prof. Kent Kirshenbaum, Molecular Design Institute, Department of Chemistry, New York University, New York, NY.

Education

2001-2006 Ph.D. studies in the group of Prof. Ronny Neumann, Department of Organic Chemistry, Weizmann Institute of Science, Rehovot, Israel.
Topic of research: "New Systems for Oxidation Reactions Catalyzed by Polyoxometalates".

1999-2000 M.Sc. in the group of Prof. Abraham Shanzer, Department of Organic Chemistry, Weizmann Institute of Science, Rehovot, Israel.
Topic of research: "Synthesis, Characterization and Utilization of a New Ligand for the Preparation of Heteronuclear Complexes"

1995-1998 B.Sc. in Chemistry. Tel-Aviv University, Israel (MAGNA CUM LAUDE)

Selected Awards

- 2019 Humboldt Research Fellowship for Experienced Researchers
- 2018 Ray & Miriam Klein Research Prize Fund for an outstanding research work that contributes to Israel's industry, technology, security or scientific standing.
- 2011 National Science Foundation (NSF) scholar in Green Chemistry.
- 2010 Joseph Breen Memorial Fellowship in Green Chemistry (ACS award).
- 2009 The Stereochemical Society of Greater New York travel award.
- 2003 First-place poster award, The VI Summer School on Green Chemistry, Italy.

Publications (11 most important)

1. Totan Ghosh, George Christou and Galia Maayan “Efficient Homogeneous Electrocatalytic Water Oxidation by a Manganese Cluster with Overpotential of Only 74 mV”, *Angew. Chem. Int. Ed.* **2019**, 58, 2785–2790.
2. Maria Baskin, Hui Zhu, Zheng-Wang Qu, Jordan Chill, Stefan Grimme and Galia Maayan “Folding of Unstructured Peptoids and Formation of Hetero-Bimetallic Peptoid Complexes upon Side-Chain-to-Metal Coordination”, *Chem. Sci.* **2019**, 10, 620-632.
3. Totan Ghosh, Pritam Ghosh and Galia Maayan “A Copper-Peptoid as a Highly Stable, Efficient and Reusable Homogeneous Water Oxidation Electrocatalyst”, *ACS Catal.* **2018**, 8 (11) 10631-10640.
4. Totan Ghosh, Natalia Fridman, Monica Kosa and Galia Maayan “Self-Assembled Cyclic Structures from Copper (II)-Peptoids”, *Angew. Chem.* **2018**, 57, 7703-7708.
5. Galia Maayan*, Naama Gluz and George Christou “A Bioinspired Soluble Manganese Cluster as a Water-Oxidation Electrocatalyst with Low Overpotential”, *Nat. Catal.* **2018**, 1, 48-54.
6. Darapanani Chandra Mohan, Arghya Sadhukha and Galia Maayan “A Metallopeptoid as an Efficient Bioinspired Cooperative Catalyst for the Aerobic Oxidative Synthesis of Imines”, *Journal of Catalysis* **2017**, 355, 139–144.
7. Maria Baskin and Galia Maayan “A rationally designed metal-binding helical peptoid for selective recognition processes”, *Chem. Sci.*, **2016**, 7, 2809-2820.
8. Prathap Jeya Kaniraj and Galia Maayan “Metallopeptoids as Efficient Biomimetic Catalysts”, *Chem. Commun.* **2015**, 51, 11096-11099.
9. **Galia Maayan**, Michael D. Ward and Kent Kirshenbaum, “Folded Biomimetic Oligomers for Enantioselective Catalysis”, *Proceedings of the National Academy of Science USA*, **2009**, 106 (33), 13679-13684.
10. **Galia Maayan**, Kent Kirshenbaum and Michael D. Ward, “Metallopeptoids.” *Chemical Communications*, **2009**, 56-58.
11. **Galia Maayan**, Ronit Popovitz-Biro and Ronny Neumann, “Polyoxometalate Nanoparticles and Their Improved Catalytic Activity for the Aerobic Oxidation of Sulfides”, *Journal of the American Chemical Society*, **2006**, 128, 4968-4969.

Patents

1. **Galia Maayan** and Prathap K. Jeya, “A Facile and general method to solubilize peptoids in water via a minor modification to their backbone, which does not alter their sequence and structure.” *Israel patent application no. 251942*.
2. George Christou, **Galia Maayan**, “Polynuclear Metal Clusters, Methods of Making and Methods of Use Thereof.” PCT Int. Appl. No. PCT/US2012/035808, **2012**, 30pp.
3. Kent Kirshenbaum, **Galia Maayan**, Michael Ward, “Preparation of Peptoids for Substrate-Selective Catalysis including Asymmetric Catalysis.” PCT Int. Appl. U.S. Serial No. 61/053,958, **2009**, 80pp.

Grant Support

1. Co-Investigator, Binational Science Foundation Regular Grant (#2016254) “Photoswitchable Metallopeptides”; \$200,000; 2017-2021.

