

## **Curriculum Vitae**

Ehsan Mahdinia

Assistant Professor

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Editor: MDPI *Processes*, Special Issue " [Novel Processes for Development of Fermentation-Based Products](#)"

## **Education**

2014 - 2018: Ph.D. in Microbiological Engineering

Agricultural and Biological Engineering Department, The Pennsylvania State University, University Park, PA, USA, GPA: (3.82/4) (Top 10%)

2010 - 2013: M.S. in Biotechnology

Department of Chemical and Petroleum Engineering, Sharif University of Technology, Tehran, Iran, GPA: (16.80/20) (Fourth Best GPA in Class of 2013-Top 10%)

2006 - 2010: B.S. in Chemical Engineering

Department of Chemical and Petroleum Engineering, Sharif University of Technology, Tehran, Iran, GPA: (15.9/20) (Top 25%)

## **Teaching Experience**

- Penn State Graduate School Teaching Certificate (2017)

### **Lecturer:**

•“Microbiological Engineering”, served as a substitute lecturer for Agricultural and Biological Engineering Department at Penn State (Spring 2019)

### **TA:**

•“Microbiological Engineering”, lecturer: Prof. Ali Demirci,  
Penn State (Spring 2016 and Spring 2018)

•“Engineering Elements of Biochemistry and Microbiology”, lecturer: Prof. Ali Demirci,

Penn State (Fall 2015 and Fall 2017)

- “Engineering Properties of Food and Biological Materials”, lecturer: Prof. Virendra Puri, Penn State (Fall 2015 and Fall 2017)
- “Modeling Methods for Biological Systems”, lecturer: Dr. Megan Marshall, Penn State (Fall 2017)
- “Fluid Mechanics”, lecturer: Prof: Dariush Bastani, Islamic Azad University (Spring 2013).
- “Chemical Engineering Thermodynamics”, lecturer: Prof. Farhad Khorasheh, Sharif University of Technology (Fall and Spring 2012).
- “Fundamentals of Biochemical Engineering”, lecturer: Prof. Manouchehr Vossoughi, Sharif University of Technology (Fall 2011 and Fall 2012).
- “Food Processing Technology Principles”, lecturer: Prof. Manouchehr Vossoughi, Sharif University of Technology (Spring 2011 and Spring 2012).
- “Food Biochemistry”, lecturer: Prof. Iran Alemzadeh, Sharif University of Technology (Spring 2010 and Spring 2012).

## **Research Projects**

- Dairy and vegan proteins characterization using prototype Protein Characterization Unit and Hyper Pressure Jet technology (Postdoctoral scholarship PI: Prof. Federico M. Harte)
- Menaquinone-7 (vitamin K2) production by *Bacillus subtilis natto* in a biofilm reactor (Ph.D. dissertation advised by Prof. Ali Demirci) (PCT application: PCT/US2019/065358)
- Extracellular L-asparaginase production in *Candida utilis*: production and activity determination conditions (M.S. thesis advised by Prof. Manouchehr Vossoughi)
- Enzymatic biodegradation of phenols & polyphenols in olive oil mill wastewaters (B.S. thesis advised by Prof. Iran Alemzadeh)
- Production of recombinant human lysozyme using *Kluveromyces lactis K7*
- Plant contamination by organic pollutants in phytoremediation
- Potato starch recovery from potato chips production wastewater using continuous axial centrifuges

## **Publications**

### **1. Book chapters:**

- Chapter Title: Chapter 7: Bioreactor scale-up  
Book Title: Essentials in Fermentation Technology  
Authors: Ehsan Mahdinia<sup>a</sup>, Deniz Cekmecelioglu<sup>b</sup>, Ali Demirci<sup>c\*</sup>

<sup>a</sup>Department of Food Science  
Pennsylvania State University  
University Park, PA 16802, USA. Email – mahdinia@psu.edu

<sup>b</sup>Department of Food Engineering,  
Middle East Technical University  
Ankara, Turkey 06531

<sup>c</sup>Department of Agricultural and Biological Engineering  
Editor: Dr. Aydin Berenjjan (Faculty of Engineering-University of Waikato New Zealand)

