

MEENESH R. SINGH

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Educational Background

Doctor of Philosophy , Chemical Engineering Purdue University, USA	<i>Jan 2009-March 2013</i>	GPA: 4.0/4.0
Master of Technology , Chemical Engineering Indian Institute of Technology-Bombay (IIT-B), India	<i>August 2006-08</i>	GPA: 9.18/10
Bachelor of Engineering , Chemical Engineering Sardar Patel University, Gujarat, India	<i>August 2001-05</i>	GPA: 8.41/10

Academic Positions

Assistant Professor Department of Chemical Engineering, University of Illinois at Chicago	<i>Aug 2016 – present</i>
Affiliate Scientist Joint Center for Artificial Photosynthesis, Lawrence Berkeley National Lab	<i>Aug 2016 – Nov 2017</i>
Postdoctoral Scholar Joint Center for Artificial Photosynthesis, U C Berkeley, Lawrence Berkeley National Lab <i>Title: Artificial Photosynthesis for CO₂ Reduction</i> <i>Supervisor: Alexis T. Bell</i>	<i>Jan 2014 – Aug 2016</i>
Postdoctoral Scholar Joint Center for Artificial Photosynthesis, U C Berkeley, Lawrence Berkeley National Lab <i>Title: Analysis of Solar-Fuel Generators</i> <i>Supervisor: Rachel A. Segalman</i>	<i>March 2013 – Jan 2014</i>
Research Intern , Abbott Labs: Global Pharma R&D <i>Title: Experimental Investigation of Crystal Morphology during Dissolution and Growth</i> <i>Supervisors: Nandkishor Nere, Hsien-Hsin Tung and Shailendra Bordawekar</i>	<i>May 2011 – July 2011</i>
Graduate Research Assistant , Purdue University <i>Title: Towards Control of Crystal Shape and Morphology Distributions in Crystallizers</i> <i>Advisor: Doraiswami Ramkrishna</i>	<i>Jan 2009 – March 2013</i>
Research Assistant , IIT-B <i>Title: Monte Carlo Simulations for Growth of Nanoparticles in Microemulsion</i> <i>Supervisors: Anurag Mehra, Rochish Thaokar and Jayesh Bellare</i>	<i>July 2008 – Nov 2008</i>
Graduate Research Assistant , IIT-B <i>Title: Cryogenic Grinding for Synthesis of Nanoparticles and Extraction of Protein and DNA from Cells</i> <i>Advisors: Jayesh Bellare and Sandip Roy</i>	<i>Jan 2007 – May 2008</i>

Awards and Honors

1. George Klinzing Best PhD Award, AIChE	<i>Nov. 2015</i>
2. Faculty Lectureship Award, School of Chemical Engineering, Purdue University	<i>March 2014</i>
3. AIChE Process Development Division Student Paper Award	<i>Nov. 2013</i>
4. ACS I&EC Division Graduate Student Award (Invited Talk)	<i>Sept. 2013</i>

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| 5. Outstanding Graduate Student Research Award, College of Engineering, Purdue University | March 2013 |
| 6. AIChE Separation Division Graduate Student Research Award | Oct 2012 |
| 7. McDonnell Douglas Fellowship | Fall 2012 |
| 8. Eastman Travel Grant | Oct 2012 |
| 9. Shreve Travel Award | Oct 2011 |
| 10. 2 nd Place Presentation Award in Computational Science and Engineering Student Conference, SIAM at Purdue University | April 2013 |
| 11. 1 st Place Presentation in 19 th Annual Chemical Engineering Graduate Research Symposium, Purdue University | Aug 2010 |
| 12. Ministry of Human Resource Development (MHRD) Scholarship, IIT-B | Aug 2006 – May 2008 |

Journal Publications

From IIT Bombay

1. **Meenesh R. Singh**, Sandip Roy and Jayesh R. Bellare, "Influence of Cryogenic Grinding on Release of Protein and DNA from *Saccharomyces cerevisiae*," International Journal of Food Engineering, 5 (1), 9, 2009.

