

Mehlika Ayla Kiser

Research Scientist

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ResearcherID: E-3138-2014

SUMMARY

I am a research scientist in environmental engineering and biomimicry. During my Ph.D. program, I investigated the fate of engineered nanomaterials in wastewater treatment plants. After earning my Ph.D., I was a postdoctoral researcher in a chemistry department, studying the hydrophobicity of functionalized gold nanoparticles. After moving to Spain, I became a postdoctoral researcher at the Catalan Institute for Water Research for the R3Water project and built integrated models of wastewater treatment plants that can be used to reduce the plants' consumption of energy while maintaining performance. I am currently a research assistant at Arizona State University's Biomimicry Center, researching biomimetic manufacturing. In August 2015, I began training to become a biomimicry professional, as my long-term goal is to do research, consult, write, teach, and otherwise contribute to the field of biomimicry.

EDUCATION

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|---------------------|---|
| Aug. 2015 - Present | M.S., Biomimicry , <i>Arizona State University</i>
Biomimicry Professional Certificate , <i>Biomimicry 3.8: Biomimicry Professional Program</i>
Degree and certificate expected in May 2018 |
| Dec. 2011 | Ph.D., Environmental Engineering , <i>Arizona State University</i>
Dissertation: "Fate of Engineered Nanomaterials in Wastewater Treatment Plants"
Committee: Paul Westerhoff, Chair; Bruce Rittmann, Co-Chair; Kiril Hristovski |
| May 2006 | M.S., Environmental Engineering , <i>University of Nevada, Las Vegas</i>
Focus: Water and wastewater treatment |
| May 2003 | B.S., Mechanical Engineering , <i>University of Nevada, Las Vegas</i>
Graduated <i>cum laude</i> with University Honors
Focus: Environmental systems |

RESEARCH

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|-----------------|---|
| 09/15 - Present | Graduate Research Assistant , The Biomimicry Center, <i>Arizona State University</i>
Supervisors: Prof. Prasad Boradkar, Dr. Dayna Baumeister
Research Topics: Biomimicry for manufacturing; Life's Principles |
| 06/14 – 04/17 | Postdoctoral Researcher , Technologies and Evaluation Department,
<i>Institut Català de Recerca de l'Aigua (ICRA) - Catalan Institute for Water Research</i>
Supervisors: Dr. Lluís Corominas, Dr. Ignasi Rodríguez-Roda |

Project: Reuse of water, Recovery of valuables, and Resource efficiency in urban wastewater treatment (R3Water)

Funded by: European Union Framework Programme 7 (EU FP7)

- 05/12 - 05/13 **Postdoctoral Researcher**, Department of Chemistry, *University of Oregon*
 Supervisor: Dr. James Hutchison
 Project: Designing Greener Nanomaterials
 Funded by: Safer Nanomaterials and Nanomanufacturing Initiative (SNNI)
- 08/06 - 12/11 **Graduate Research Assistant**, Sustainable Engineering and the Built Environment, *Arizona State University*
 Supervisors: Dr. Paul Westerhoff, Bruce Rittmann
 Project: Fate and Imaging of Nanomaterials During Biological Treatment in Wastewater Treatment Plants
 Funded by: United States Environmental Protection Agency (USEPA)
- 01/05 - 12/05 **Graduate Research Assistant**, Department of Civil and Environmental Engineering, *University of Nevada, Las Vegas*
 Supervisors: Dr. David James, Harold R. Hay
 Project: Improving the Efficiency of Solar Water Distillation
 Funded by: Harold R. Hay

TEACHING

- Summer 2011 **Lecturer**, CEE 361: Introduction to Environmental Engineering
 Sustainable Engineering and the Built Environment, *Arizona State University*
 60 hours of lecture, 15 hours of laboratory
 Evaluation: Of the students that submitted an evaluation, 67% rated the course and instructor as "Excellent," and 33% as "Very Good"
- Spring 2009 **Teaching Assistant**, CEE 361: Introduction to Environmental Engineering
 Sustainable Engineering and the Built Environment, *Arizona State University*
 2 hours of lecture (as guest lecturer), 15 hours of laboratory
- 10/03 - 06/04 **Teacher**, English for grades 2 through 5 (Pau, France)
French Government Teaching Assistant Program

STUDENT RESEARCH SUPERVISION

- 04/16 – 9/16 **Supervisor**, Technologies and Evaluation Dept., *Catalan Institute for Water Research*
 Student: Roger Sagristà Jubany, BS student
 Program: Grau en Química, Facultat de Ciències, Universitat de Girona
 Final Project: "Investigating the Fate of Titanium Dioxide Nanoparticles in Wastewater Treatment Plants"
- 05/15 – 09/15 **Supervisor**, Technologies and Evaluation Dept., *Catalan Institute for Water Research*
 Student: Lluís Godo, MS student (Graduated 09/2015)
 Program: Màster en Ciència i Tecnologia de l'Aigua, Universitat de Girona
 MS Thesis: "Investigating the Fate of Titanium Dioxide Nanoparticles from Sunscreens in Wastewater and Activated Sludge"
- 10/14 – 05/15 **Supervisor**, Technologies and Evaluation Dept., *Catalan Institute for Water Research*
 Student: Cristina Pita, MS student (Graduated 05/2015)

