

# Sonia Modarres Razavi

Assistant Research Professor  
Department of Chemical and Biochemical Engineering  
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D.O.B: 08/07/1985  
P.O.B: Mashhad, Iran  
Citizenship: U.S.

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## Summary:

- A dynamic leader with a background in mechanical engineering by training with equal interest in pharmaceuticals, Solid Dosage Form in particular. Key skills include:
  - Hands-on experience on variety of pharmaceutical unit operations and characterization devices.
  - Expertise in areas of powder characterization, tableting, and understanding relationships between material properties and performance of the material in unit operations
  - Proven leadership and supervisory abilities, developed through mentoring, project managing and coordinating, and teaching experience
  - Managing research and developmental projects associated with the continuous pharmaceutical manufacturing line
  - Communications with companies, equipment, and team responsibilities
  - Presenting information clearly and concisely in both verbal and written form
  - Effectively collaborating in a diverse team environment

## Education:

**Rutgers, The State University of New Jersey**, New Brunswick, NJ January 2013 - October 2017  
*PhD* in Mechanical and Aerospace Engineering

**Thesis topic:** “A Framework for Developing Optimal Tensile Strength Relationships Based on Characterization Tools with Focus on: Particle shape, Lubricant Sensitivity, and Tablet Shape”

**Texas A&M University**, College Station, TX January 2012 - January 2013  
Pursuing *PhD* in Materials Science and Engineering Interdisciplinary Graduate Program

**Texas A&M University**, College Station, TX December 2012  
*Master of Science* in Mechanical Engineering

**Thesis topic:** “Effect of Texture on Formability and Mechanical Anisotropy of a Severe Plastically Deformed Magnesium Alloy”

**Ferdowsi University of Mashhad**, Mashhad, Iran August 2008  
*Bachelor of Science* in Mechanical Engineering

**Thesis topic:** “Detection of Heart Diseases through Analysis of Heart Sound Signals”

## Research Experience:

**NSF ERC for Structured Organic Particulate Systems (C-SOPS) – Rutgers University**

- Assistant Research Professor Start date: September 2021
- Postdoctoral Associate September 2017 – August 2021

## Teaching Experience:

**Rutgers, The State University of New Jersey**, New Brunswick, NJ

- SUPER Faculty Mentor, “Introduction to Scientific Research (ISR) Course” Spring 2023, Spring 2024
- Co-instructor, “Pharmaceutical Process Design II: Pharmaceutical Unit Operations” Spring 2024
- Instructor, “Statics” Spring 2018
  - Prepared and managed a class of 200+ students
  - Received student feedback above the average of the department

## Honors/Awards:

- Selected as a Graduate Mentor Fellow, Honors College in New Brunswick 2016 - 2017

- MAE Graduate Fellowship December 2016
- Recipient of 2016 NJPhAST Graduate Scholarship May 2016
- Student Travel Award, SES Annual Technical Meeting 2014
- Competitive Scholarship Waiver 2009 - 2010
- Ranked among the top 1% in the Annual National Undergraduate Entrance Exam 2003

## Publications:

### 1. Book chapter

1. Callegari, G., **Razavi, S.M.**, Omar, T., and Muzzio F.J. (2023). Oral solid dosage forms. Martin's Physical Pharmacy and Pharmaceutical Sciences.
2. **Razavi, S.M.**, Dubey, A., Muzzio, F.J. (2023) Residence time distribution. Continuous Pharmaceutical Processing and Process Analytical Technology.
3. **Razavi, S. M.**, Yohannes, B., Singh, R., Gonzalez, M., Lee, P. L., Muzzio, F. J., & Cuitino, A. M. (2022). Continuous tableting. How to Design and Implement Powder-to-Tablet Continuous Manufacturing Systems, 159.
4. **Razavi, S. M.**, Oka, S., Escotet-Espinoza, M. S., Wang, Y., Li, T., Futran, M., & Muzzio, F. J. (2022). Characterization of material properties. In How to Design and Implement Powder-To-tablet Continuous Manufacturing Systems (pp. 9-28). Academic Press.