Publisher: Springer International Publishing AG, part of Springer Nature 2018  
[https://doi.org/10.1007/978-3-030-16230-6\\_7](https://doi.org/10.1007/978-3-030-16230-6_7)

- Chapter Title: Chapter 14: Microbial Growth Modeling  
Book Title: Food Safety Engineering  
Authors: Ehsan Mahdinia<sup>1</sup>, Shaowei Liu<sup>2</sup>, Ali Demirci<sup>3</sup>, and Virendra M. Puri<sup>4\*</sup>  
<sup>1</sup>Postdoctoral Scholar, Department of Food Science, Penn State, University Park, PA 16802, USA. Email – mahdinia@psu.edu  
<sup>2</sup>Department of Food Science and Technology, East China University of Science and Technology, Shanghai, China. Email – swliu@ecust.edu.cn.  
<sup>3</sup>Professor, Department of Agricultural and Biological Engineering, Penn State, University Park, PA 16802, USA. Email – demirci@psu.edu.  
<sup>4</sup>Distinguished Professor  
Department of Agricultural and Biological Engineering, Penn State, University Park, PA 16802, USA. Email – vmpuri@psu.edu  
Editor: Dr. Hao Feng (Department of Food Science and Human Nutrition University of Illinois at Urbana-Champaign)  
Publisher: Springer International Publishing AG, part of Springer Nature 2018  
[https://doi.org/10.1007/978-3-030-42660-6\\_14](https://doi.org/10.1007/978-3-030-42660-6_14)
- Chapter Title: Chapter 4: Biofilms in Fermentation for the Production of Value-added Products  
Book Title: Microbial Biofilms Properties and Applications in the Environment, Agriculture and Medicine  
Authors: Ehsan Mahdinia<sup>1</sup>, Ali Demirci<sup>2\*</sup>  
<sup>1</sup>Assistant Professor, Center for Biopharmaceutical Education and Training, Albany College of Pharmacy and Health Sciences, Albany, NY 12208, USA. Email – Ehsan.Mahdinia@acphs.edu  
<sup>2</sup>Professor, Department of Agricultural and Biological Engineering, Penn State, University Park, PA 16802, USA. Email – demirci@psu.edu.  
Editor: Dr. Bakrudeen Ali Ahmed (Faculty of Applied Sciences, Ton Duc Thang University, Ho Chi Minh City, Vietnam)  
Publisher: CRC Press (Taylor & Francis Group)  
ISBN-13: 978-0367415068

## 2. Peer-reviewed articles:

- Mahdinia E., Demirci A. and Berenjjan A. (2017), Production and application of menaquinone-7 (vitamin K<sub>2</sub>): a new perspective. World Journal of Microbiology and Biotechnology, 33(1), 2. <https://doi.org/10.1007/s11274-016-2169-2>
- Mahdinia E., Demirci A. and Berenjjan A. (2017), Strain and plastic composite support (PCS) selection for vitamin K (Menaquinone-7) production in biofilm reactors. Bioprocess and Biosystems Engineering 40(10), 1507-1517. <https://doi.org/10.1007/s00449-017-1807-x>
- Mahdinia E., Demirci A. and Berenjjan A. (2018), Optimization of *Bacillus subtilis natto* growth parameters in glycerol-based medium for vitamin K (Menaquinone-7) production in biofilm reactors, Bioprocess and Biosystems Engineering, 41(2), 195-204. <https://doi.org/10.1007/s00449-017-1857-0>
- Mahdinia E., Demirci A. and Berenjjan A. (2018), Utilization of glucose-based medium and optimization of *Bacillus subtilis natto* growth parameters for vitamin K (Menaquinone-7) production in biofilm reactors. Biocatalysis and Agricultural Biotechnology, 13(1), 219-224. <https://doi.org/10.1016/j.bcab.2017.12.009>
- Mahdinia E., Demirci A. and Berenjjan A. (2018), Implementation of fed-batch strategies for vitamin K (menaquinone-7) production by *Bacillus subtilis natto* in biofilm reactors. Applied Microbiology and Biotechnology. 102(21), 9147-9157. [https://doi.org/10.1007/978-3-030-16230-6\\_7](https://doi.org/10.1007/978-3-030-16230-6_7)
- Mahdinia E., Demirci A. and Berenjjan A. (2018), Enhanced vitamin K (Menaquinone-7) production by *Bacillus subtilis natto* in biofilm reactors by optimization of glucose-based Medium. Current Pharmaceutical Biotechnology. 19(11), 917-924. <https://doi.org/10.2174/1389201020666181126120401>
- Mahdinia E., Demirci A. and Berenjjan A. (2019), Effects of components in a glycerol-based medium on vitamin K (Menaquinone-7) production by *Bacillus subtilis natto* in biofilm reactors. Bioprocess and Biosystems Engineering. 42(2), 223-232. <https://doi.org/10.1007/s00449-018-2027-8>
- Mahdinia E., Demirci A. and Berenjjan A. (2019), Modeling of vitamin K (Menaquinone-7) fermentation by *Bacillus subtilis natto* in biofilm reactors. Biocatalysis and Agricultural Biotechnology. 17(2019), 196-202. <https://doi.org/10.1016/j.bcab.2018.11.022>
- Mahdinia E., Demirci A. and Berenjjan A. (2019), Evaluation of vitamin K (Menaquinone-7) stability and secretion in glucose and glycerol-based media by *Bacillus subtilis natto*. Acta Alimentaria. 48(4), 405-414. <https://doi.org/10.1556/066.2019.48.4.1>