Program: Màster en Ciència i Tecnologia de l'Aigua, Universitat de Girona
 MS Thesis: "Improving Tracer Test Methodology for Assessing the Mixing Efficiency of Anaerobic Digesters"

- Summer 2012 **Mentor**, Department of Chemistry, *University of Oregon*
 Student: Leslie Kraynak, Undergraduate student
 Program: National Science Foundation Research Experience for Undergraduates
- Summer 2010 **Mentor**, Sustainable Engineering and the Built Environment, *Arizona State University*
 Student: Romain Orhand, Undergraduate student
 Program: Guest researcher in Dr. Paul Westerhoff's laboratory
- Summer 2009 **Mentor**, Sustainable Engineering and the Built Environment, *Arizona State University*
 Student: Jonathan Pérez-Rivera, Undergraduate student
 Program: Guest researcher in Dr. Paul Westerhoff's laboratory

SCIENCE COMMUNICATION

- 11/13 – 03/15 **Contributing Editor**, *InterNano* (www.internano.org)
- 03/14 – 05/14 **Communications Officer**, Marketing and Communications Department
Catalan Institute of Nanoscience and Nanotechnology, Bellaterra, Spain

INDUSTRY EXPERIENCE

- 2005 – 2006 **Intern**, Environmental Engineering, *Carollo Engineers*, Las Vegas, Nevada, USA
- 2000 - 2003 **Intern**, Mechanical Engineering, *UNLV Solar Site*, Las Vegas, Nevada, USA
- 1999 – 2000 **Intern**, Mechanical Engineering, *Ethel M Chocolates*, Henderson, Nevada, USA

PEER-REVIEWED PUBLICATIONS (Cited 1115 times as of 23 May 2017, Google Scholar)

1. Montserrat, A.; Bosch, L.M.; **Kiser, M.A.**; Poch, M.; Corominas, L. Using data from monitoring combined sewer overflows to assess, improve, and maintain combined sewer systems. *Sci. Total Environ.* **2015**, *505*, 1053-1061.
2. Westerhoff, P.K.; **Kiser, M.A.**; Hristovski, K. Nanomaterial removal and transformation during biological wastewater treatment. *Env. Eng. Sci.* **2013**, *30* (3), 109-117.
3. **Kiser, M.A.**; Ladner, D.A.; Hristovski, K.D.; Westerhoff, P.K. Nanomaterial transformation and association with fresh and freeze-dried wastewater activated sludge: Implications for testing protocol and environmental fate. *Env. Sci. & Tech.* **2012**, *46* (13), 7046-7053.
4. Westerhoff, P.K.; Song, G.X.; Hristovski, K.; **Kiser, M.A.** Occurrence and removal of titanium dioxide at full scale wastewater treatment plants: Implications for TiO₂ nanomaterials. *J. Env. Monit.* **2011**, *13* (5), 1195-1203.

5. **Kiser, M.A.**; Ryu, J.; Jang, H.; Hristovski, K.; Westerhoff, P.K. Biosorption of nanoparticles to heterotrophic wastewater biomass. *Wat. Res.* **2010**, 44 (14), 4105-4114.
6. **Kiser, M.A.**; Oppenheimer, J.; DeCarolis, J.; Hirani, Z.M.; Rittmann, B.E. Quantitatively understanding the performance of membrane bioreactors. *Sep. Sci. & Tech.* **2010**, 45 (7), 1003-1013.
7. **Kiser, M.A.**; Westerhoff, P.; Benn, T.; Wang, Y.; Perez-Rivera, J.; Hristovski, K. Titanium nanomaterial removal and release from wastewater treatment plants. *Env. Sci. & Tech.* **2009**, 43 (17), 6757-6763.

