

SHORT CURRICULUM VITAE AND LIST OF PUBLICATIONS

• **Personal Details**

Name: Moshe Herzberg

Date and place of birth: May 2nd, 1968, Haifa, ISRAEL

Department of Desalination and Water Treatment, Zuckerman Institute for Water Research (ZIWR), The Jacob Blaustein Institutes for Desert Research (BIDR), Ben-Gurion University of the Negev, Sede-Boqer Campus, Midreshet Ben-Gurion, 84990, ISRAEL. Telephone: +972-8-6563520, +972-50-2029608, Fax: +972-8-6563503

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• **Education**

B.Sc. 1991 – 1995, Technion - IIT, Faculty of Chemical Engineering

Ph.D. 1998 – 2003, Technion - IIT, Faculty of Agricultural Engineering.

• **Employment History**

July 2020 till now, Full Professor (Tenure), Department of Desalination and Water Treatment, Zuckerman Institute for Water Research, Ben-Gurion University of the Negev. Sede-Boqer campus, ISRAEL

November 1, 2014 June 2020, Associate Professor (Tenure), Ben-Gurion University of the Negev.

October 1, 2011 – November 2014, Senior Lecturer (Tenure), Ben-Gurion University of the Negev.

10/2007 – 9/2011, Lecturer, Ben-Gurion University of the Negev.

9/2005 – 9/2007, Postdoc research fellow, Chemical Engineering Department, Yale University, New Haven, CT, USA

9/2004 – 8/2005, Postdoc research associate, Chemical Engineering Department, university of Connecticut, CT, USA

1/2003 – 9/2004, Postdoc research fellow, Faculty of Civil and Environmental Engineering, Technion – IIT, Haifa, ISRAEL

3/1998 – 8/2002, Teaching assistant at the Faculty of Agricultural Engineering in undergraduate courses: *Soil chemistry* and *Transport and pollution in soil*.

2/1995 – 2/1998, Project and process engineer at the department of technological services, Oil Refineries Ltd, Haifa, ISRAEL

1/1992 – 1/1995, Research assistant at TAMI-IMI (Institute for research and development of Israel chemicals group), Haifa, ISRAEL

• **Professional Activities** (in reverse chronological order)

5/2020 – Now Head – Desalination and Water Treatment Department, ZIWR, BIDR , BGU

1/2018-3/2020: Consulting - Hutchison Water – the usage of peptides as antifouling agents

1/2012-8/2019: Consulting - Mekorot Israel Water Company: Pretreatment effects on biofouling of brackish water desalination plants

3/2010 – 1/2011: Consulting - Hutchison Water Israel: The use of peptides from sea anemones to reduce biofouling of RO membranes

11-12/2009: Consulting - Veolia Environment, NF membrane biofouling autopsies.

10/2008 – 10/2009: Consulting - Teva Tech, Ramat Hovav, Fouling and Biofouling in membrane bioreactors.

Editor or member of editorial board of scientific or professional journal

Water, Membranes

Ad-hoc reviewer for journals

Water Research, Journal of Membrane Science, Environmental Science and Technology, Biomacromolecules, Langmuir, Applied and Environmental Microbiology, Environmental Microbiology, Science, Desalination

• **Educational activities**

Courses taught (Currently being taught)

10/2008 – Now (Fall Semester), Albert Katz International Studies, BGU: *Microbial biofilms in water and wastewater treatment processes* (graduate level)

10/2008 – 7/2018 (Spring Semester), Albert Katz International Studies, BGU: *Physiology of bacterial biofilms* (graduate level)

10/2011 – Now (Fall Semester), Biotechnology Department, BGU: *Laboratory of Unit Operation in Biotechnology* (undergraduate level)

10/2012 – 7/2016 (Spring Semester): Albert Katz International Studies, BGU: *Unit Operations in Water and Wastewater Treatment* (graduate level)

10/2016 – Now (Spring Semester): Albert Katz International Studies, BGU: *Biological processes in wastewater treatment*

• **Awards, Citations, Honors, Fellowships**

2001, The Grand Water Research Institute, Technion, Brita's award

2003, Faculty of Civil and Environmental Engineering – Technion, Eng. Y. Greenshpan's prize (for the best dissertation in the field of Environmental, Water and Agriculture Engineering for the year of 2003).