2. Co-PI, Israel Science Foundation (Institutional Equipment Grant #2220/16) “Equipment for Mass-Spectrometry MALDI-TOF”; \$178,000; 2016-2017.
3. PI, Israel Science Foundation (Personal Grant #395/16) “Rationally Designed Metal-Binding Foldamers for Selective Recognition Processes”; \$310,000; 2016-2020.
4. Co-Investigator, Umbrella Cooperation Technion Aachen (# 2022186), “Selective Biomimetic Chelators for Metal ions”, \$30,000; 2015-2017.
5. Co-Investigator, Binational Science Foundation Startup Grant (#2012371) “Tailoring Zeolite Crystallization using De Novo Peptoid Growth Modifiers”; \$150,000; 2013-2015.
6. PI, The Solar Fuels I-CORE (Israeli Center of Research Excellence) New Faculty Grant, “A biomimetic approach for the synthesis of molecular catalysts for electrochemical and photochemical water splitting”; 1,755,000 NIS, 2013-2018.
7. PI, The Solar Fuels I-CORE (Israeli Center of Research Excellence) New Faculty Grant, “A biomimetic approach for the synthesis of molecular catalysts for electrochemical and photochemical water splitting”; 410,300 NIS (equipment).
8. PI, Marie Curie Career Integration Grants (#333034) “Conformational Control in Designed Biomimetic Metallofoldamers: Towards Functional Materials”; 100,000 Euro; 2013-2017.
9. PI, Irwin Tauben for Alzheimer & Crohn`s Research “Synthesis and Characterization of Metallopeptoids as Potential Therapeutics for Alzheimer Disease; \$5000; 2012-2013.

Selected Invited Lectures

1. “Bio-Inspired Cooperative Catalysis”, *Weizmann Institute of Science, Rehovot, Israel, Nov 15, 2018.*
2. “Bio-Inspired Cooperative Catalysis”, *The Hebrew University, Jerusalem, Israel, Nov 13, 2018.*
3. “Bio-Inspired Cooperative Catalysis” *Unistra-Israel symposium, Strasburg, France October 24-25, 2018. Invited.*
4. “Bio-Inspired Cooperative Catalysis” *International Conference in Honor of Prof. Dan Meyerstein's 80th Birthday, Ariel, Israel, October 3-5 2018. Invited.*
5. “Bio-Inspired Cooperative Catalysis”, *Wisconsin-Madison University, Madison, USA, Sept 20, 2018.*
6. “Bio-Inspired Cooperative Catalysis”, *New York University, NY, NY, USA, Sept 18, 2018.*
7. “Bio-Inspired Cooperative Catalysis”, *Yale University, New Heaven, CT, USA, Sept 13, 2018.*
8. “Bio-Inspired Cooperative Catalysis”, *Tufts University, Boston, MS, USA, Sept 10, 2018.*
9. “Bio-Inspired Cooperative Catalysis”, *MIT, Boston, MS, USA, Sept 12, 2018.*
10. “Bio-Inspired Cooperative Catalysis”, *Carnegie Mellon University, Pittsburgh, PA, USA, Sept 7, 2018.*
11. “Bio-Inspired Cooperative Catalysis”, *University of Pittsburgh, Pittsburgh, PA, USA, Sept 6, 2018.*
12. “Excitements and Challenges in Metallopeptoids Catalysis”, *3rd Foldamer Workshop, NY, NY, US, June 20-22, 2018*

13. "Biomimetic Utilization of Metal-Binding Peptoids for Cooperative Catalysis and Recognition", *The Third Biomimicry Conference – Academy & Industry, Tel Aviv University, Tel Aviv Israel, June 8, 2017.*
14. "Biomimetic Utilization of Metal-Binding peptoids for Folding, Recognition and Cooperative Catalysis", *University of Connecticut, Connecticut, US, Aug 13, 2015.*
15. "Biomimetic Utilization of Metal-Binding peptoids for Cooperative Catalysis, Folding and Recognition", *ICIQ, Tarragona, Spain, Feb 24-25, 2015.*
16. "Biomimetic Utilization of Metal-Binding peptoids for Cooperative Catalysis, and Recognition", *80st Annual Meeting of the Israel Chemical Society, Tel Aviv, Israel, February 9-10, 2015*
17. "Biomimetic Utilization of Metal-Binding peptoids for Cooperative Catalysis, Folding and Recognition", *Peptides & Proteins Molecules of Life, Gennevilliers (Paris), France, October 5-8, 2014. Plenary*
18. "Organic Transformations on Peptoid Oligomers in the Solid Phase", *6th EuChemS Organic Division Young Investigator Workshop, Larnaka, Cyprus, Aug 28-30, 2014.*
19. "Biomimetic Utilization of Metal-Binding peptoids for Cooperative Catalysis, Folding and Recognition", *Functional Peptide and Protein Nanostructures, Tzuba, Israel, May 25-28 2014.*
20. "Folded Biomimetic Oligomers: From Structure to Function", *Autonomous University de Barcelona, Spain, September 25, 2012.*
21. "Inorganic-Inorganic and Organic-Inorganic Nanomaterials for Catalytic Applications", *ICMAB, Barcelona, Spain, September 26, 2012.*

