ANUSHREE CHATTERJEE

Department of Chemical and Biological Engineering
University of Colorado at Boulder
3415 Colorado Avenue, 596 UCB,
Boulder. CO 80303

Email: chatterjee@colorado.edu
Phone: 303-735-6586
Fax: 303-492-8425

EDUCATION

2011 **Doctor of Philosophy**, Chemical Engineering, University of Minnesota (UMN)
Advisor(s): Wei-Shou Hu and Yiannis N. Kaznessis

2006 **Master of Technology**, Chemical Engineering, Indian Institute of Technology Delhi
Advisor: Barun K. Guha

2006 **Bachelor of Technology**, Chemical Engineering, Indian Institute of Technology Delhi (I.I.T Delhi)

PROFESSIONAL POSITIONS

2013-present **Assistant Professor,** Department of Chemical and Biological Engineering, University of Colorado at Boulder

2013-present **Affiliate,** Renewable and Sustainable Energy Institute (RASEI), University of Colorado at Boulder

2011-2012 **Postdoctoral Fellow**, Theoretical Biology and Biophysics, Center for Nonlinear Studies, Los Alamos National Laboratory (LANL)
Advisor: Alan S. Perelson

OTHER EXPERIENCE AND PROFESSIONAL ASSOCIATIONS

2014-present Session Chair, *AIChE Annual Meeting* 2014

2013-present Editorial Board, Journal of Gene therapy

2011-present Reviewer for Proceedings of National Academy of Sciences, PLoS ONE, PLoS Computational Biology, Antiviral therapy, Chemical Engineering Science, Current Opinion in Chemical Engineering

2010-present Member, American Institute of Chemical Engineers

2009-present Member, American Society of Microbiology

2008-present Society of Women Engineers

AWARDS AND HONORS

2011-2012 Center for Nonlinear Studies Postdoctoral Fellow, LANL

2010 Doctoral Dissertation Fellowship, UMN

2009	Microbial and Plant Genomics Institute Grant award, UMN
2006	Usha Kumar Fellowship, UMN
2006	Suman-Upma Gupta Memorial Gold medal, I.I.T Delhi
2005	Institute Scholarship for Master of Technology, I.I.T Delhi
2004	First prize in Technical paper session, *TRYST*, New Delhi
2003	Summer Undergraduate Research Award, I.I.T. Delhi
2001-2005	Institute Merit Scholarship, I.I.T Delhi

TEACHING EXPERIENCE

- **Teaching Instructor (University of Colorado, Boulder)**
  - CHEN 5210: Transport phenomena (graduate level) (Spring 2013, 2014)
- **Teaching Instructor (University of Minnesota)**
  - CHEN 8754, Systems Biology (graduate level), Spring 2008
  - Cellular Bioprocess Technology short course**,** Summers 2007-2010
  - National Institute of Health Trainees workshop, Spring 2010, Summer 2011

PEER-REVIEWED PUBLICATIONS

(**# indicates Equal contribution and * indicates corresponding author**)

1. Keesha E. Erickson, Ryan T Gill, and Anushree Chatterjee*, "***Constraint Modification provides insight for design of ethylene production in Escherichia coli***." (In preparation).

2. Colleen M. Courtney, Anushree Chatterjee*, "***Antisense inhibition of beta-lactamase activity in Escherichia coli.***" (In preparation).

3. Usha S. Varanasi, Colleen M. Courtney, and Anushree Chatterjee*, ***"Higher order biological logic gates using engineered antisense transcription."*** (In preparation).

4. Colleen M. Courtney, and Anushree Chatterjee*, "***cis-antisense RNA and transcriptional interference: coupled layers of regulation.***" **Journal of Gene Therapy (Accepted).**

5. Josep Casamada Ribot, Anushree Chatterjee*, and Prashant Nagpal*, "***Third-generation sequencing using STM-STS for fast detection of single DNA molecule and single nucleotide modifications."*** **(Under review).**

6. Samuel Goodman, Vivek Singh, Hyunwoo Noh, Josep Casamada Ribot, Anushree Chatterjee, Jennifer N. Cha, Prashant Nagpal*, ***"Hopping transport between nucleic acid sequences and exciton shelves for DNA-quantum dot electronics."*** **(Under review)**.

