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Professional Profile

Brielle Januszewski holds degrees in environmental engineering and specializes in drinking water treatment, membrane technology, and ion separations. She has extensive laboratory experience, with expertise ranging from water chemistry to analytical chemistry techniques to laboratory experimentation.

Ms. Januszewski's graduate research focused on high water recovery reverse osmosis (RO) desalination of brackish water via valent selective electrodialysis (ED) pre-treatment. The goal of her work was to treat brackish water reserves for use as inland community drinking water sources with lower energy and chemical demand and cost than traditional treatment trains. Specifically, she designed, characterized, and investigated valent selective cation exchange membranes (vsCEMs) for use in an ED pre-treatment step to an RO module that separates monovalent ions from scale-forming divalent cations (like magnesium and calcium) to minimize inorganic scaling on the RO membrane surface for improved water recovery and reduced need for process downtime and cleaning.

Ms. Januszewski's expertise in other water treatment-focused projects includes conducting a life cycle assessment (LCA) to determine whether waterless textile dyeing via supercritical carbon dioxide is less water intensive than traditional dyeing, and investigating a novel titanium oxide catalyst for ammonia reduction to nitrogen gas in blackwater in a self-contained toilet system through the Bill and Melinda Gates Reinvent the Toilet Challenge. Further, she investigated the toxicity of nanoparticles, such as graphene oxide, silver, and cadmium, on aquatic microorganisms, like algae and bacteria, as part of a greater effort to impregnate water treatment membranes with nanoparticles to reduce biofilm formation. Finally, she has experience in ozone-treating heavy hydrocarbon contaminated soil and conducting subsequent soil bioremediation and plant toxicology studies.

Academic Credentials & Professional Honors

M.S., Chemical and Environmental Engineering, Yale University, 2023

B.A., Political Science, Arizona State University, 2020

B.S., Biological Sciences, Arizona State University, 2020

B.S.E., Civil Engineering, Arizona State University, 2020

National Science Foundation Graduate Research Fellowship, 2020

American Membrane Technology Association/Reclamation Fellowship, 2023

Prior Experience

Graduate Researcher, Yale University, 2020-2025

Civil Engineering Intern, Kimley-Horn, 2020

Undergraduate Research Intern, Argonne National Lab, 2019

Undergraduate Research Intern, Duke University, 2018

Undergraduate Research Intern, Arizona State University, 2017-2020

Professional Affiliations

American Water Works Association

Publications

Chen, T., Delgado, A. G., Yavuz, B. M., Januszewski, B., Zuo, Y., Westerhoff, P., Krajmalnik-Brown, R., Rittmann, B. E., "Multi-cycle Ozonation + Bioremediation for Soils Containing Residual Petroleum," Environmental Engineering Science 2019 36 (12). DOI: 10.1089/ees.2019.0195

Cruces, E., Barrios, A. C., Cahue, Y. P., Januszewski, B., Gilbertson, L. M., Perreault, F., "Similar Toxicity Mechanisms Between Graphene Oxide and Oxidized Multi-Walled Carbon Nanotubes in Microcystis aeruginosa," Chemosphere 2020 265. DOI: 10.1016/j.chemosphere.2020.129137

Fan, W., Li, Y., Wang, C., Duan, Y., Huo, Y., Januszewski, B., Sun, M., Hua, M., Elimelech, M., "Enhanced Photocatalytic Water Decontamination by Micro-Nano Bubbles: Measurements and Mechanisms," Environmental Science & Technology 2021. DOI: 10.1021/acs.est.0c08787

Wang, K., Wang, X., Januszewski, B., Liu, Y., Li, D., Fu, R., Elimelech, M., Huang, X., "Tailored Design of Nanofiltration Membranes for Water Treatment Based on Synthesis-Property-Performance Relationships," Chemical Society Reviews 2021. DOI: 10.1039/D0CS01599G

Yavuz, B., Januszewski, B., Chen, T., Delgado, A., Westerhoff, P., Rittmann, B., "Using radish (Raphanus lativus L.) germination to establish a benchmark dose for the toxicity of ozonated-petroleum byproducts in soil," Chemosphere 2023. DOI: 10.1016/j.chemosphere.2022.137382

Cruces, E., Barrios, A. C., Cahue, Y. P., Januszewski, B., Sepulveda, P., Cubillos, V., Perreault, F., "Toxicity mechanisms of graphene oxide and cadmium in Microcystis aeruginosa: evaluation of photosynthetic and oxidative responses," Aquatic Toxicology 2023. https://doi.org/10.1016/j.aquatox.2023.106703

Shocron, A., Monat, L., Januszewski, B., Dykstra, J., Elimelech, M., Nir, O., "Ion Selectivity in Brackish Groundwater Desalination by Electrodialysis: Experiments and Theory," Journal of Membrane Science 2025. https://doi.org/10.1016/j.memsci.2024.123668

Presentations

Oral

Januszewski, B., DuChanois, R., Elimelech, M., "Negative Rejection in Polyelectrolyte Multilayer Nanofiltration Membranes for Selective Ion Recovery," North American Membrane Society Conference. May 2022. Phoenix, AZ.

Januszewski, B., Fan, H., Elimelech, M., "Monovalent Selective Cation Exchange Membranes for

Brackish Water Desalination by Electrodialysis," Materials Research Society Conference. November 2023. Boston, MA.

Januszewski, B., Shocron, A., Fan, H., Elimelech, M., "Monovalent Selective Cation Exchange Membranes for Brackish Water Desalination by Electrodialysis," Membrane Technology Conference. February 2025. Long Beach, CA.

Poster

Januszewski, B., DuChanois, R., Wang, L., Elimelech, M., "Negative Rejection in Polyelectrolyte Multilayer Nanofiltration Membranes for Selective Ion Recovery," Nanotechnology-Enabled Water Treatment Annual Meeting. December 2021. Houston, TX.

Januszewski, B., DuChanois, R., Wang, L., Elimelech, M., "Negative Rejection in Polyelectrolyte Multilayer Nanofiltration Membranes for Selective Ion Recovery," North American Membrane Society Conference. August 2021. Estes Park, CO.

Januszewski, B., Shocron, A., Fan, H., Elimelech, M., "Monovalent Selective Cation Exchange Membranes for Brackish Water Desalination by Electrodialysis," Gordon Research Conference – Membranes: Materials and Processes. August 2024. New London, New Hampshire.