- Mahdinia E., Demirci A. and Berenjian A. (2019), Biofilm reactors as a promising method for vitamin K (Menaquinone-7) production. *Applied Microbiology and Biotechnology*. 103(14), 5583-5592. <https://doi.org/10.1007/s00253-019-09913-w>
- Entezari A., Wang R.Z., Zhao S., Mahdinia E., Wang J.Y., Tu Y.D., Huang D.F. (2019), Sustainable agriculture for water-stressed regions by air-water-energy management. *Energy*. 181(2019), 1121-1128. <https://doi.org/10.1016/j.energy.2019.06.045>
- Mahdinia E., Demirci A. and Berenjian A. (2019), Secondary models utilization for describing vitamin K (Menaquinone-7) fermentation by *Bacillus subtilis natto* in biofilm reactors. *Applied Microbiology and Biotechnology*. Under review.
- Mahdinia E., Goulder D., Kadkhodaei B. and Harte F.M. (2019), Determination of casein micelle intermediates in milk through citrate and tartrate ion-protein interactions using a prototype Protein Characterization Unit (PCU). *Journal of Dairy Science*, Under Review.

### 3. Conference articles:

- Mahdinia E., Demirci A. and Berenjian A. (2017), Strain and plastic composite support (PCS) selection for vitamin K (Menaquinone-7) production in biofilm reactors. An ASABE meeting presentation. Paper Number: 17-012. doi:10.13031/nabec2017-012.
- Mahdinia E., Demirci A. and Berenjian A. (2018), Vitamin K2 (Menaquinone-7) production by *Bacillus subtilis natto* by using a glucose-based medium in biofilm reactors. 2018 ASABE Annual International Meeting, Paper No. 1800333, pages 1-17. doi:10.13031/aim.201800333.
- Mahdinia E., Demirci A. and Berenjian A. (2018), Vitamin K2 (Menaquinone-7) production by *Bacillus subtilis natto* by using a glucose-based medium in biofilm reactors. 2018 NABEC Annual Meeting
- Mahdinia E., Demirci A. and Berenjian A. (2018), Vitamin K2 (Menaquinone-7) production by *Bacillus subtilis natto* by using a glycerol-based medium in biofilm reactors. 2018 NABEC Annual Meeting
- Mahdinia E., Demirci A. and Berenjian A. (2018), Optimization of *Bacillus subtilis natto* growth parameters in glycerol-based medium for MK-7 (vitamin K) production in biofilm reactors. NABEC, 2017 Northeast Agricultural Biological Engineering Conference, Paper No. 17-011, pages 1-11. doi:10.13031/nabec2017-011.