From Purdue University

2. Jayanta Chakraborty, **Meenesh R. Singh**, Doraiswami Ramkrishna, Christian Borchert and Kai Sundmacher, "Modeling of Crystal Morphology Distributions. Towards Crystals With Preferred Asymmetry," Chemical Engineering Science (Pharmaceutical Engineering Science- A Key for Tomorrow's Drugs), 65 (21), 5676-5686, 2010.
3. **Meenesh R. Singh**, Jayanta Chakraborty, Nandkishor Nere, Hsien-Hsin Tung, Shailendra Bordawekar and Doraiswami Ramkrishna, "Image-Analysis-Based Method for Measurement of 3D Crystal Morphology and Polymorph Identification using Confocal Microscopy," Crystal Growth & Design, 12 (7), 3735-3748, 2012.
4. **Meenesh R. Singh**, Parul Verma, Hsien-Hsin Tung, Shailendra Bordawekar and Doraiswami Ramkrishna, "Screening Crystal Morphologies from Crystal Structure," Crystal Growth & Design, 13 (4), 1390-1396, 2013.
5. **Meenesh R. Singh** and Doraiswami Ramkrishna, "A Comprehensive Approach to Predicting Crystal Morphology Distributions with Population Balances," Crystal Growth & Design, 13 (4), 1397 – 1411, 2013.
6. **Meenesh R. Singh** and Doraiswami Ramkrishna, "Dispersions in Crystal Nucleation and Growth Rates: Implications of Fluctuation in Supersaturation," Chemical Engineering Science, 107 (7), 102-113, 2014.
7. Doraiswami Ramkrishna and **Meenesh R. Singh**, "Population Balance Modeling. Current Status and Future Prospects," Annual Review of Chemical and Biomolecular Engineering, 5 (1), 123-146, 2014. (**Invited Review**)
8. **Meenesh R. Singh**, Nandkishor Nere, Hsien-Hsin Tung, Samrat Mukherjee, Shailendra Bordawekar, and Doraiswami Ramkrishna, "Measurement of Polar Plots of Crystal Dissolution Rates using Hot-Stage Microscopy. Some Further Insights into Dissolution Morphologies," Crystal Growth & Design, 14 (11), 5647 – 5661, 2014.

From JCAP and LBNL

9. **Meenesh R. Singh**, John C. Stevens, and Adam Z. Weber, "Design of Membrane-Encapsulated Wireless Photoelectrochemical Cells for Hydrogen Production", Journal of The Electrochemical Society, 161 (8), E3283-E3296, 2014.
10. Jian Jin, Karl Walczak, **Meenesh R. Singh**, Chris Karp, Nathan S. Lewis, and Chengxiang Xiang, "Experimental and Modeling/Simulation Evaluation of the Efficiency and Operational Performance of an Integrated, Membrane-Free, neutral pH Solar-Driven Water-Splitting System," Energy & Environmental Science, 7 (10), 3371-3380, 2014.
11. Christopher M. Evans, **Meenesh R. Singh**, Nathaniel A. Lynd, and Rachel A. Segalman, "Improving the Gas Barrier Properties of Nafion via Thermal Annealing: Evidence for Diffusion through Hydrophilic Channels and Matrix," Macromolecules, 48 (10), 3303-3309, 2015.
12. **Meenesh R. Singh**, Ezra L. Clark, and Alexis T. Bell, "Effects of Electrolyte, Catalyst, and Membrane Composition and Operating Conditions on the Performance of Solar-Driven Electrochemical Reduction of Carbon Dioxide," Physical Chemistry Chemical Physics, 17, 18924-18936, 2015 (**Cover Page**)

