

HARNESSING MICROORGANISMS WITH INNOVATIVE MATERIALS FOR WATER, FOOD, ENERGY, AND HEALTH

Speaker

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Abstract

Microorganisms in the environment play an important role in human lives: microbial metabolism can be used to treat our waste and generate useful products (e.g., food, medicine, and energy), while pathogenic microorganisms in our water and food can threaten human health. Developments of innovative materials help us to better harness microbial activities for human needs. In this presentation, I would like to talk about two examples about applying innovative materials for inactivation and detection of microorganisms, respectively. First, I will introduce a chemical-free microbial inactivation approach named locally enhanced electric field treatment (LEEFT), which is an electrophysical method that relies on nanowire-enabled low-voltage electroporation to kill bacteria. Second, I will talk about 3D filtration processes based on superabsorbent polymer (SAP) beads, which have been successfully applied to concentrate and preserve water samples for microbial quantification.

Biography

Dr. Xing Xie is a Carlton S. Wilder Associate Professor and the Environmental Engineering Group Leader in the School of Civil and Environmental Engineering at Georgia Institute of Technology. Prior to joining Georgia Tech, he was a postdoc at Caltech. Dr. Xie received his B.S. and M.S. degrees in Environmental Science & Engineering from Tsinghua. He received his second M.S. degree in Materials Science & Engineering and Ph.D. degree in Civil & Environmental Engineering from Stanford. Dr. Xie's research interests center around the applications of environmental biotechnology and materials science at the nexus of water, food, energy, and health. He has worked on many projects related to water treatment and reuse, pollutant detection and quantification, and energy and resource recovery. He has published more than 90 peer-reviewed articles, and his work has been cited over 11,000 times with an H-index of 45. Dr. Xie has received multiple awards and recognitions, including CAREER Award from National Science Foundation, Emerging Investigator Award from Sustainable Nanotechnology Organization, Excellence in Environmental Engineering and Science Honor Award from the American Academy of Environmental Engineers & Scientists, and Walter L. Huber Research Prizes from American Society of Civil Engineers. Dr. Xie is a licensed Professional Engineer in Georgia.



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