



Exponent[®]
Engineering & Scientific Consulting

Margaret L. Fleming, Ph.D.

Senior Associate | Ecological & Biological Sciences
1 Mill and Main Place, Suite 150 | Maynard, MA 01754
(978) 461-4634 tel | mfleming@exponent.com

Professional Profile

Dr. Fleming applies her training in water quality engineering to assess the ecological risk posed by emerging contaminants. Through a combination of literature and database review and modeling, she has experience synthesizing information regarding the impact of pharmaceuticals, personal care products, and other environmental issues. She has prepared written reports that integrate relevant compound characteristics associated with biodegradability, bioaccumulation, and ecological toxicity for use in environmental risk assessments in accordance with U.S. and EU regulations. Her risk assessment experience extends to experimental design and data analysis as applied in her research characterizing the metal oxide nanoparticles used in the semi-conductor industry. Her work determining nanoparticle properties including charge, size, and aggregation rate was used to predict behaviors and interactions with biological cells in aquatic environments.

In addition to her work assessing the environmental impact of engineered nanoparticles, Dr. Fleming has also explored potential applications of these particles. Her research involved the evaluation of low-pressure water filtration membranes modified with antibacterial silver nanoparticles. The ability of this modification to decrease bacterial growth and increase energy efficiency was tested in bench-scale laboratory studies.

Academic Credentials & Professional Honors

Ph.D., Geography & Environmental Engineering, Johns Hopkins University, 2020

M.S.E., Environmental Process Engineering, Johns Hopkins University, 2018

B.S., Environmental Engineering, Cornell University, 2014

American Chemical Society Graduate Student Award (2016)

Integrative Graduate Education and Research Traineeship (IGERT) Water, Climate, and Health Fellow

Prior Experience

Technical Associate, EcoSafety Sciences, 2014-2019

Publications

Fleming M, Bouwer E, Chen KL. Biofouling response of laboratory-scale polysulfone membranes modified with bioinspired polydopamine and silver nanoparticles. *Environmental Engineering Science*

2019; 36:335-343.

Tang L, Huynh KA, Fleming M, Larronde-Larretche M, Chen KL. Imparting antimicrobial and antiadhesive properties to polysulfone membranes through modification with silver nanoparticles and polyelectrolyte multilayers. *Journal of Colloid and Interface Science* 2015; 451:125–133.

Buchanan BP, Fleming M, Schneider RL, Richards BK, Archibald J, Qiu Z, Walter MT. Evaluating topographic wetness indices across central New York agricultural landscapes. *Hydrology and Earth System Sciences* 2014; 18:3279-3299.

Presentations

Fleming M, Bouwer E. Interactions of chemical mechanical planarization nanoparticles and synthetic cell membranes. Poster presentation, Association of Environmental Engineering and Science Professors Education and Research Conference, Tempe, AZ, 2019.

Fleming M, Bouwer E, Chen KL. Modifying water purification membranes with bioinspired polydopamine and silver nanoparticles for biofilm prevention. Oral presentation, 4th Annual International Institute for Environmental Studies Science and Policy Workshop, Edinburgh, Scotland, 2018.

Fleming M, Bouwer E, Chen KL. Effects of modifying low pressure membranes with bioinspired polydopamine and silver nanoparticles on biofilm formation. Oral presentation, 254th American Chemical Society National Meeting & Exposition, Washington, DC, 2017.

Fleming M, Chen KL. Polymeric membranes modified with bioinspired polydopamine and silver nanoparticles for water purification applications. Oral presentation, 252nd American Chemical Society National Meeting & Exposition, Philadelphia, PA, 2016.