13. **Meenesh R. Singh**, Kimberly Papadantonakis, Chengxiang Xiang, and Nathan S. Lewis, "An Electrochemical Engineering Assessment of the Operational Conditions and Constraints for Solar-Driven Water-Splitting Systems at Near-Neutral pH," *Energy & Environmental Science*, 8, 2760-2767, 2015
14. Ezra L. Clark, **Meenesh R. Singh**, Youngkook Kwon, and Alexis T. Bell, "Differential Electrochemical Mass Spectrometer Cell Design for Online Quantification of the Products Produced during Electrochemical Reduction of CO₂," *Analytical Chemistry*, 87 (15), 8013-8020, 2015
15. **Meenesh R. Singh**, Ezra L. Clark, and Alexis T. Bell, "Thermodynamic and Achievable Efficiencies for Solar-Driven Electrochemical Reduction of Carbon Dioxide to Transportation Fuels," *Proceedings of the National Academy of Sciences*, 112 (45), E6111-E6118, 2015. (<http://spectrum.ieee.org/energywise/green-tech/solar/maximum-potential-for-turning-co2-into-fuel-using-solar-energy>)
16. **Meenesh R. Singh**, and Alexis T. Bell, "Design of an Artificial Photosynthetic System for Production of Alcohols in High Concentration from CO₂," *Energy & Environmental Science*, 9, 193-199, 2016. (<http://www.rsc.org/chemistryworld/2015/12/artificial-photosynthesis-ethanol-carbon-dioxide-fuel-production>)
17. Harri Ali-Loytty, Mary W. Louie, **Meenesh R. Singh**, Lin Li, Hernan G. Sanchez Casalongue, Hirohito Ogasawara, Ethan J. Crumlin, Zhi Liu, Alexis T. Bell, Anders Nilsson, and Daniel Friebe, "Ambient-Pressure XPS Study of a Ni-Fe Electrocatalyst for the Oxygen Evolution Reaction," *The Journal of Physical Chemistry C*, 120 (4), 2247-2253, 2016
18. Chengxiang Xiang, Adam Z. Weber, Shane Ardo, Alan D. Berger, YiKai Chen, Robert Coridan, Katherine T. Fountaine, Sophia Haussener, Shu Hu, Rui Liu, Nathan S. Lewis, Miguel A. Modestino, Matthew M. Shaner, **Meenesh R. Singh**, John C. Stevens, Ke Sun, Karl Walczak, "Modeling, Simulation and Implementation of Solar-Driven Water-Splitting Devices," *Angewandte Chemie International Edition*, 55, 2 -17, 2016 (**Invited Review**)
19. Peter Lobaccaro, **Meenesh R. Singh**, Ezra L. Clark, Youngkook Kwon, Alexis T. Bell, and Joel W. Ager III, "Effects of Temperature and Gas-Liquid Mass Transfer on the Operation of Small Electrochemical Cells for the Quantitative Evaluation of CO₂ Reduction Electrocatalysts," *Physical Chemistry Chemical Physics*, 18 (38), 26777 - 26785, 2016

From UIC

20. **Meenesh R. Singh**, Youngkook Kwon, Yanwei Lum, Joel W. Ager III, and Alexis T. Bell, "Hydrolysis of Electrolyte Cations Enhances the Electrochemical Reduction of CO₂ over Ag and Cu," *Journal of The American Chemical Society*, 138 (39), 13006 – 13012, 2016
21. **Meenesh R. Singh**, Chengxiang Xiang, and Nathan S. Lewis, "Evaluation of Flow Schemes for Near-Neutral Electrolytes in Solar-Fuels Generators," *Sustainable Energy & Fuels*, 1 (3), 458 - 466. (**Cover Page, 2017 Sustainable Fuels & Energy HOT Articles**)
22. **Meenesh R. Singh**, Jason D. Goodpaster, Adam Z. Weber, Martin Head-Gordon, and Alexis T. Bell, "Mechanistic Insights into Electrochemical Reduction of CO₂ over Ag using DFT and Transport Models," *Proceedings of the National Academy of Sciences*, 114 (42), E8812-E8821, 2017. (**News Coverage – R&D Mag, UIC Today, Science Daily, NewsWise, Phys.Org, and EurekaAlert!**)
23. Abhay Sane, Kevin Tangen, David Frim, **Meenesh R. Singh**, and Andreas Linninger, "Cellular Obstruction Clearance in Proximal Ventricular Catheters using Low-Voltage Joule Heating," *Transactions on Biomedical Engineering*, 2017

Manuscripts to be Submitted

24. Linh-Thao T. Chung, **Meenesh R. Singh**, and Alexis T. Bell, "ECO2R Simulator: A Web Application to Simulate Electrochemical Cells for Reduction of CO₂," *to be submitted to International Journal of Electrochemistry*
25. **Meenesh R. Singh**, "Graphical and Analytical Analysis of the Performance of Electrochemical Cells for Reduction of CO₂," *to be submitted*
26. Youngkook Kwon, **Meenesh R. Singh**, Francesca M. Toma, and Alexis T. Bell, "Role of Amine Grafted Carbon Nanotubes for Electrochemical CO₂ Reduction on Copper Nanoparticles," *to be submitted*