### 2. Peer-reviewed journal paper (Google Scholar: 318 citations, h-index = 7, i10-index: 7)

1. Bhalode, P., **Razavi, S.M.**, Roman-Ospino, A., Dubey, A., Ierapetritou, M.G., Muzzio, F.J. (2023) Statistical data pre-treatment for residence time distribution studies in pharmaceutical manufacturing. (Submitted to IJP)
2. **Razavi, S. M.**, Román-Ospino, A. D., Bhalode, P., Scicolone, J., Callegari, G., Dubey, A., ... & Muzzio, F. (2023). Selection of an appropriate tracer to measure the residence time distribution (RTD) of continuous powder blending operations. Powder Technology, 429, 118864.
3. Bhalode, P., **Razavi, S. M.**, Roman-Ospino, A., Scicolone, J., Callegari, G., Tian, G., ... & Muzzio, F. J. (2023). Optimal quantification of residence time distribution profiles from a quality assurance perspective. International Journal of Pharmaceutics, 634, 122653.
4. Tian, H., Bhalode, P., **Razavi, S. M.**, Koolivand, A., Muzzio, F. J., & Ierapetritou, M. G. (2022). Characterization and propagation of RTD uncertainty for continuous powder blending processes. International Journal of Pharmaceutics, 628, 122326.
5. Baranwal, Y., Román-Ospino, A. D., Li, J., **Razavi, S. M.**, Muzzio, F. J., & Ramachandran, R. (2022). Prediction of Entire Tablet Formulations From Pure Powder Components Spectra via a Two-Step Non-Linear Optimization Methodology. International Journal of Pharmaceutics, 121472.
6. Bhalode, P., Tian, H., Gupta, S., **Razavi, S. M.**, Roman-Ospino, A., Talebian, S., ... & Ierapetritou, M. (2021). Using residence time distribution in pharmaceutical solid dose manufacturing—A critical review. International Journal of Pharmaceutics, 610, 121248.
7. **Razavi, S. M.**, Tao, Y., Scicolone, J., Morker, T., Cunningham, C., Rajabi-Siahboomi, A., ... & Muzzio, F. J. (2021). Starch Products as Candidate Excipients in a Continuous Direct Compression Line. Journal of Pharmaceutical Innovation, 1-12.
8. **Razavi, S. M.**, Scicolone, J., Snee, R. D., Kumar, A., Bertels, J., Cappuyns, P., ... & Muzzio, F. (2020). Prediction of tablet weight variability in continuous manufacturing. International Journal of Pharmaceutics, 575, 118727.
9. **Razavi, S. M.**, Gonzalez, M., & Cuitiño, A. M. (2018). Quantification of lubrication and particle size distribution effects on tensile strength and stiffness of tablets. Powder Technology, 336, 360-374.
10. Moghtadernejad, S., Escotet-Espinoza, M.S., Oka, S., Singh, R., Liu, Z., Román-Ospino, A.D., Li, T., **Razavi, S.**, Panikar, S., Scicolone, J. and Callegari, G., 2018. A training on: continuous manufacturing (direct compaction) of solid dose pharmaceutical products. Journal of Pharmaceutical Innovation, 13(2), pp.155-187.
11. **Razavi, S. M.**, Callegari, G., Drazer, G., & Cuitino, A. M. (2016). Toward predicting tensile strength of pharmaceutical tablets by ultrasound measurement in continuous manufacturing. International journal of pharmaceutics, 507(1-2), 83-89.
12. **Razavi, S. M.**, Gonzalez, M., & Cuitino, A. M. (2015). General and mechanistic optimal relationships for tensile strength of doubly convex tablets under diametrical compression. International journal of pharmaceutics, 484(1-2), 29-37.
13. **Razavi, S. M.**, Foley, D. C., Karaman, I., Hartwig, K. T., Duygulu, O., Kecskes, L. J., ... & Hammond, V. H. (2012). Effect of grain size on prismatic slip in Mg–3Al–1Zn alloy. Scripta Materialia, 67(5), 439-442.