7. Laetitia Canini#, Anushree Chatterjee#, Jeremie Guedj, Annabelle Lemenuel-Diot, Patrick F. Smith and Alan S. Perelson*,***" A pharmacokinetic/viral kinetic model to evaluate treatment of chronic hepatitis C virus with danoprevir."*** **Antimicrobial agents and Chemotherapy (Under review).**

8. Che-Chi Shu, Anushree Chatterjee, Wei-Shou Hu, and Doraiswami Ramkrishna*, ***"Role of intracellular stochasticity in biofilm growth. Insights from population balance modeling."*** **PLoS ONE (In press).**

9. Anushree Chatterjee#, Laura C. Cook#, Che-Chi Shu, Yuching Chen, Dawn Manias, Doraiswami Ramkrishna, Gary M. Dunny and Wei-Shou Hu* (2013), ***"Antagonistic self-sensing and mate-sensing signaling controls antibiotic-resistance transfer."*** **Proceedings of National Academy of Sciences**, 110(17), 7086-7090.

10. Anushree Chatterjee, Patrick F. Smith and Alan S. Perelson* (2013), ***"Hepatitis C viral kinetics: the past, present and future."*** **Clinics in Liver Disease,** 17 (1): 13-26.

11. Anushree Chatterjee#, Jeremie Guedj# and Alan S. Perelson* (2012), "***Mathematical modeling of HCV infection: what can it teach us in the Direct Antiviral Agents era?"*** **Antiviral Therapy,** 17 (6 Pt B): 1171-1182.

12. Anushree Chatterjee, Christopher M. Johnson, Che-Chi Shu, Yiannis N. Kaznessis, Doraiswami Ramkrishna, Gary M. Dunny and Wei-Shou Hu* (2011). ***"Convergent transcription confers a bistable switch in Enterococcus faecalis conjugation."*** **Proceedings of the National Academy of Sciences,** 108: 9721-9726.

    Selected and evaluated the Faculty of 1000 (F1000) as top 2% of published articles in biology and medicine (http://f1000.com/11331957), Featured in "University of Minnesota News." http://www1.umn.edu/news/features/2011/UR_CONTENT_343890.html , Featured in Hutchinson Leader, Minnesota, (http://www.hutchinsonleader.com/view/full_story/14491407/article-U-of-M-researchers-to-pathogenic-bacteria--Resistance-is-futile?).

13. Anushree Chatterjee, Laurie Drews, Sarika Mehra, Eriko Takano, Yiannis N. Kaznessis and Wei-Shou Hu* (2011), "***Convergent transcription in the butyrolactone regulon in Streptomyces coelicolor confers a bistable genetic switch for antibiotic biosynthesis.***" **PLoS ONE,** 6:e21974.

14. Christopher M Johnson, Heather Haeming, Anushree Chatterjee, Wei-Shou Hu, Keith E. Weaver, and Gary M. Dunny* (2011), ***"RNA-mediated reciprocal regulation between two bacterial operons is RNAse III dependent"*** **mBio,** 2(5): e00189-11.

15. Che-Chi Shu, Anushree Chatterjee, Gary M. Dunny, Wei-Shou Hu and Doraiswami Ramkrishna* (2011), "***Bistability versus Bimodal Distributions in Gene Regulatory Processes from Population Balance Model.***" **PLoS Computational Biology,** 7(8):e1002140.

16. Laura CC Cook, Anushree Chatterjee, Aaron Barnes, Jeremy Yarwood, Wei-Shou Hu and Gary M. Dunny* (2011)***, "Biofilm growth alters regulation of conjugation by a bacterial pheromone."*** **Molecular Microbiology,** 81(6), 1499-1510.

17. Che-Chi Shu, Anushree Chatterjee, Wei-Shou Hu and Doraiswami Ramkrishna* (2012), "***Modeling of Gene regulatory processes by Population mediated Signaling. New applications of Population balances."*** **Chemical Engineering Science,** 70: 188-199.