Manuscripts under Preparation

27. **Meenesh R. Singh**, “Aqueous versus Gaseous Phase Electrochemical Reduction of Carbon Dioxide,” *in preparation*
28. **Meenesh R. Singh**, “Direct Capture of Carbon Dioxide from Air using Water-driven Facilitated Transport,” *in preparation*
29. **Meenesh R. Singh**, Hsien-Hsin Tung, Shailendra Bordawekar and Doraiswami Ramkrishna, “Morphology Control through Cycles of Milling, Dissolution, and Growth,” *in preparation*
30. **Meenesh R. Singh**, “Mean-field Kinetic Theory of Self-Assembly of Rigid Molecules. Towards Kinetic Prediction of Polymorphs,” *in preparation*

Conference Proceedings

1. Jayanta Chakraborty*, **Meenesh Singh** and Doraiswami Ramkrishna, “Population Balance Modeling of Faceted Asymmetric Crystals”, International Symposium on Chemical Reaction Engineering (ISCRE 2010), Pennsylvania, June 13-16, 2010.
2. Jayanta Chakraborty, **Meenesh R. Singh*** and Doraiswami Ramkrishna, “Morphological population balance modeling of faceted crystals with large number of faces: the division of internal coordinate space into dynamic and invariant coordinates”, 4th International Conference on Population Balance Modeling, Berlin, Germany, September 15-17, 2010.
3. **Meenesh R. Singh***, Jayanta Chakraborty and Doraiswami Ramkrishna, “Population Balance Modeling of Morphology Distributions of Asymmetric Crystals,” Paper # 141g, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.
4. **Meenesh R. Singh***, Jayanta Chakraborty, Doraiswami Ramkrishna, Stephan X. M. Boerichter, Christian Borchert and Kai Sundmacher, “Morphological Measurements of Faceted Crystals Using Image Analysis,” Paper #668c, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.
5. **Meenesh R. Singh** and Doraiswami Ramkrishna*, “Towards Control of Crystal Shape. Crystallization and Dissolution”, Keynote Lecture, 18th International Symposium on Industrial Crystallization (ISIC 18), ETH Zurich, Switzerland, September 13-16, 2011.
6. **Meenesh R. Singh***, Christian Borchert, Kai Sundmacher and Doraiswami Ramkrishna, “Modeling of Morphology Transformations in Crystalline Materials: A Generalized Framework”, Paper #20c, AIChE Annual meeting, Minneapolis, Minnesota, October 16-21, 2011.
7. **Meenesh R. Singh***, Stephan X. M. Boerrigter, Christian Borchert, Kai Sundmacher and Doraiswami Ramkrishna, “Experimental Investigation of Crystal Shape Evolution During Growth and Dissolution”, Paper #548d, AIChE Annual meeting, Minneapolis, Minnesota, October 16-21, 2011.
8. **Meenesh R. Singh*** and Doraiswami Ramkrishna, “On Predicting Nuclei Shape Distribution,” AIChE Annual meeting, Pittsburgh, Pennsylvania, October 28th – November 2nd 2012
9. **Meenesh R. Singh*** and Doraiswami Ramkrishna, “The Morphological-Population Balance Model (M-PBM) Generator. Application to Additives Controlled Crystallization of KAP,” AIChE Annual meeting, Pittsburgh, Pennsylvania, October 28th – November 2nd 2012
10. **Meenesh R. Singh**, “Computational Screening of Crystal Morphologies from Crystal Structure,” Computational Science and Engineering Student Conference, SIAM, Purdue University, April 5th, 2013
11. **Meenesh R. Singh**, Conor D. Parks* and Doraiswami Ramkrishna, “A Kinetic Approach towards Polymorph Prediction. Identifying Nucleation Kernels Specific to a Polymorph,” 5th International Conference on Population Balance Modelling, Bangalore, India, September 11 – 13, 2013
12. **Meenesh R. Singh**, Conor Parks*, Hsien-Hsin Tung, Shailendra Bordawekar and Doraiswami Ramkrishna, “Polymorph Prediction: A Kinetic Approach,” AIChE Annual meeting, San Francisco, California, November 3rd – November 8th 2013
13. **Meenesh R. Singh***, Hsien-Hsin Tung, Shailendra Bordawekar and Doraiswami Ramkrishna, “Morphology Control through Cycles of Particle Breakage, Dissolution and Growth,” AIChE Annual meeting, San Francisco, California, November 3rd – November 8th 2013
14. **Meenesh R. Singh** and Doraiswami Ramkrishna, “Predicting dispersions in Crystallization Process,” AIChE Annual meeting, San Francisco, California, November 3rd – November 8th 2013