2010, Israeli laureate of the France-Israel Foundation for academic excellence in water research.

January 2022 – October 2022 Shimizu Visiting Professor, Stanford University

• Scientific Publications

H index: 38 (ISI), 42 (Google Scholar)

Total number of citations: 5900 (ISI), 6900 (Google Scholar)

Total number of citations without self-citations: 5500 (ISI), 6500 (Google Scholar)

Refereed articles and refereed letters in scientific journals (last 5 years)

67) Christopher Ziemba^{PD}, Maria Khavkin^S, Dimitris Priftis^S, Handan Acar^{PD}, Jun Mao^{PD}, Maya Benami^{PD}, Moshe Gottlieb^C, Matthew V Tirrell^C, Yair Kaufman^{C*}, **Moshe Herzberg^{PI*} (2019) Antifouling Properties of a Self-Assembling Glutamic Acid-Lysine Zwitterionic Polymer Surface Coating. *Langmuir* **35 (5)**: 1699–1713 (4 citations; IF 3.68; 76/293; Q2)

68) Inbar LeviRam^S, Amit Gross^C, David McCarthy^C, **Moshe Herzberg^{PI*} (2019) Real-time analysis of atrazine biodegradation and sessile bacterial growth: A quartz crystal microbalance with dissipation monitoring study. *Chemosphere* **225**: 871-879 (1 citation; IF 5.1; 32/251; Q1)

69) Noam Harlev^S, Anne Bogler^S, Ori Lahav^C, **Moshe Herzberg^{PI*} (2019) Acidification and decarbonization in seawater: Potential pretreatment steps for biofouling control in SWRO membranes. *Desalination* **467**: 86-94 (0 citations; IF 6.03; 10/138; Q1)

70) Noya Ran^S, Jack Gilron^C, Revital Sharon-Gojman^C, **Moshe Herzberg^{PI*} (2019) Powdered Activated Carbon Exacerbates Fouling in MBR Treating Olive Mill Wastewater *Water* **11(12)**: 2498 (0 citations; IF 2.52; 29/91; Q2)

71) Anthony P Straub^C, Eli Asa^S, Wei Zhang^S, Thanh H Nguyen^C, **Moshe Herzberg^{PI*} (2020) In-situ graft-polymerization modification of commercial ultrafiltration membranes for long-term fouling resistance in a pilot-scale membrane bioreactor. *Chemical Engineering Journal* **382**: 122865 (6 citations; IF 8.35; 6/138; Q1)

72) **Moshe Herzberg^{PI*}, Soumya Pandit^{PD}, Meagan S Mauter^C, Yoram Oren^C (2020) Bacterial biofilm formation on ion exchange membranes. *Journal of Membrane Science* 596: 117564 (4 citations; IF 7.02; 8/138; Q1)

** 73) Yang Yang^S, Anne Bogler^S, Zeev Ronen^C, Gideon Oron^C, **Moshe Herzberg**^C, Roy Bernstein^{PI*} (2020) Initial Deposition and Pioneering Colonization on Polymeric Membranes of Anaerobes Isolated from an Anaerobic Membrane Bioreactor (AnMBR), *Environmental Science & Technology* 54 (9): 5832-5842 (4 citations; IF 7.15; 14/251; Q1)

** 74) Giora J Kidron^{PI}, Ying Wang^{PD}, **Moshe Herzberg**^{PI} (2020) Exopolysaccharides may increase biocrust rigidity and induce runoff generation, *Journal of Hydrology* 588: 125081 (1 citations; IF 4.4; 6/132; Q1)

