Curriculum Vitae

Roya Gitiafroz, Ph.D.

Department of Chemical Engineering and Biomolecular Engineering
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Position

Assistant Professor of Engineering Instruction 08/2016 – present
Department of Chemical Engineering and Biomolecular Engineering, The University of Akron, Akron, OH, USA

Visiting Instructor 01/2014 – 05/2016
Department of Chemical Engineering and Biomolecular Engineering, The University of Akron, Akron, OH, USA

Education

Ph.D. 09/2006-10/2011
Department of Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, ON, Canada
Department of Environmental Engineering, University of Michigan, Ann Arbor, MI, USA

Dissertation: Microorganisms and Metabolic Pathways Involved in Anaerobic Benzene Biodegradation under Nitrate-Reducing Conditions
Advisor: Prof. E.A. Edwards (University of Toronto), Co-Advisor: Prof. L. Raskin (University of Michigan)

M.A.Sc. 09/2003-08/2005
Department of Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, ON, Canada
Dissertation: Study of Surface Tension of a Therapeutic Lung Surfactant
Advisor: Prof. A.W. Neumann

B.Sc. 09/1995-08/1999
Department of Chemical Engineering, Amirkabir University of Technology, Tehran, Iran
Dissertation: Extraction of Provitamin A from an Alga

Awards and Scholarships

- NETI-1 Teacher Scholar Tuition Fee Waiver 01/2019
- University of Toronto Fellowship 09/2006-08/2011
- University of Toronto Doctoral Completion Grant 09/2010-04/2011
- Ontario Graduate Scholarship 05/2009-05/2010

- University of Toronto Fellowship 09/2003-09/2005

Teaching Experience

Assistant professor of Instruction Engineering, Department of Chemical and Biomolecular Engineering, The University of Akron

Courses:

- Transport Phenomena 08/31/2016-present
- Process Design I
- Chemical Engineering Lab
- Fluid and Thermal Operations
- Corrosion Engineering Computations
- Aqueous Corrosion Lab 2
- Project Management and Teamwork
- Aqueous Corrosion Lab 1

Instructor, Department of Chemical and Biomolecular Engineering, The University of Akron

Courses:

- Chemical Engineering Computation 01/2014-05/2016
- Materials Science for Corrosion Engineering
- Chemical Engineering Laboratory
- Tools for Chemical Engineering
- Project Management and Teamwork
- Aqueous Corrosion Laboratory I
- Aqueous Corrosion Laboratory II
- High Temperature Corrosion Laboratory
- Transport phenomena (grading the exams)
- Statics
- Basic Chemistry
- Basic Chemistry Laboratory

Tasks:

- Planned and delivered well-structured lectures to engage and motivate students' participation
- Created lecture videos
- Developed new lab exercises based on scientific articles and standards
- Conducted laboratory sessions
- Created and graded course assignments to ensure students comprehension of course materials
- Involved in designing curriculum proposals for four new courses (Corrosion Engineering Technology Fundamentals I, Corrosion Engineering Technology Fundamentals II, Strategies for Corrosion Prevention, and Corrosion Engineering Technology Projects)
- Involved in organization and design of projects for Project Management and Team work course

Teaching Assistant, Department of Chemical Engineering and Applied Chemistry, University of Toronto
Course: Organic and Inorganic Chemistry 09/2005-12/2005
09/2004-12/2004

- Supervised 20-30 undergraduate students
- Conducted tutorials and laboratory sessions
- Organized weekly group meetings to present and discuss the results

Teaching Assistant, Department of Chemical Engineering and Applied Chemistry, University of Toronto
Course: Thermochemistry 01/2005-4/2005

- Supervised 30 undergraduate students
- Conducted tutorials and laboratory sessions
- Prepared laboratory equipment for different experiments
- Responded to students' questions in office hours
- Graded students' reports and provided regular feedback to them

Service Activities:

- Member of CBE undergraduate awards committee 2019
  - Evaluated students' applications
  - Worked with other committee members to nominate and select the awardees

- Super judge at Western reserve science day 2019
  - Attended students' presentations
  - Graded the presentations
  - Nominated the awardees

- Honors project reader 2018-present
  - Read student project reports (5 projects per year)
  - Provided students with feedback
  - Approved the corrections made based on the comments

- PMT mentor 2018-present
  - Meet with students' groups
  - Provided them with the feedback on project progress

