

## Li (Lauren) Tang

*Ph.D., E.I.T.*

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### Education

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- Johns Hopkins University (JHU), Baltimore, MD 2009 – 2015  
*Department of Geography and Environmental Engineering, Whiting School of Engineering*
  - Ph.D. Environmental Engineering May 2015  
Dissertation Title: “*Surface Modification of Polymeric Membranes with Thin Films and Silver Nanoparticles for Biofouling Mitigation*”, Advisor: Prof. Kai Loon Chen
  - M.S.E. Environmental Engineering, GPA: 3.8/4.0 May 2012
- Harbin Institute of Technology (HIT), Harbin, China 2003 - 2009  
*School of Municipal and Environmental Engineering*
  - M.S.E. Municipal Engineering, GPA: 3.6/4.0 July 2009  
Dissertation Title: “*Catalytic Ozonation by Metal Doped Nano-Sized TiO<sub>2</sub> for Degradation of Oxalate in Water*”, Advisor: Prof. Jun Ma
  - B.S.E. Water and Wastewater Engineering, GPA: 3.9/4.0 (top 2%) July 2007

### Research Experience

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- Graduate Research Assistant, JHU September 2010 – February 2015  
*Membrane Surface Modification with Polyelectrolyte Multilayers (PEMs) and AgNPs to Mitigate Biofouling*
  - Designed, assembled, operated and troubleshot a direct microscopic observation membrane filtration system to quantify bacterial deposition kinetics and reversibility on the membrane surface during water filtration, thereby enabling the fast and accurate evaluation of membranes’ bacterial anti-adhesive properties
  - Successfully modified a polysulfone membrane with poly(allyamine hydrochloride) and poly(acrylic acid) PEMs and AgNPs using the layer-by-layer adsorption technique in a facile and consistent way by employing a laboratory-made membrane surface modification cell
  - Significantly enhanced membranes’ bacterial anti-adhesive and antimicrobial properties: bacterial deposition kinetics was reduced by half and deposition reversibility was increased to ~ 100% (< 10% for unmodified membrane); bacterial colony growth on the membrane surface could be completely inhibited
  - Systematically quantified the interfacial interactions between a bacterial surrogate colloid and the membrane surface by performing AFM force measurements, and identified the highly swollen and hydrated PEM structure could contribute to the enhanced bacterial anti-adhesive properties

Li (Lauren) Tang  
Curriculum Vitae

### *Membrane Surface Modification with Bioinspired Polydopamine (PDA) and AgNPs Formed in situ to Mitigate Biofouling*

- Fabricated polysulfone membranes by phase inversion method and optimized the fabrication parameter and procedure
- Successfully developed an efficient and facile membrane surface modification method with PDA and AgNPs formed *in situ*
- Greatly enhanced membrane's bacterial anti-adhesive properties: bacterial deposition kinetics was reduced by 60%, and proved that the enhanced membranes' anti-adhesive properties were contributed to the improved hydrophilicity by PDA coating
- Imparted the membrane with strong antimicrobial properties: bacterial colony growth on the membrane surface was completely inhibited because of AgNPs formed *in situ*

Graduate Research Assistant, HIT

September 2008 - June 2009

### *Catalytic Ozonation by Mn or Co Doped Nano-sized TiO<sub>2</sub> for Degradation of Organic Pollutants in Water*

- Modified the nano-TiO<sub>2</sub> catalyst by doping with Mn or Co to enhance its catalytic ozonation efficiencies
- Designed and implemented a semi-batch ozonation system to study catalysts' heterogeneous catalytic ozonation efficiencies
- Enhanced the degradation efficiency of oxalate by ozonation to 90% (< 5% for unmodified nano-TiO<sub>2</sub> catalyst)
- Successfully immobilized the nano-TiO<sub>2</sub> catalyst on zeolite that can enhance its separation and reuse efficiencies

## **Publications**

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- Zhang, J., Ma, J., Yang Y.X., Tang, L., Catalytic Ozonation by Transition Metal Doped-TiO<sub>2</sub> for Degradation of Nitrobenzene in Water, *China Water & Wastewater*, 2015, ASAP.
- Tang, L., Livi, K.J.T., and Chen, K.L., Polysulfone Membranes Modified with Bioinspired Polydopamine and Silver Nanoparticles Formed *in situ* to Mitigate Biofouling, *Environmental Science & Technology Letters*, 2015, 2(3), 59-65.
- Tang, L., Huynh, K. A., and Chen, K.L., Imparting Antimicrobial and Antifouling Properties to Membranes through Modification with Polyelectrolyte Multilayers and Silver Nanoparticles, *Journal of Colloid and Interface Science*, 2015, 451, 125-133.
- Chen, C., Tang, L., Zhang, X., Liu B.C., Crittenden J., Chen, K.L., and Chen, Y.S., Forming Mechanism Study of Unique Pillar-like and Defect-free PVDF Ultrafiltration Membranes with High Flux, *Journal of Membrane Science*, 2015, 487, 1-11.
- Zhang, J., Yang Y.X., Ma, J., Tang, L., Performance Investigation of Catalytic Ozonation of Oxalate by CoO<sub>x</sub>-TiO<sub>2</sub>, *China Environmental Science*, 2014, 34 (6), 1457-1462.
- Tang, L., Gu, W., Yi, P., Bitter, J.L., Hong, J.Y., Fairbrother, D.H., and Chen, K.L., Bacterial Anti-Adhesive Properties of Polysulfone Membranes Modified with Polyelectrolyte Multilayers, *Journal of Membrane Science*, 2013, 446, 201-211.
- Zhang, J., Ma, J., Yang, Y.X., Tang, L., Liu, B.C., and Wang, S.J., Catalytic Ozonation of Nitrobenzene by Nanosized Rutile TiO<sub>2</sub>, *China Water & Wastewater*, 2010, 26 (7), 103-108.

## Honors and Awards

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- C. Ellen Gonter Environmental Chemistry Award, *ACS Division of Environmental Chemistry* February 2015
- Graduate Student Award in Environmental Chemistry, *ACS Division of Environmental Chemistry* January 2014
- Certificate of Merit Award, *ACS Division of Environmental Chemistry* October 2013
- Gordon Croft Fellowship, *Johns Hopkins University* 2013 - 2014
- Dean Robert H. Roy Fellowship, *Johns Hopkins University* 2009 - 2010
- Excellent M.S.E. Thesis Award, *Harbin Institute of Technology* July 2009
- Master's Student Scholarship for Municipal Engineering, *Harbin Institute of Technology* 2007-2008
- Honor of Excellent Student, *Harbin Institute of Technology* July 2006
- National Building Standard Design Scholarship, *China Institute of Building Standard Design & Research* 2005 - 2006
- Honor of Excellent Member in Student Union, *Harbin Institute of Technology* July 2004