

PROMOTION RECOMMENDATION  
The University of Michigan  
College of Engineering  
Department of Civil and Environmental Engineering

Krista R. Wigginton, assistant professor of civil and environmental engineering, Department of Civil and Environmental Engineering, College of Engineering, is recommended for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, College of Engineering.

Academic Degrees:

- Ph.D. 2008 Virginia Polytechnic Institute and State University, Environmental Engineering, Blacksburg, VA  
M.S. 2004 Virginia Polytechnic Institute and State University, Environmental Engineering, Blacksburg, VA  
B.S. 2001 University of Idaho, Chemistry, Moscow

Professional Record:

- 2013 – Present Assistant Professor, Department of Civil and Environmental Engineering, University of Michigan  
2013 – 2016 Borchardt and Glysson Water Treatment Scholar, Department of Civil and Environmental Engineering, University of Michigan  
2011 – 2012 Pedro E. Wasmer Assistant Professor of Environmental Engineering, Department of Civil and Environmental Engineering, University of Maryland, College Park  
2008 – 2010 Post-doctoral Researcher, School of Architecture, Civil and Environmental Engineering, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland

Summary of Evaluation:

Teaching: Professor Wigginton has taught three different courses at the University of Michigan in addition to coordinating the environmental engineering seminar. She introduced a new course (CEE597 Environmental Organic Chemistry), which is a relatively unique offering for an environmental engineering program. She has received outstanding Q1 and Q2 teaching scores for this course ranging from mid- to high-4. Student letters uniformly referred positively to Professor Wigginton's approachability, willingness to "go the extra mile," dedication to student well-being, and her focus on student success.

Professor Wigginton has served as the advisor to two Ph.D. students (both graduated Fall 2018) and co-advisor of six additional Ph.D. students (one of whom graduated in 2018). She has also advised and co-advised 10 M.S. students and 10 undergraduate students engaged in research. She promotes scientific excellence in all her students, which has led to an established record of success for them. Several of her undergraduate advisees are pursuing Ph.D. degrees at other universities such as Stanford and Virginia Tech, and all her Master's level advisees are pursuing

PhDs. Among her Ph.D. graduates, one is now a AAAS Fellow at the Department of Energy and another has a post-doctoral position at Pacific Northwest National Laboratory. Furthermore, her two post-doctoral advisees are currently in tenure-track faculty positions at Michigan State and Stanford.

Research: Professor Wigginton's research approach tends to be multidisciplinary and is focused at the intersection of virology, biochemistry, environmental engineering and public health. She is recognized as an international authority on developing novel methods and using those methods to understand the fate of environmental pollutants, especially disease causing enveloped viruses. She asks very practical questions to which she applies very fundamental methods; for example, in asking about the risk enveloped viruses impose on public health through water, she develops novel methods to determine how they partition, react and change their infectivity (and, therefore, risk) once in the environment. Her letter writers uniformly consider her work to be of the highest quality and her scholarship to be excellent. Her work has been recognized by a number of highly prestigious awards including the National Science Foundation (NSF) CAREER Award and the Paul L. Busch Award from the Water Research Foundation (one annual \$100,000 award nationally). She has also been invited by the National Academy of Engineering to co-organize a session at the Japan-America Frontiers of Engineering Program, an honor reserved for those considered by the academy to be thought leaders working at the forefront of the field.

Professor Wigginton's publication record is excellent and her papers appear in top tier journals. She has a total of 27 journal papers published or in press, many of which are co-authored with her students (seven of these papers are with her students as first author). She has also written two refereed conference papers and over 40 refereed conference abstracts. Her funding is equally impressive; she has secured 11 external research grants (four of which she serves as the principal investigator) with her share totaling more than \$2.6 million.