** 75) Yang-Hui Cai^S, Nir Galili^S, Y. Gelman^{CI}, **Moshe Herzberg**^{PI*}, Jack Gilron^{PI*} (2021) Evaluating the impact of Pretreatment Processes on Fouling of Reverse Osmosis Membrane by Secondary Wastewater, *Journal of Membrane Science* 623: 119054 (1 citations; IF 7.02; 8/138; Q1)

** 76) **Moshe Herzberg**^{PI}, Mattias Berglin^{CI}, Sarai Eliahu^S, Lovisa Bodin^{CI}, Karin Agrenius^{CI}, Amir Zlotkin^{CI}, Johan Svenson^{*PI} (2021) Efficient Prevention of Marine Biofilm Formation Employing a Surface-Grafted Repellent Marine Peptide, *ACS Applied Bio Materials* 4: 3360–3373 (0 citations; New Journal)

** 77) Nadine Siebdrath^{PD}, Bertram Skibinski^{PD}, Shiju Abraham^S, Roy Bernstein^{CI}, Robert Berger^S, Noa Stein^S, Yair Kaufman^S, André Lerch^{CI}, **Moshe Herzberg**^{*PI} (2021) Impact of pretreatment on RO membrane organic fouling: composition and adhesion of tertiary wastewater effluent organic matter *Environmental Science-Water Research & Technology* 7:775-788 (0 citations; IF 4.20; 7/91; Q1)

78) Inbar LeviRam, Amit Gross, Anna Lintern, Rebekah Henry, Christelle Schang, **Moshe Herzberg**, David McCarthy* (2022) Sustainable micropollutant bioremediation via stormwater biofiltration system *Water Research*, 214, 118188

79) Lili Lin, Zhiwei Li, Bo Zhang, Qianqian Zhang, Dongru Qiu, **Moshe Herzberg**, Zhenbin Wu, Enrong Xiao* (2022) Degradation and utilization of EPS from excessive activated sludge by interaction of electrogenesis and light stimulation *Journal of Environmental Chemical Engineering* 10, 107557

80) Yang Yang, Edo Bar-Zeev, Gideon Oron, **Moshe Herzberg**, Roy Bernstein* (2022) Biofilm Formation and Biofouling Development on Different Ultrafiltration Membranes by

Natural Anaerobes from an Anaerobic Membrane Bioreactor *Environmental Science and Technology* 56, 10339–10348

81) Ashraf Al-Ashhab, Amer Sweity, Luna Al-Hadidi, **Moshe Herzberg***, Zeev Ronen (2022) Antiscalants Used in Seawater Desalination: Biodegradability and Effects on Microbial Diversity *Microorganisms*, 10, 1580

82) Noya Ran, Revital Sharon-Gojman, Sara Larsson, Osnat Gillor, Meagan S. Mauter, and **Moshe Herzberg*** (2022) Unraveling pH Effects on Ultrafiltration Membrane Fouling by Extracellular Polymeric Substances: Adsorption and Conformation Analyzed with Localized Surface Plasmon Resonance *Environmental Science and Technology*, 56, 14763–14773

83) Ji Qin, Eric Ziemann, Edo Bar-Zeev, Sharon E. Bone, Yuanzhe Liang, Meagan S. Mauter, **Moshe Herzberg***, Roy Bernstein* (2023) Microporous Polyethersulfone Membranes Grafted with Zwitterionic Polymer Brushes Showing Microfiltration Permeance and Ultrafiltration Bacteriophage Removal *ACS Applied Materials and Interfaces*, 15, 18343–18353

84) Noya Ran, Gil Sorek, Noa Stein, Revital Sharon-Gojman, **Moshe Herzberg^{1*}**, Osnat Gillor* (2023) Multispecies biofilms on reverse osmosis membrane dictate the function of the bacterial communities rather than their structure. *Environmental Research* <https://doi.org/10.1016/j.envres.2023.115999>

85) Noa Stein, Revital Sharon-Gojman, Meagan S. Mauter, Roy Bernstein*, **Moshe Herzberg*** (2023) Fouling of reverse osmosis membrane with effluent organic matter: Componential role of hydrophobicity *ES&T WATER* , **In Press**