18. Anushree Chatterjee, Yiannis N. Kaznessis and Wei-Shou Hu* (2008): "***Tweaking biological switches through a better understanding of bistability behavior.***" **Current Opinion in Biotechnology, Tissue, cell and pathway engineering**, 19:475-481

BOOK CHAPTERS

- Anushree Chatterjee*, ***"The antibiotic resistance game: genetic switches controlling antibiotic resistance transfer,"*** in ***"Detection and Characterization of Antibiotic resistance"***, Edited by and Dr. Jian Song and Dr. Murray Wolinsky (Springer-Verlag, New York).

PATENTS

- Nagpal P., Chatterjee A.**,** Ribot J.C., Provisional Patent Application Number: 61/877,634, "***Third generation sequencing using STM-STS for fast detection of single DNA molecules and single nucleotide modifications***"

- Chatterjee A. and Bhaskarwar, A.N., **Patent no. 2427/DEL/2007**, "***A process of preparation of pollution preventing temperature sensitive lithographic ink composition and product thereof***".

INVITED* AND CONTRIBUTED PRESENTATIONS *(presenting/first/corresponding author only)*

- Erickson K.E., and Chatterjee A., **"*Constrictor: Flux Balance Analysis Constraint Modification Provides Insight for Design of Biochemical Networks*,**" APS 2014, Denver, CO.
- Erickson K.E., and Chatterjee A., **"*Towards a tolerance toolkit: Gene expression signatures enabling the emergence of resistant bacterial straisns*,**" APS 2014, Denver, CO.
- Courtney C.M.., and Chatterjee A., **"*Re-sensitizing drug-resistant bacteria to antibiotics Antisense therapeutics*,**" APS 2014, Denver, CO.
- Courtney C.M.., and Chatterjee A., **"*An in vivo and in silico approach to study cis-antisense: a short cut to higher order response*,**" APS 2014, Denver, CO.
- Casamada Ribot, J, Chatterjee A., and Nagpal P., **"*Quantum-Sequencing: Biophysics of quantum tunneling through nucleic acids*,**" APS 2014, Denver, CO.
- Casamada Ribot, J, Chatterjee A., and Nagpal P., **"*Quantum-Sequencing: Fast electronic single DNA molecule sequencing*,**" APS 2014, Denver, CO.
- Erickson K.E., and Chatterjee A., **"*Constrictor: Flux Balance Analysis Constraint Modification Provides Insight for Design of Biochemical Networks*,**" AIChE 2013, San Francisco, CA.
- Casamada Ribot, J., Nagpal, P., and Chatterjee A., ***"Nano-Biosensors for Fast, High-Throughput Detection of Antimicrobial Resistance,"*** AIChE 2013, San Francisco, CA.
- *Chatterjee A., "***Using synthetic and systems biology approaches for bioenergy applications.",*** 2013, Colorado Center for bio refining and biofuels, University of Colorado, Boulder, CO *(Invited talk)*.
- *Chatterjee A., ***"Discovering novel drug targets to prevent antibiotic resistance transfer in bacteria using systems biology approaches,"*** 2012, Department of Chemical and Biological Engineering, University of Colorado, Boulder, CO. *(Invited talk)*
- *Chatterjee A., ***"Discovering novel drug targets to prevent antibiotic resistance transfer in bacteria using systems biology approaches,"*** 2012, Department of Chemical and Biomolecular Engineering, University of Illinois, Urban-Champaign, IL. *(Invited talk)*
- *Chatterjee A., ***"Discovering novel drug targets to prevent antibiotic resistance transfer in bacteria using systems biology approaches,"*** 2012, Department of Chemical and Biomolecular Engineering, Tufts University, Boston, MA. *(Invited talk)*
- Chatterjee A., Cook L.C., Shu C-C, Johnson C.M., Kaznessis Y.N., Ramkrishna D., Dunny G.M. and Hu W-S, ***"The Antibiotic Resistance game: The Genetic Regulation of antibiotic resistance transfer in Enterococcus faecalis,"*** AIChE 2011, Minneapolis, MN.

