

# ANUBHAV TRIPATHI

Assistant Professor of Engineering and of Division of Biology and Medicine (courtesy)

Division of Engineering, Brown University, Box D, Providence, RI 02912

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## Education

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Ph. D.	City University of New York, Chemical Engineering	1998
	“Experimental investigations of shear induced particle migrations in concentrated suspensions undergoing shear” (Advisor: Professor Andreas Acrivos)	
M.S.	Indian Institute of Technology, Kanpur, Chemical Engineering	1993
B.S.	Indian Institute of Technology, Kanpur, Chemical Engineering	1991

## Professional Experience

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<b>Associate Professor of Engineering</b>	July 1, 2009 to Present
Brown University, Providence RI	
<i>Courtesy Faculty Appointment in the Division of Biology and Medical Sciences</i>	
<b>Assistant Professor of Engineering</b>	Sept. 1, 2003 - June 30, 2009
Brown University, Providence RI	
<i>Courtesy Faculty Appointment in the Division of Biology and Medical Sciences</i>	
<b>Co- Director, Center of Biomedical Engineering</b>	July. 1, 2009 to Present
Brown University, Providence RI	
<b>Concentration co-advisor, Undergraduate Biomedical Engineering</b>	Oct. 1, 2009 to Present
Brown University, Providence	
<b>Program chair of Undergraduate Studies in Biomedical Engineering</b>	Sept. 1, 2007 to Oct. 2009
Brown University, Providence RI	
<b>Founder, Gauge Microfluidics</b>	June 2006 to Present
Northborough, MA	
Development of microfluidic pressure driven pumps.	
Licensing agreement with Harvard Apparatus, MA.	
<b>Research Scientist/Engineer</b>	Dec. 2000 – Aug. 2003
Caliper LifeSciences (formerly Caliper Technologies), Mountain View, CA	
<b>Part Time Lecturer, Graduate Fluid Mechanics</b>	Aug. 2001 – Dec. 2001
San Jose State University, Chemical Engineering Dept., San Jose CA	
<b>Research Scientist, Mechanical Engineering Dept.</b>	Dec.1998 – Nov. 2000
Massachusetts Institute of Technology, Cambridge, MA	
(Advisor: Professor Gareth McKinley)	
<b>Postdoctoral Research Associate</b>	Aug.1998 – Nov. 1998
Levich Institute, City College of New York, New York	
(Advisor: Professor Andreas Acrivos and Professor Boris Khusid (NJIT))	

## Peer-Reviewed Publications

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### Manuscripts (under review)

1. Laulicht B., Tripathi, A., Schlageter, V., Kucera, P. and Mathiowitz, E., "Understanding Gastric Forces Calculated from High Resolution Pill Tracking Data Journal of Controlled Release, 2009 (*manuscript submitted*)
2. Liu, Y., Li, G., Tripathi, A. and Tang, J. X., "Force profile of an optical trap probed by swimming bacteria and micron sized beads" Applied Physical Letters, 2009 (*manuscript submitted*)
3. Seward, M., Larsen, M.U., Luryi, A., Jones, A., Shapley, N. C., and Tripathi, A. "Improved Antimicrobial Potency through Synergistic Action of Microparticulate Chitosan and Short Sustained Electric Field", Biophysical Journal, 2009 (*manuscript submitted*)
4. Kerby MB, Sarma, A., Patel M, Artenstein A, Opal S, Tripathi A, 'Early termination of human H5 influenza in vitro RNA synthesis', Analytical Biochemistry, 2009 (*manuscript submitted*)