### Awards

- Journal of Biocatalysis and Agricultural Biotechnology (ISSN: 1878-8181): Recognized reviewer (2019)

- Journal of Biocatalysis and Agricultural Biotechnology (ISSN: 1878-8181): Outstanding reviewer (2017)
- 3rd Place Poster Award: The Northeast Agricultural and Biological Engineering Conference (NABEC) 2018, July 15-18th 2018, Morgantown WV.
- 1st Place Poster Award: 4th Annual Life Science Symposium, Penn State, May 18th 2018.
- 1st Place Lightning Talk Award: 4th Annual Life Science Symposium, Penn State, May 18th 2018.
- 2nd place Graduate Poster Presentation: 21th Annual Environmental, Chemistry and Microbiology Student Symposium, April 13-14, 2018,
- 1st Place Poster Presentation: Allegheny Branch of American Society for Microbiology, November 3-4, 2017.
- First Prize: 22nd Annual Gamma Sigma Delta Exhibition, March 30, 2017
- Best Paper Award: 14th Annual College of Engineering Research Symposium, April 4th, 2017
- 2nd place Graduate Oral Presentation: 20th Annual Environmental, Chemistry and Microbiology Student Symposium, April 21-22, 2017,
- Award for Excellence: Joint International Conference ISOCARP-OAPA, October 24-27, 2017.
- Member: Gamma Sigma Delta: The Honor Society of Agriculture; Since Spring 2016.
- Active Member: Alpha Epsilon: The Honor Society of Agricultural, Food and Biological Engineering; Since Fall 2015.
- Excellence in Leadership: Iranian Student Association at Penn State; (2016-2017).
- Graduate Assistantship: Ph.D. program in Microbiological Engineering at The Pennsylvania State University. (2014-2018).
- Sahakian Endowment Graduate Travel Award: NABEC 2017, July 30-August 2.
- Juniata College Travel Award: ABASM 2017, November 3-4.
- Member: KIMIA Scientific Group; The Honor Society of Chemical and Petroleum Engineering at Sharif University of Technology (Fall 2010)
- Nationwide Universities Entrance Exam for Graduate Programs in Biotechnological Engineering (2010): Ranked 2nd out of approximately 2000 Contestants
- Nationwide Universities Entrance Exam for Undergraduate Programs (2006): Ranked 709th out of approximately 500000 Contestants.
- Silver Medal: Fifth National Student Laboratory Olympiads, (2005) Yazd, Iran.

## **Leadership**

- Alpha Epsilon: The Honor Society of Agricultural, Food and Biological Engineering:

- Treasurer (2016-2017)
- Vice President (2017-2018)
- Iranian Student Association at Penn State:
  - Secretary (2015-2016)
  - Secretary (2016-2017)
  - Vice President (2017-2018)
- Regional Center on Urban Water Management (RCUWM-Tehran) under the auspices of UNESCO:
  - PR and International Affairs Manager (2010-Present)
- KIMIA Scientific Group; The Honor Society of Chemical and Petroleum Engineering at Sharif University of Technology:
  - Vice President (2010-2011)

## **Skills and Qualifications**

### Scientific & Lab Skills:

- Expert in bench-top and pilot-scale fermenters
- Expert in advanced chemistry lab techniques: NMR, UV-Visible spectroscopy, FPLC, UPLC and HPLC.
- Expert in general chemistry lab techniques: Gravimetric Analyses, Titration, Elemental Analyses, Calorimetry, Spectrophotometry, Distillation, Extraction, Precipitation, Conductometry, Chromatography and Electrophoresis.
- Expert in microbiology lab techniques: Microbial Fermentation, Pasteurization & Sterilization.

### Also familiar with:

- Mammalian & Plant Cell Culture, Gas Chromatography (GC), TLC, IR, Mass Spectroscopy, SEM, TEM, etc.

### Languages:

- English: Fluent
- Persian: Mother Tongue language
- Arabic: Familiar
- Spanish: Familiar

### Computer Skills

- Linux and Windows operating systems (skillful)
- Microsoft Office: Word, Excel, Power Point, Access (skillful)

- Expert in Minitab, Design Expert and RSM designs, STELLA, LabVIEW
- Also familiar with MATLAB, COMSOL, FEMLAB, HYSYS

Extracurricular Activities:

- Amateur small-bore and air-rifle marksman (2014-2016);
- Penn State Rifle Team: Member (2016)
- Amateur basketball player; winner of several school and university Olympiads (2003-2014); Sharif University of Technology Basketball Team: Member (2009-2012)
- Amateur swimmer and angler (No Muskies yet...) (2009-present)