15. **Meenesh R. Singh***, John C. Stevens, and Adam Z. Weber, “Membrane-Encapsulated Solar Fuel Generators,” AIChE Annual meeting, Atlanta, Georgia, November 16th – November 21st 2014
16. **Meenesh R. Singh***, and Doraiswami Ramkrishna, “Identification of Polar Plots of Crystal Dissolution Rates using Hot-Stage Microscopy,” AIChE Annual meeting, Atlanta, Georgia, November 16th – November 21st 2014
17. **Meenesh R. Singh***, Christopher M. Evans, Chengxiang Xiang, Rachel A. Segalman, and Nathan S. Lewis, “Solar Fuel Generation at Near-Neutral pH Conditions: Operational Advantages and Disadvantages,” AIChE Annual meeting, Atlanta, Georgia, November 16th – November 21st 2014
18. Daniel J. Miller*, **Meenesh R. Singh**, Siwei Liang, Rachel A. Segalman, and Nathaniel A. Lynd, “Polymeric Moisture Swing Membranes for Carbon Dioxide Capture from Gas Mixtures,” AIChE Annual meeting, Atlanta, Georgia, November 16th – November 21st 2014
19. Siwei Liang*, **Meenesh R. Singh**, Daniel J. Miller, and Nathaniel A. Lynd, “Synthesis of Anion-Exchange Membranes for Applications in Artificial Photosynthesis and CO₂ Capture,” AIChE Annual meeting, Atlanta, Georgia, November 16th – November 21st 2014
20. Christopher M. Evans*, **Meenesh R. Singh**, Gabriel Sanoja, Miguel A. Modestino, Yanika Schneider, Nathaniel A. Lynd, and Rachel A. Segalman, “Ionic Conductivity and Gas Permeability of Polymerized Ionic Liquid Block Copolymer Membranes for Energy Applications,” AIChE Annual meeting, Atlanta, Georgia, November 16th – November 21st 2014
21. Ezra L. Clark*, **Meenesh R. Singh**, Youngkook Kwon, and Alexis T. Bell, “Design of an Electrochemical Cell for Investigating the CO₂ Reduction Reaction via Differential Electrochemical Mass Spectrometry,” AIChE Annual meeting, Atlanta, Georgia, November 16th – November 21st 2014
22. **Meenesh R. Singh***, “Materials and Systems Design for Healthcare and Energy Applications,” ,” AIChE Annual meeting, Atlanta, Georgia, November 16th – November 21st 2014
23. Doraiswami Ramkrishna*, **Meenesh R. Singh**, “Population Balances: Applications Ever on the Increase,” 64th Canadian Chemical Engineering Conference, Niagara Falls, New York, October 19th – October 22nd 2014
24. Chengxiang Xiang*, Yikai Chen, Karl Walczak, **Meenesh R. Singh**, Adam Z. Weber, Jian Jin, and Nathan S. Lewis, “Modeling/Simulation and Prototyping Development of Solar-Hydrogen Generators,” 227th ECS Meeting, Chicago, Illinois, May 24th – May 28th 2015
25. John Stevens, Chengxiang Xiang, **Meenesh R. Singh**, Yikai Chen, and Adam Z. Weber*, “Mathematical Modeling of Solar-Fuel Generators,” 228th ECS Meeting, Phoenix, Arizona, October 11th – 16th 2015
26. **Meenesh R. Singh***, Ezra L. Clark, and Alexis T. Bell, “Solar-driven Electrochemical Reduction of Carbon Dioxide: Materials Selection, Operating Conditions, and Cell Design,” AIChE Annual meeting, Salt Lake City, Utah, November 8th – 13th, 2015
27. **Meenesh R. Singh***, and Alexis T. Bell, “Thermodynamic and Practical Efficiencies of Solar-driven Electrochemical Conversion of Water and Carbon Dioxide to Transportation Fuels,” AIChE Annual meeting, Salt Lake City, Utah, November 8th – 13th, 2015
28. Ezra L. Clark*, **Meenesh R. Singh**, Youngkook Kwon, and Alexis T. Bell, “Online Quantification of the Electrochemical CO₂ Reduction Reaction via a Novel Differential Electrochemical Mass Spectrometer Cell Design,” AIChE Annual meeting, Salt Lake City, Utah, November 8th – 13th, 2015
29. Ezra L. Clark*, Youngkook Kwon, Mu-Jeng Cheng, Peter Lobaccaro, Yanwei Lum, **Meenesh R. Singh**, and Alexis T. Bell, Rational Design of a Metallic Electrocatalyst for the Selective Reduction of CO₂ to C₂+ Oxygenates,” AIChE Annual meeting, Salt Lake City, Utah, November 8th – 13th, 2015
30. Katie Chen, **Meenesh R. Singh**, Ke Sun, Shu Hu, Adam Weber, Nathan S. Lewis, and Chengxiang Xiang*, “Modeling and Simulation of Solar-Fuel Generators,” AIChE Annual meeting, Salt Lake City, Utah, November 8th – 13th, 2015
31. **Meenesh R. Singh***, Chengxiang Xiang, Kimberly Papadantonakis, and Nathan Lewis, “Solar-driven Electrochemical Water-Splitting at Near Neutral pH Conditions – Operating Strategies and their Limitations,” AIChE Annual meeting, Salt Lake City, Utah, November 8th – 13th, 2015
32. **Meenesh R. Singh***, “Materials and Systems Engineering for Healthcare and Energy Applications – From Discovery to Design,” AIChE Annual meeting, Salt Lake City, Utah, November 8th – 13th, 2015
33. **Meenesh R. Singh***, Youngkook Kwon, Yanwei Lum, Joel W. Ager III, and Alexis T. Bell “How do Electrolyte Cations Affect Activity and Selectivity of the Electrochemical Reduction of CO₂ over Ag and Cu?,” AIChE Annual meeting, San Francisco, California, November 13th – 18th, 2016

