Lundi 20 juin 2016 – 11h20 : **Virus removal in membrane bioreactors: Mechanisms and Implications**

Vlad Tarabara, Associate Professor

Michigan State University

**Abstract**

Virus removal in membrane bioreactors (MBRs) is of concern since membrane pore size can be larger than the size of certain viruses. I will describe our recent work on the removal of human adenovirus 40 (HAdV 40) by ultra- and microfiltration membranes commonly used in full scale MBRs. The central hypothesis is that virus removal is governed by virus interactions with suspended and attached biomass in the MBR. In particular, we seek to understand the role of the biofilm on the membrane surface in virus removal. To test the hypothesis, we measured virus removal by fouled membranes at different stages of fouling layer development. Results on HAdV 40 removal from model feeds are interpreted in terms of individual and combined impacts of dissolved and particulate foulants on virus removal by membranes of different pore sizes. I will then overview experiments with a lab-scale MBR inoculated with municipal wastewater and discuss the roles of membrane fouling and cleaning procedures - periodical pressure relaxation and membrane backwash – in removing HAdV40.

**Bio**

Vlad Tarabara is an Associate Professor of Environmental Engineering at Michigan State University. He joined MSU in 2004 after completing his doctoral studies in Environmental Engineering at Rice University. Dr. Tarabara’s research is in the area of membrane separations with a focus on membrane materials and process design. Current projects are on catalytic membrane reactors, virus removal by porous membranes, and microfiltration of emulsions with funding support from NSF and EPA. Dr. Tarabara is a recipient of several research awards including 2011 Paul L. Busch Award from WERF and 2014 Fulbright U.S. Scholar award. He currently serves as an Associate Editor of the ASCE Journal of Environmental Engineering and is a co-Editor-in-Chief of the Encyclopedia of Membrane Science and Technology published by John Wiley & Sons.