### **Conference Presentations (Presenter in bold):**

- **Razavi S.M.**, Scicolone, J., Ortega-Zuniga, C., Bhalode, P., Li, J., Tian H., Lugo, Y., Gonzalez, A., Otava, M., Oze, G., Ierapetritou, M., Muzzio, F., Characterization of Residence Time Distribution of One Formulation on Two Mirror Continuous Lines, AIChE 2023 Annual Meeting, November 6, 2023, Orlando, FL, USA.
- **Razavi S.M.**, Bhalode, P., Scicolone, J., Ortega-Zuniga, C., Tian, H., Ierapetritou, M., Muzzio, F. Strategies for Data Treatment of RTD Curves for Pharmaceutical Applications, 2023 PharmSci 360, AAPS, Oct 23, 2023, Orlando, FL, USA.
- Sen, A., Shinde, R., Vyas, Z., Shetty, A., Callegari, G., **Razavi, S. M.** and Muzzio F. Powder Characterization Using an Annular Ring Shear Cell Under Temperature and Humidity Control. AIChE 2023 Annual meeting, November 2023, Orlando, FL, USA.
- **Sen, A.**, Vyas, Z., Shinde, R., Shetty, A., Callegari, G., Razavi, S. M., Muzzio, F. J. (2023). Characterization of Pharmaceutical Powder Flowability Using a Powder Flow Cell Coupled to an Air-Bearing Rheometer”, AIChE 2023 Annual Meeting, November 2023, Orlando, FL, USA..
- **Khakbiz, M., R.**, Ortega-Zuniga, C., Scicolone, J., Razavi, S. M., Singh, R., Callegari, G., Muzzio, F. (2023). Machine learning approach for prediction of NIR spectra and residence time distributions curves in pharmaceutical continuous manufacturing. IFPAC, 4-7 June, Maryland, USA.
- **Razavi, S. M.**, Roman-Ospino A., Dubey, A., Ierapetritou, M., Muzzio, F. Implementation of a Methodology for Selection of an Appropriate Tracer to Measure the Residence Time Distribution (RTD) of Continuous Powder Blending Operations, AIChE 2021 Annual Meeting, November 10, 2021, Boston, MA, USA.
- **Li, J.**, Scicolone, J., Razavi, S. M., Roman-Ospino, A., Ortega-Zuniga, C., Ierapetritou, M., Muzzio, F. Residence Time Distribution (RTD) Study of Chute Transition Zones between Unit Operations, 2021 AIChE Annual Meeting, Boston, MA.
- **Tao, Y.**, Razavi, S. M., Morker, T., Hausner, D., Cunningham, C., Rajabi-Siahboomi, A., Muzzio, F. Characterization of Starch Products in Continuous Direct Compression Process. 2020 Virtual AIChE Annual Meeting.
- **Razavi, S. M.**, Gonzalez, M., Cuitino, A. Quantification of Lubrication and Particle Size Distribution Effects on Tensile Strength and Stiffness of Tablets, 8th World Congress on Particle Technology, April 22-26, 2018, Orlando, FL, USA.
- **Razavi, S. M.**, Cuitino, A. Toward Predicting Tensile Strength and Characterizing the Acoustic Properties of Pharmaceutical Tablets on Continuous Manufacturing Platforms, AIChE 2016 Annual Meeting, November 13-18, 2016, San Francisco, CA, USA.
- **Keyvan, G.**, Razavi S. M., Drazer, G., Cuitino, A., Muzzio, F. Real Time Prediction of Tablet Tensile Strength By Ultrasound in Continuous Manufacturing. AIChE 2016 Annual Meeting, November 13-18, 2016, San Francisco, CA, USA.
- **Keyvan, G.**, Lie, X., Razavi S. M., Cuitino, A., Muzzio, F. Effects of Operating Parameters on Tablet Quality in a Continuous Manufacturing Line. AIChE 2015 Annual Meeting, November 8-13, 2015, Salt Lake City, UT
- **Razavi, S. M.**, Keyvan, G., Pallavi, P., Cuitino, A. Ultrasound testing to measure mechanical properties of tablets in continuous manufacturing, ASME 2015 IMECE, November 13-19, 2015, Houston, TX, USA.
- **Razavi, S. M.**, Gonzalez, M., Cuitino, A. General and mechanistic optimal relationships for tensile strength of doubly convex tablets under diametrical compression, SES Annual Technical Meeting, October 1-3, 2014, West Lafayette, IN, USA.
- **Razavi, S. M.**, Karaman, I., Effect of Texture and Grain Size on the Formability and Mechanical Anisotropy of Severe Plastically Deformed Magnesium Alloys, MS&T 2011, Columbus, OH, USA.

### **Reference:**

Upon request.