#### Recent and Significant Publications:

- Qiao, Z., Ye, Y., Chang, P.H., Thirunarayanan, D., Wigginton, K.R. "Nucleic Acid Photolysis by UV254 and the Impact of Virus Encapsidation," *Environmental Science & Technology*, 2018; 52(18): 10408-10415.
- Goetsch, H.E., Zhao, L., Gnegy, M., Imperiale, M.J., Love, N.G., Wigginton, K.R. "Fate of the Urinary Tract Virus BK Human Polyomavirus in Source-Separated Urine," *Applied and Environmental Microbiology*, 2018; 84(7): 13061-13069.
- Ye, Y., Chang, P.H., Hartert, J., Wigginton, K.R. "Reactivity of Enveloped Virus Genome, Proteins, and Lipids with Free Chlorine and UV254," *Environmental Science & Technology*, 2018; 52(14): 7698-7708.
- Qiao, Z, Wigginton, K. "Direct and Indirect Photochemical Reactions in Viral RNA Measured with RT-qPCR and Mass Spectrometry," *Environmental Science & Technology*, 2016; 50: 13371-13379.
- Ye, Y., Ellenberg, M., Graham, K., Wigginton K. "Survivability, Partitioning, and Recovery of Enveloped Viruses in Untreated Municipal Wastewater," *Environmental Science & Technology*, 2016; 50: 5077-5085.

Wigginton, K, Ye, Y., Ellenberg, M. “Emerging Investigators Series: The Source and Fate of Pandemic Viruses in the Urban Water Cycle,” *Environmental Science: Water Science and Technology*, 2015; 1: 735-746.

Service: Within the department, Professor Wigginton has served on a wide array of committees including the Facilities and Research, Masters, and Graduate Student Committees. Furthermore, she has served on two departmental faculty search committees along with the college’s CEE Chair Search Committee, and currently serves on the CEE Strategic Planning Committee. External to the university, Professor Wigginton also has strong service record. She is on the editorial board of *Chemosphere* and recently was invited to serve as an associate editor of *Environmental Science: Water Research and Technology*, a relatively new but already well respected journal in the field. She has also been active in national professional organizations including the Association of Environmental Engineering and Science Professors (AEESP), the American Water Works Association (AWWA) and the American Chemical Society (ACS). In the latter, she has been especially active in organizing sessions at the ACS Annual Meetings.

External Reviewers:

Reviewer A: “What helps to distinguish Dr. Wigginton’s work from others in her field is her impeccable, interdisciplinary training, drawing upon techniques in chemistry, virology, engineering and advanced bio/chemical analytical methods.”

Reviewer B: “She has published high quality papers in highly reputed journals (e.g., *Environmental Science & Technology (ES&T)*, the premier journal in our field, and *Applied and Environmental Microbiology*). These journals are known for their high standards and very rigorous review process.”

Reviewer C: “I have reviewed dozens of resumes for promotion and tenure of faculty over my career and I have to state this is the most impressive I have ever seen in my career.”

Reviewer D: “Professor Wigginton has worked in a difficult area – of understanding the factors and mechanisms leading to inactivation of viruses that may occur (and be transmitted via) water. Included in these are the enveloped viruses, which have not garnered a lot of attention due to experimental hurdles... but she, with colleagues, have [sic] overcome these and applied state of the art methods leading to greater understanding.”

Reviewer E: “The list of Paul L. Busch award winners reads like a who’s who of environmental engineering. She also appears to be very successful in advising graduate students. They have received numerous awards and fellowships at levels ranging from university to national. That four of her group members have received National Science Foundation Graduate Research Fellowships is especially impressive.”

Reviewer F: “Her service as an associate editor for *Environmental Science: Water Research and Technology* and editorial board membership of *Chemosphere* is impressive at such a career age [of her cohort].”

Summary of Recommendation: Professor Wigginton is an outstanding faculty member who has excelled as a faculty member. She is considered among the top in her specialty area in her field, has performed admirably in the classroom, and is highly regarded and respected in her service endeavors. It is with the support of the College of Engineering Executive Committee that I recommend Krista R. Wigginton for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, College of Engineering.



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Alec D. Gallimore, Ph.D.  
Robert J. Vlastic Dean of Engineering  
College of Engineering

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