86) Inbar LeviRam, Amit Gross, Anna Lintern, Olabiyi Obayomi, Vered Chalifa-Caspi, Osnat Gillor, Rebekah Henry, Christelle Schang, **Moshe Herzberg**, David T. McCarthy* (2023) Engineering a biofilters microbiome with activated carbon and bioaugmentation to improve stormwater micropollutant removal, *Environmental Technology & Innovation*, **32**: 103338

87) Noya Ran, Talia Gabay, Eva Petrova, Roy Angel, Moshe Herzberg*, Osnat Gillor* (2024) Development, growth, and function of biofilm communities on reverse osmosis membranes desalinating tertiary effluent *Desalination* **582**: 117658

88) CL Borsky, Y Yechezkel, NMK Rogers, N Ran, M Herzberg, I Zucker* (2024) Nanobubble Transport in Porous Media: Towards Agro-and Environmental Applications *Chemosphere*, 142451

89) Daa AbuKhadra, Amit Dan Grossman, Ashraf Al-Ashhab, Ibrahim Sharabati, Roy Bernstein*, Moshe Herzberg* (2024) The Effect of Temperature on Fouling in Anaerobic Membrane Bioreactor: SMP-and EPS-Membrane Interactions, *Water Research*, 121867

** Papers published since last promotion; * Corresponding author; ^{PI} Principal investigator; ^S Student; ^{PD} Post-doctoral fellow; ^C Co-researcher; ^T Technician; [^] equal contribution

• **Lectures and Presentations at Meetings and Invited Seminars not Followed by Published Proceedings**

• **Research Grants (last 5 years)**

2020-2025 **USAID MERC**: " Developing low-fouling composite membranes for anaerobic membrane bioreactors (AnMBRs)" Partners: Roy Bernstein (BGU), Dr. Luna Al-Hadidi (National Agricultural Research Center – NARC, Baqa, Jordan) \$623,300.

2020-2022 **Israel Water Authority**: "Real-time monitoring of microbial consortia bioactivity towards micro-pollutants in wastewater treatment plants" In collaboration with Prof. Osnat Gillor (BGU). 346,000 NIS.

2020-2023 **Bi-national Agricultural Research and Development (BARD)**: "Integrating water treatment with nutrient utilization in intensive aquaculture by a new microaerophilic membrane assimilation reactor system" Partners: Dr. Edo Bar-Zeev (BGU - PI), Prof. Dina Zilberg (BGU - CI), Prof. F. Perreault (Arizona St.U. - PI) \$307,000

2020-2025 U.S.-Israel Binational Industrial Research and Development (BIRD) Foundation (U.S.-Israel Energy Center program): "**Israel-US Collaborative Water-Energy Research Center (Israel-US CoWERC)**" Co-Director with Prof. Aaron Packman (Northwestern U.) Partners: Northwestern U., Yale U., Technion, Argonne National Laboratory, Mekorot, Fluence Corporation, Galilee Society, DuPont Water Solutions, Evoqua Water Technologies LLC, Metropolitan Water Reclamation District of Greater Chicago, CycloPure, Inc., Current Innovation NFP. **18.4 M USD**

2022-2027 **Israel Science Foundation (ISF – 3rd time)**: "Interactions of microbial biofilm and its components with charged surfaces in water treatment electrochemically

driven processes”, with Prof. Yoram Oren (BGU) 300,000 NIS per year (4 years project).

2024-2026 Israel Innovation Authority (Kamin program): “Next-generation online sensing of the pretreatment and RO membrane cleaning efficiency in seawater desalination process based on nano-plasmonic sensing” 400,000 NIS per year (2 years project)

2024-2027 Israel Water Authority: “Identification of the type and degree of the fouling during seawater desalination by a sensor based on nano-plasmonic sensing technology” with Prof. Roy Berstein (BGU, co-PI) 100,000\$ for the entire grant period.