ORAL PRESENTATIONS

1. **Kiser, M.A.**; Boradkar, P.; Baumeister, D. Using biomimicry to discover, develop, and evaluate nature-based solutions. 10th International Society for Environmental Biotechnology Conference, Barcelona, Spain, 3 June **2016**.
2. **Kiser, M.A.**; Corominas, L.; Rodríguez-Roda, I. Learning from nature: biomimicry in nanotechnology education. SUN-SNO-GUIDENANO Sustainable Nanotechnology Conference, Venice, Italy, 10 March **2015**.
3. **Kiser, M.A.** NanoPredict: a model to predict the fate of nanoparticles in wastewater treatment plants. I Foro LEQUIA de transferencia tecnológica en el campo del agua (LEQUIA Forum I for technology transfer in the field of water), Girona, Spain, 12 December **2014**.
4. **Kiser, M.A.** Fate and transport of nanomaterials in wastewater treatment plants. Environmental Protection Agency Region VI and Region VI Pretreatment Association 28th Annual Pretreatment Program Workshop, Albuquerque, New Mexico, 24 July **2012**. (Invited talk)
5. **Kiser, M.A.**; Ryu, J.; Ladner, D.; Hristovski, K.; Westerhoff, P. Nanoparticle biosorption to wastewater biomass. European Association of Chemical and Molecular Sciences International Conference on Chemistry and the Environment, Zurich, Switzerland, 12 September **2011**.
6. **Kiser, M.A.**; Westerhoff, P.; Benn, T.; Wang, Y.; Ryu, H.; Hristovski, K. Potential removal and release of nanomaterials in wastewater treatment plants. World Environment Federation Technical Exhibition and Conference, New Orleans, Louisiana, 4 October **2010**.
7. **Kiser, M.A.**; Westerhoff, P.; Ryu, H.; Benn, T. Occurrence and fate of engineered nanomaterials in wastewater treatment plants. 240th American Chemical Society National Meeting and Exposition, Boston, Massachusetts, 25 August **2010**.
8. **Kiser, M.A.**; Westerhoff, P.; Benn, T.; Wang, Y.; Ryu, H. Release of nanomaterials from wastewater treatment plants. Society of Environmental Toxicology and Chemistry Europe 20th Annual Meeting, Seville, Spain, 25 May **2010**.
9. Westerhoff, P.; **Kiser, A.**; Benn, T. Detection of titanium dioxide in wastewater treatment plants (Paper COLL 62). 237th American Chemical Society National Meeting, Salt Lake City, Utah, 22 March **2009**.
10. Benn, T.; Westerhoff, P.; **Kiser, A.**; Wang, Y.; Hristovski, K. Detection of nanoscale titanium dioxide in wastewater treatment systems. 42nd Annual American Chemical Society Regional Meeting, Las Vegas, Nevada, 26 September **2008**.

11. **Kiser, M.A.;** Chen, B.Y.; Westerhoff, P. Sunlight photochemical degradation of disinfection byproducts. Arizona Water Pollution Control Association 80th Annual Conference, Mesa, Arizona, 3 May **2007**.
12. **Kiser, M.A.;** Chen, B.Y.; Westerhoff, P. Sunlight photochemical degradation of disinfection byproducts, California-Nevada Section American Water Works Association Spring Conference, Las Vegas, Nevada, 19 April **2007**.

SERVICE AND LEADERSHIP

- 2009 – Present Reviewer for Journals: *Environmental Science & Technology*, *Water Research*, *J. Environmental Monitoring*, *Bioresource Technology*, *Environmental Research*, *J. Hazardous Materials*, *Process Biochemistry*, *Environmental Engineering Science*, *J. of Environmental Chemical Engineering*
- 2007 Project Founder and Leader, Water and Sanitation in Tsuraku, Ecuador, Engineers Without Borders, Arizona State University
- 2006 Committee Liaison, Arizona Water and Pollution Control Association, and Water for People
- 2001 – 2002 Cataloging Secretary and Recording Secretary, Tau Beta Pi (engineering honors society)
- 2000 – 2001 Vice-President, Pi Mu Epsilon (mathematics honors society)

AWARDS

- 2015 – 2016 The Biomimicry Center Symbiont Scholarship, Arizona State University
- 2012 Certificate for most cited research article in *Journal of Environmental Monitoring* from the 2012 Impact Factor: Kiser et al. Occurrence and removal of titanium at full scale wastewater treatment plants: implications for TiO₂ nanomaterials. *J. Env. Monit.* 2011, 13 (5), 1195-1203.
- 2007 – 2011 Achievement Rewards for College Scientists (ARCS)
- 2010 Best Student Presentation Award in “Environmental Applications and Implications of Nanotechnology,” Division of Environmental Chemistry, 240th ACS National Meeting and Exposition, Boston, Massachusetts, August 2010
- 2006 – 2007 University Graduate Fellowship, Arizona State University
- 2006 – 2007 Fulton Signature Fellowship, Arizona State University
- 2004 Environmental Engineering Scholarship, Air & Waste Management Association, Las Vegas
- 2002 American Council of Engineering Companies of Nevada Scholarship
- 1998 – 2000 Edwin Wiegand Science and Technology Scholarship
- 1998 Rosemary Masek Award for Outstanding Work in Honors History

1997 National Merit Scholarship

MEMBERSHIPS

Sustainable Nanotechnology Organization (SNO)
International Water Association (IWA)
American Chemical Society (ACS)
American Association for the Advancement of Sciences (AAAS)
Association of Environmental Engineering and Science Professors (AEESP)
Society of Women Engineers (SWE)

INSTRUMENT AND SOFTWARE SKILLS

SIMBA#
Dynamic light scattering (DLS)
Inductively-coupled plasma optical emission spectrometry (ICP-OES)
Nuclear magnetic resonance (NMR)
Small-angle X-ray scattering (SAXS)
Transmission electron microscopy (TEM)
Ultraviolet-visible spectroscopy (UV-Vis)
Luminescence spectroscopy
AQUASIM
Fortran
LabVIEW
Matlab
OncoLogic

LANGUAGES

Fluent in oral and written English (native language)
Intermediate level of oral and written French
Intermediate level of oral and written Turkish