34. **Meenesh R. Singh***, Jason D. Goodpaster, Adam Z. Weber, Martin Head-Gordon and Alexis T. Bell “Mechanistic Insights into the Electrochemical Reduction of CO₂ over Ag using an Integrated Transport-DFT-Microkinetic Model,” AIChE Annual meeting, San Francisco, California, November 13th – 18th, 2016
35. **Meenesh R. Singh***, and Alexis T. Bell “Achievable Alcohol Concentrations and Membrane Requirements for Artificial Photosynthetic System,” AIChE Annual meeting, San Francisco, California, November 13th – 18th, 2016
36. Peter Lobaccaro*, **Meenesh R. Singh**, Ezra L. Clark, Youngkook Kwon, Alexis T. Bell, and Joel W. Ager III, “Effects of Temperature and Gas-Liquid Mass Transfer on the Operation of Small Electrochemical Cells for the Quantitative Evaluation of CO₂ Reduction Electrocatalysts,” AIChE Annual meeting, San Francisco, California, November 13th – 18th, 2016
37. **Meenesh R. Singh***, Yanwei Lum, Ezra L. Clark, Joel W. Ager III, and Alexis T. Bell, “Optimal Pattern of Bimetallic Electrocatalysts for Efficient Conversion of Water and Carbon Dioxide to Hydrocarbons and Oxygenates,” AIChE Annual meeting, San Francisco, California, November 13th – 18th, 2016
38. Anish Dighe*, and **Meenesh R. Singh**, “Mathematical Modeling and Simulation of Nucleation and Growth of Crystalline Polymorphs,” AIChE Midwest Regional Conference, Chicago, Illinois, February 28th – March 1st, 2017
39. Aditya Prajapati*, and **Meenesh R. Singh**, “Efficiency of Artificial Photosynthetic Devices for Integrated Carbon Capture and Reduction,” AIChE Midwest Regional Conference, Chicago, Illinois, February 28th – March 1st, 2017
40. Paria Coliaie*, and **Meenesh R. Singh**, “Designing a Microfluidic Platform for High-Throughput Screening of Pharmaceutical Polymorphs,” AIChE Midwest Regional Conference, Chicago, Illinois, February 28th – March 1st, 2017
41. James Fell*, Anish V. Dighe, and **Meenesh R. Singh**, “Multiscale, Multiphysics, Mechanistic Model for Computation of Face-Specific Growth Rates,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
42. Emily C. Yolo*, Aditya Prajapati, and **Meenesh R. Singh**, “Solar-Driven Electrochemical Desalination of Seawater,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
43. Anish V. Dighe*, and **Meenesh R. Singh**, “A Multiscale Computational Method for Prediction of Polymorphs,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
44. Grzegorz Kokoszka*, Aditya Prajapati, and **Meenesh R. Singh**, “Transport Analysis of an Integrated Artificial Photosynthetic System for Direct Capture and Reduction of CO₂ from Air,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
45. Aditya Prajapati, and **Meenesh R. Singh**, “Measurement of Intrinsic Activity of Electrocatalytic Reduction of CO₂ over Cu,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
46. Anish V. Dighe*, and **Meenesh R. Singh**, “Calculation of Free Energy Barriers for Attachment of Molecules during Crystal Growth and Nucleation,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
47. Aditya Prajapati, and **Meenesh R. Singh**, “Efficiency Limits of an Integrated Solar-Driven CO₂ Capture and Reduction Systems,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
48. Paria Coliaie*, and **Meenesh R. Singh**, “Multiphysics Modeling and Simulation of Microfluidic Platforms for Screening of Pharmaceutical Polymorphs,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
49. Paria Coliaie*, and **Meenesh R. Singh**, “A Novel Microfluidic Platform for Screening of Pharmaceutical Polymorphs under Hydrodynamically-Controlled Crystallization Conditions,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
50. Rosanna Granata*, Aditya Prajapati, and **Meenesh R. Singh**, “Design of a 400 MW Carbon-Neutral, Coal-Fired Power Plant with Integration of Waste Heat and Solar Energy,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
51. **Meenesh R. Singh*** and Andreas Linninger, “Mathematical Modeling and Simulation of Magnetophoresis. Application to Drug Delivery Using Magnetic-Field,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017