Oral contributions

1. "Recent Advances in Metallopeptoids: Electrocatalytic Water Oxidation and the First Examples of Metallopeptoid Helicates" *Bordeaux foldamers 2018 symposium, IECB, Bordeaux-Pessac, France, Sept 24-26, 2018.*
2. "Selective recognition and self-assembly by Cu(II) binding peptoids", *The copper Bioinorganic Chemistry Symposium (CuBICS 2018), Marseille, France, May 21-24, 2018.*
3. "A Self-Assembled Cyclic Structure and Electrocatalytic Water Oxidation from a Copper(II)-Peptoid", *10th Peptoid Summit, Berkeley, California, US, Aug 10-11, 2017.*
4. "A biomimetic approach for the design of manganese and copper based water oxidation electrocatalysts", *18th International Conference on Biological Inorganic Chemistry, Florianopolis, Brazil, July 31- Aug 5, 2017.*
5. "Fluorescent Ruthenium Complexes Based on 2,2'-Bipyridine Modified Peptoids", *81st Annual Meeting of the Israel Chemical Society, Tel Aviv, Israel, February 9-10, 2017*
6. "Metal binding as a new approach for peptoids folding", *Bordeaux foldamers 2016 symposium, IECB, Bordeaux-Pessac, France, Sept 26-28, 2016.*
7. "A biomimetic approach for the design of water oxidation electrocatalysts", *3rd Solar Fuels I-CORE Workshop, Nahsholim, Israel, Sept 12 -15, 2016.*
8. "Metallopeptoids as Efficient Cooperative Catalysts", *9th Peptoid Summit, Berkeley, California, US, Aug 6-7, 2015.*

9. "A Peptidomimetic Oligomer as a Highly Selective Chelator for Metal Ions", *17th International Conference on Biological Inorganic Chemistry, Beijing, China, July 20-24, 2015*.
10. "Metallopeptoids as Highly Efficient Biomimetic Catalysts", *17th International Symposium on Relations between Homogeneous and Heterogeneous Catalysis, Utrecht, The Netherlands, July 12-15, 2015*.
11. "Biomimetic Utilization of Metal-Binding peptoids for Cooperative Catalysis, and Recognition", *Bordeaux foldamers 2015 symposium, IECB, Bordeaux-Pessac, France, Jan 26-28, 2015*.

Press Reports

Related to: G. Maayan and R. Neumann, "Direct Aerobic Epoxidation of Alkenes Catalyzed by Metal Nanoparticles Stabilized by the $H_3PV_2Mo_{10}O_{40}$ Polyoxometalate." *Chem. Commun.* **2005**, 4595.

- Highlighted in *Green Chemistry*, 2005, 7, 763-764.

Related to: G. Maayan, M. D. Ward and K. Kirshenbaum, "Folded Biomimetic Oligomers for Enantioselective Catalysis", *PNAS USA*, **2009**, *106* (33), 13679.

- Kevin Fallon, "Molecules With A Twist", *NYU Alumni Magazine*, Issue # 14, Spring 2010.
http://www.nyu.edu/alumni.magazine/issue14/14_square_cuttingedge.html
- *Chemical Processing*, "Catalysts Get A New Twist", Sep 17, 2009.
<http://www.chemicalprocessing.com/articles/2009/195/>
- Jenny Leonard, "To Get A Reaction Molecules Do The Twist", *Futurity*, Aug 18, 2009. <http://www.futurity.org/science-technology/to-get-a-reaction-molecules-do-the-twist/>

Related to: our contributions in biomimicry

- Yael Halfman Cohen, "Biomimetic Chemistry – a Window to the Molecular World", Dec 2016. <http://biomimicrynews.blogspot.co.il/2016/12/blog-post.html>

Related to: G. Maayan*, N. Gluz and G. Christou "A Bioinspired Soluble Manganese Cluster as a Water-Oxidation Electrocatalyst with Low Overpotential", *Nat. Cat.* **2018**, *1*, 48-54.

- Highlighted in *Nature Catalysis*, 2018, 1, 10-11.
- <https://www.hayadan.org.il/hydrogen-fuel-production-inspired-by-photosynthesis-14011801>
- <http://biofuelsdigest.com/nuudigest/2018/01/15/affordable-green-hydrogen-it-is-here-near-or-nowhere-in-sight-again/>
- http://www.ifatmediasite.com/CustomMedia/S_ShowItem.aspx?ItemID=WesgvVemyzEgWk3Ht6lIOW==&InfoTypeID=1&PageIndex=0&BackTo=Newsletter