- *Chatterjee A., ***"The antibiotic resistance game in Enterococcus faecalis: A bistable genetic switch controls antibiotic resistance transfer",*** 2012, Bio-Sciences Division, Los Alamos National Laboratory, Los Alamos, NM. *(Invited talk)*
- *Chatterjee A., ***"The antibiotic resistance game in Enterococcus faecalis: A bistable genetic switch controls antibiotic resistance transfer",*** 2011, Center for Non-linear Studies, Los Alamos National Laboratory, Los Alamos, NM. *(Invited talk)*
- *Chatterjee A., ***"Convergent transcription confers a bistable switch during conjugative transfer of drug resistance in Enterococcus faecalis"***, 2011, Theoretical Biology and Biophysics division, Los Alamos National Laboratory, Los Alamos, NM. ***(Invited talk)***
- Chatterjee A., Johnson C.M., Shu C-C, Ramkrishna D., Hu W-S and Dunny G.M., ***"Turning off the bistable switch controlling Enterococcus faecalis conjugation"***, Phage Meeting 2011, Madison, WI.
- Chatterjee A., Johnson C.M., Shu C-C, Kaznessis Y.N., Doraiswami R., Dunny G.M., Hu W-S, "***A Bistable Switch Controls Drug Resistance Transfer in Enterococcus Faecalis Via Antisense RNA, Transcriptional Interference: An in Silico and In Vivo Approach***", AIChE 2010, Salt Lake City, UT.
- Chatterjee A., Hu W-S, "***Modeling Regulatory Role of Transcriptional Interference in Conjugational Transfer of Drug Resistance in Enterococcus faecalis***", Life Science Alley, 2009, Minneapolis, MN.
- *Chatterjee A., Hu W-S, "***Antisense RNA, Transcriptional Inference and Genetic Switch: Train wreck or noise filter?***", AIChE General Meeting 2009, Nashville, TN. *(Invited Talk)*
- Chatterjee A., "***Modeling Regulatory Role of Transcriptional Interference in Conjugational Transfer of Drug Resistance in Enterococcus faecalis***", Cellular Bioprocess Tech. short course, 2009, Minneapolis, MN.
- *Chatterjee A., Kaznessis Y.N., Dunny G.M. and Hu W-S, "***Engineering Gene Regulation by Tweaking Transcriptional Interference***", 8th World Congress for Chemical Engineering, 2009, Montreal, Canada. ***(Invited Talk)***
- Chatterjee A., Johnson C., Kaznessis Y.N., Dunny G.M. and Hu W-S, "***Modeling Regulatory Role of Transcriptional Interference in Conjugational Transfer of Drug Resistance in Enterococcus faecalis***", American Society of Microbiology, General Meeting, 2009, Philadelphia.
- Chatterjee A., Dunny G.M., Hu W-S "***Transcriptional interference and Antisense regulation controlling conjugation switch in Enterococcus faecalis***", Microbial and Genomics Institute Annual Retreat, 2009, Minneapolis, MN.
- Chatterjee A., Castro M., "***Modeling of ScbA/ScbR system in Streptomyces coelicolor***", Cellular Bioprocess Technology short course, 2007, Minneapolis, MN.
- Chatterjee A., Guha, B.K., "***Membrane Contactors for gas-liquid contacting***", 58th Annual IIChE meet, IIT Delhi, 2005.

- Chatterjee A., Bhaskarwar A.N., "***Development of a Novel Temperature Sensitive Ink***", Industrial Research and Development Conference, IIT Delhi, 2004.
- Chatterjee A., Bhaskarwar A.N., "***Pollution preventing Temperature Sensitive Lithographic Ink***", TRYST 2004, IIT Delhi.

CURRENT STUDENTS AND RESEARCH ASSOCIATES SUPPORTED (University of Colorado)

- **Research associate/post-doctoral fellows**
  - Usha S Varanasi, 2013-present

- **Graduate students**
  - Colleen M Courtney, Dec 2012-present
  - Keesha E Erickson, Dec 2012-present
  - Josep Casamada Ribot, Dec 2012-present
  - Peter B. Otoupal, Sep 2013-present
  - Antoni Escalas Bordoy, Oct 2013-present
  - Lynn Sanford, (rotation student), 2014-present

- **Undergraduate students supervised**
  - Kyle Williams, 2013-present
  - Shakira Ramesh Govind, 2013-present
  - Austin Charles Potthoff, 2013-present
  - Christina Danielle Nuss-Brill, 2013-present
  - Kyle Anderson, 2013
  - Peyton Elizabeth Domeier, 2013

- **High-School students**
  - Logan Collins, Fairview High School, 2013-present