* Indicates oral presenter of the paper

Invited Talks

1. **Meenesh R. Singh** and Doraiswami Ramkrishna*, “Towards Control of Crystallization Processes,” Global Pharmaceutical R&D, Abbott Laboratories, North Chicago, Illinois, August 7th, 2012
2. **Meenesh R. Singh***, “Crystal Morphologies: Targeting, Screening, Control and Measurement,” Department of Chemical and Biomolecular Engineering, University of California Berkeley, Berkeley, California, October 25th, 2012
3. **Meenesh R. Singh***, “Screening Crystal Morphologies from Crystal Structure,” ACS I&EC Graduate Award Symposia, 2013 (Declined)
4. **Meenesh R. Singh***, “A Journey through Crystal Forests,” Faculty Lectureship Award, Purdue University, 2014
5. **Meenesh R. Singh***, “Materials and System Engineering for Energy and Healthcare Applications – From Discovery to Design,” Department of Chemical Engineering, University of Illinois at Chicago, 2016

* Indicates oral presenter

Editorial Duties

1. Lead Guest Editor, Special Issue: “Electrochemical Reduction of Carbon Dioxide,” International Journal of Electrochemistry, 2016

Conference Session Organizer

1. Co-Chair, “Modeling and Control of Crystallization,” AIChE Annual meeting, Salt Lake City, Utah, November 8th – 13th, 2015
2. Co-Chair, “Fundamentals of Hydrogen Production,” AIChE Annual meeting, Salt Lake City, Utah, November 8th – 13th, 2015
3. Chair, “Solid Form Selection: Cocrystals, Salts, Solvates, Polymorphs, and Beyond,” AIChE Annual meeting, San Francisco, California, November 13th – 18th, 2016
4. Co-Chair, “Electrocatalysis and Photoelectrocatalysis,” AIChE Annual meeting, San Francisco, California, November 13th – 18th, 2016
5. Chair, “Electrocatalysis and Photoelectrocatalysis,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
6. Co-Chair, “Rational Design of Catalysts,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
7. Chair, “Modeling and Control of Crystallization,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
8. Co-Chair, “Solid Form Selection: Cocrystals, Salts, Solvates, Polymorphs, and Beyond,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
9. Co-Chair, “Amorphous and Crystalline Particle Engineering in Pharmaceuticals and Other Novel Materials,” AIChE Annual meeting, Minneapolis, Minnesota, October 29th – November 3rd, 2017
10. Chair, “Poster Session,” AIChE Midwest Regional Conference, Chicago, Illinois, February 28th – March 1st, 2017

Software Developed

1. *CrystalShape*: A software to visualize 3D shape of crystals.
<https://engineering.purdue.edu/~drops/software/CrystalShape.zip>
2. *CrystalTomogram*: A software to construct crystal morphology from tomographic images,