- Engineering design day coordinator 2018-2019
  - Organized the presentations
  - Attended students' presentations
  - Graded the presentations with judges
  - Nominated the awardees

- Participated in welcome back/information table in Schrank Hall South to meet and help new students and returning students to campus 2018

- Helped prepare a proposal for a new Corrosion Associate Degree at The University of Akron 2015
  - Wrote the proposal together with another faculty member

- Helped with designing curriculum proposals for four new courses (Corrosion Engineering Technology Fundamentals I, Corrosion Engineering Technology Fundamentals II, Strategies for Corrosion Prevention, and Corrosion Engineering Technology Projects) 2015
  - Wrote the proposals together with another faculty member

Professional Development

- Participated in National Effective teaching Institute (NETI-1A) workshop
- Participated in Think Like an Engineer: Active Learning in Engineering Classroom symposium by McGraw Hill
- Participated in CHEMCAD workshop

Supervisory Experience

Supervision at the University of Michigan 01/2008-04/2008

- Supervised a group of third year mechanical engineers to design an anaerobic gassing station

Supervision at the University of Toronto 01/2004-09/2004

- Supervised one undergraduate student (Rachel Wai Chung Chan) in a four-month project and one undergraduate student (Jeffery Kwan) in a work-study program

Research Experience

Ph.D. Student, University of Toronto and *University of Michigan* 09/2006-10/2011

- Identified parameters that promote and prohibit growth of microorganisms in benzene-degrading nitrate-reducing cultures originated from benzene contaminated sites
- Identified bacterial species responsible for initial attack on benzene ring in enrichment cultures
- Isolated pure cultures of acetate-oxidizing denitrifying microbes
- Identified novel carboxylase genes encoding a carboxylase enzyme possibly involved in activation of benzene ring

M.A.Sc. Student, University of Toronto 07/2003-08/2005

- Studied the influence of relative humidity and carbon dioxide on the performance of a therapeutic lung surfactant
- Established the inhibitory effect of relative humidity on the surface properties of a therapeutic lung surfactant

Research Assistant, University of Toronto 05/2006-09/2006

- Maintained and established benzene-degrading nitrate-reducing enrichment cultures
- Measured benzene degradation activity and nitrate reduction in the cultures using gas chromatography and ion chromatography

Research Assistant, University of Toronto 06/2002-06/2003

- Studied the inhibitory effect of plasma proteins such as Albumin on surface activity of lung surfactant
- Investigated the effect of nonionic polymers on enhancing the performance of exogenous lung surfactant used in surfactant replacement therapy
- Measured the surface tension of organic liquids by drop shape techniques

Industrial Experience

Chemical Engineer, Polytechnic University of Technology 10/2000-11/2001

- Participated in the preparation of a proposal for production of Polyurethane
- Worked with a team of mechanical and material science engineers to design a pilot plant for the production of polyurethane

Chemical Engineer, Quality Control Laboratory, *Behshahr Industrial Company* 05/1998-09/1998

- Conducted quality control tests of products according to national standards

Selected Skills

- Analytical methods: Gas chromatography, ion chromatography, high performance liquid chromatography
- Metallographic techniques
- Microbiology and molecular biology techniques: Cell culture, isolation techniques, clone library preparation, quantitative polymerase chain reaction, polymerase chain reaction, DNA and RNA extraction, fluorescent microscopy
- Measurement of surface tension of liquids using drop shape techniques
- Analysis of DNA and RNA sequences using molecular biology software packages MEGAN, BioEdit, and MEGA
- CHEMCAD

JOURNAL Publications

1. **R. Gitiafroz**, F. Luo, C. E. Devine, Y. Gong, L. A. Hug, L. Raskin, and E. A. Edwards, "Metatranscriptome of a Benzene-Degrading Nitrate-Reducing Culture reveals involvement of caboxylation in benzene ring activation", *Applied and Environmental Microbiology,* 2014; 80 (14), 4095-4107.

2. E. J. Acosta, **R. Gitiafroz**, Y.Y. Zuo, Z. Policova, P.N. Cox, M.L. Hair, A.W. Neumann, "Effect of Humidity on Lung Surfactant films subjected to dynamic compression/expansion cycles", *Respiratory Physiology & Neurobiology*, 2007; 155 (3), 255-267.