<https://engineering.purdue.edu/~drops/software/CrystalTomogram.zip>

3. *MorphologyDomain*: A software to visualize accessible crystal morphologies under given operating conditions. <https://engineering.purdue.edu/~drops/software/MorphologyDomain.zip>
4. *CrystalPolar*: A software to obtain growth/dissolution rates of all crystal faces from the dynamic images of crystals. <https://engineering.purdue.edu/~drops/software/CrystalPolar.zip>
5. *ECO2R Simulator*: Web-based software to simulate electrochemical cell for CO₂ reduction. jcap-n-simulator-1.lbl.gov:2036

Teaching Activities

Instructor , CHE 445 Mathematical Methods in Chemical Engineering, UIC	<i>Aug 2017 – Dec 2017</i>
Instructor , CHE 445 Mathematical Methods in Chemical Engineering, UIC	<i>Aug 2016 – Dec 2016</i>
Teaching Assistant , Applied Mathematics in Chemical Engineering, Purdue University	<i>Aug 2011 – Dec 2011</i>
Teaching Assistant , Transport Phenomena, Purdue University	<i>Aug 2009 – Dec 2009</i>
Teaching Assistant , Data Analysis and Interpretation, IIT-B	<i>Jan 2008 – May 2008</i>
Teaching Assistant , Computational Methods in Chemical Engineering, IIT-B	<i>Aug 2007 – Dec 2007</i>
Teaching Assistant , Chemical Engineering Thermodynamics-I, IIT-B	<i>Jan 2007 – May 2007</i>

Mentoring Activities

Ph. D. Students

1. Aditya Prajapati, “Artificial Photosynthesis for Integrated Carbon Capture and Reduction,” Fall 2016 - Present
2. Paria Coliaie, “Microfluidic Platform for High-Throughput Screening of Pharmaceuticals,” Fall 2016 - Present

M. S. Students

3. Anish Dighe, “Multiscale Modeling and Simulation for Crystal Structure Prediction,” Fall 2016 – Present
4. Victoria Smith, “Electrochemical Oxidation of Methane,” Summer 2017 - Present
5. Ragavendra Hari, “Population Balance Modeling of Novel Particulate Processes,” Summer 2017 - Present

B. S. Students

1. James Fell, “Modeling of Crystal Growth Rates,” Fall 2016 – Present
2. Emily Yolo, “Design of Solar-Driven Electrochemical Desalinators,” Fall 2016 – Present
3. Grzegorz Kokoszka, “Membrane-Electrode-Assembly for Carbon Capture and Reduction,” Fall 2016 – Present
4. Sanjana Epari, “Mechanisms of Bone Remineralization,” Spring 2016 – Present
5. Rosanna Granata, “Design of 500 MW Carbon-Neutral Power Plant,” Spring 2016 - Present

Reviewing Experience

Reviewed research articles from journals such as Nature Comm., EES, CES, AIChE, JCIS, I&EC, CGD, IOP, CHERD, JAS, PPSC and CET. I have reviewed over 45 research articles, 1 PhD thesis and 2 research proposals.

Reviewer: Chemical Engineering Science, Crystal Growth & Design, Acta Crystallographica, Nature Communication, Computers and Chemical Engineering, and Journal of Physical Chemistry Letters.