3. Y.Y. Zuo, **R. Gitiafroz**, E. J. Acosta, Z. Policova, P.N. Cox, M.L. Hair, A.W. Neumann, "Effect of Humidity on the Adsorption Kinetics of Lung Surfactant at Air-Water Interfaces", *Langmuir*, 2005; 21 (23), 10593-10601.

4. H. Tavana, **R. Gitiafroz**, M.L. Hair, A.W. Neumann, "Determination of Solid Surface Tension from Contact Angles: the Role of Shape and Size of Liquid Molecules", *Journal of Adhesion*, 2004; 8, 705-725.

CONFERENCE PRESENTATIONS (REFEREED)

1. **R. Gitiafroz**, C. E. Devine, E. A. Edwards, "Metabolic Pathways, Genes, and Enzymes in Anaerobic Benzene-Degrading Cultures: From "Omics" to Application ", Battelle Bioremediation Symposium, Reno, Nevada, June 27-30, 2011.

2. **R. Gitiafroz**, C. E. Devine, L. Hug, L. Raskin, E. A. Edwards, "Bacteria involved in Benzene Biodegradation under Nitrate-reducing Conditions", *ISME-13*, Seattle, Massachusetts, August 22-27, 2010.

3. **R. Gitiafroz**, C. E. Washer, L. Raskin, E. A. Edwards, Molecular Characterization of Cultures Capable of Anaerobic Biodegradation of Benzene under Nitrate-reducing Conditions", *108th ASM General Meeting*, Boston, Massachusetts, June 1-5, 2008.

4. **R. Gitiafroz**, C. Washer, M. Nandi, A. Ulrich, L. Raskin, E. A. Edwards, " Microorganisms Responsible for Anaerobic Biodegradation of Benzene under Nitrate-reducing Conditions", *Graham Environmental Sustainability Institute Annual Conference*, University of Michigan, Ann Arbor, MI. March 26-27, 2008.

5. **R. Gitiafroz**, C. Washer, M. Nandi, A. Ulrich, L. Raskin, E. A. Edwards, " Microorganisms Responsible for Anaerobic Biodegradation of Benzene under Nitrate-reducing Conditions", *Borchardt Conference*, University of Michigan, Ann Arbor, MI. February 27, 2008.

6. **R. Gitiafroz**, C. E. Washer, M. Nandi, A. Ulrich, E. A. Edwards, Microorganisms Involved in Anaerobic Benzene Biodegradation under Nitrate-reducing Conditions", *107th ASM General Meeting*, Toronto, Ontario, May 21-25, 2007.

7. **R. Gitiafroz**, Z. Policova, E. Acosta, H. Tavana, A. W. Neumann, "Study of Surface Tension of Lung Surfactant: Influence of Humidity on the Properties of the Surface Film", *79th ACS Colloid and Surface Science Symposium*, Clarkson University, Potsdam, NY, June 12-15, 2005.

8. Y.Y. Zuo, **R. Gitiafroz,** E. Acosta, Z. Policova, P. N. Cox, M. L. Hair, "The Effect of Humidity on the Adsorption Kinetics of Lung Surfactant at Air-Water Interfaces", *79th ACS Colloid and Surface Science Symposium*, Clarkson University, Potsdam, NY, June 12-15, 2005.

9. **R. Gitiafroz,** Z. Policova, M. Hoorfar, J. J. Lu, A.W. Neumann, "Study of Surface Tension of Lung Surfactant at High concentrations, using a Constrained Sessile Drop Technique", *78th ACS Colloid and Surface Science Symposium*, Yale University, New Haven, Connecticut, June 20-23, 2004.

REFERENCES

Prof. H. M. Cheung, Department of Chemical and Biomolecular Engineering, The University of Akron/Ohio's Polytechnic University, Akron, OH, 44325, Tel: (330) 972-7250, Email: cheung@uakron.edu

Prof. E. A. Evans, Department of Chemical and Biomolecular Engineering, The University of Akron/Ohio's Polytechnic University, Akron, OH, 44325, Tel: (330) 972-8292, Email: evanse@uakron.edu

Prof. E. A. Edwards, Department of Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, ON, M5S 3E5, Tel: (416) 946-3506, Email: elizabeth.edwards@utoronto.ca

Prof. L. Raskin, Department of Civil and Environmental Engineering, University of Michigan, Ann Arbor, MI, 48109-2125, Tel: (734) 647-6920, Email: raskin@umich.edu