### Manuscripts (accepted)

5. Qian, B., Loureiro, M., Gagnon, D. Tripathi, A., and Breuer, K. S., "Microscale droplet deposition on a hydrophobic surface using a retreating syringe" Physics Review Letters, 2009, 102, 164502.
6. McCalla, S., Luryi, A., and Tripathi, A. "Steric effects and mass transfer limitations surrounding amplification reactions on immobilized long and clinically relevant DNA templates" Langmuir, 2009, 25(11), 6168.
7. Kerby, M. B., Urban, J. C., Mouallem, L., Tripathi, A., "Human serum inhibits adhesion of microspheres targeted to endothelial inflammatory ligands", Applied Biochemistry and Biotechnology, 2009, 159(1), 208.
8. Laulicht B., Cheifetz, P., Tripathi, A. and Mathiowitz, E., "Are *in vivo* Gastric Bioadhesive Forces Accurately Reflected by *in vitro* Experiments?" Journal of Controlled Release, 2009, 134(2), 103.
9. Larsen, M.U., Seward, M., Tripathi, A. and Shapley, N. C., "Biocompatible nanoparticles trigger rapid bacteria clustering", Biotechnology Progress, 2009, 24(4), 1094.
10. Lee, J., Jha, A. K., Bose, A. and Tripathi, A. "Exploration of new transient amphiphilic structures using a microfluidic chip integrated with cryo-TEM" Langmuir, 2008, 28, 12738. Highlighted in *Lab on a Chip*, 15-16 Vol. 9 2009
11. Patel, M. S.; Kerby, M.; Mouallem, L.; Chauhan, A.; Tripathi, A., A novel method of separating proteins for applications in biomarker characterization. *Journal of Investigative Medicine* **2008**, 56, (1), 181-181.
12. Holt B., Tripathi, A., Clifton, R. J. and Morgan, J. "Understanding viscoelastic response of the human skin for percutaneous medical device development" *J. of Biomechanics* 2008, 41(12) 2689-2695.
13. Bryan, L., Mathiowitz, E. and Tripathi A. "Non-aqueous synthesis of biodegradable nanospheres via microfluidics" Langmuir, 2008, 24(19); 10786-10790
14. Jha, A. K., Lee, J., Tripathi, A. and Bose, A. "Three dimensional confinement related changes to mixed surfactant systems" Langmuir, 2008, 24(12); 6013-6017.
15. Jauzi, M., Kerby MB, Tripathi, A. and Xu, J., 'Measurements of conformation dependent activity of single biomolecules using nanoneedles' Langmuir, 2008 24(19); 10786-10790

16. Lee, J., Kulla, E., Tripathi, A. and Chauhan A., "Dispersion of DNA Plugs Undergoing Microfluidic PCR", *Physics of Fluids*, 2008, 20, 093601
17. Oliver G., Simpson C, Kerby MB, Chauhan A, Tripathi A, "Electrophoretic migration of proteins in polymer solutions", *Electrophoresis* 2007, 29(5) 1152
18. Lee, J., Lim, K., Tripathi, A. and Palmore G. T. R., "Optimization of Microfluidic Biofuel Cells Using Transport Principles", *Anal. Chem.*, 2007, **79** (19), 7301 -7307
19. Lee, J., and Tripathi, A. "Measurements of label free protein concentration and conformational changes using a microfluidics UV LED method", *Biotech. Progress*, 2007, 23, 1506.
20. Kerby M. B., Freeman, S., Prachanronarong, K. Artenstein, A. W., Opal, S. M. and Tripathi A. "Detection of pathogenic H5 influenza using molecular probes in an isothermal microfluidic platform", *Journal of Medical Diagnostics*, 2007, 10(3) 225.
21. Lee, J. Bose, A. and Tripathi, A. "Exploration of Phase Behavior in Surfactant Systems in Microchannels" *Langmuir*, 2006, 22(26), 11412.
22. Kerby M. B., Legge R.L., Tripathi A., "On Measurements of Kinetic Parameters in a Microfluidic Reactor" *Analytical Chemistry*, 2006, 78, (24), 8273-8280
23. Kerby, M. B., Lee, J., Ziperstein, J., and Tripathi, A. "Kinetic measurements of protein conformation in a microchip" *Biotech. Prog.*, 2006, 22(5) 1416.
24. Tripathi, A., McKinley, G.H. and Tam K. C. "Rheology and dynamics of associative polymers in shear: Model and experiments" *Macromolecules*, 2006, 39(5), 1981.
25. Tripathi, A. Bozgur, O. and Chauhan, A. "Dispersion in microchannels with temporal temperature variations", *Physics Fluids*, 2005, 17, 103607.
26. Lee, J., and Tripathi, A. "On measurements of intrinsic viscosity of polymers using a microchannel device", *Analytical Chemistry*, 2005, 77 (22), 7131-7136.

Manuscripts (prior to joining Brown University)

27. McKinley, G. H. and Tripathi A., "Extracting the Newtonian viscosity from observations of capillary breakup in a filament rheometer", *J. Rheol.*, 2000, 44(3).
28. Tripathi, A., Whittingstall, P. and McKinley, G.H., "Using filament stretching rheometry to predict strand formation and "processability" in adhesives and other non-Newtonian fluids" *Rheol. Acta.*, 2000, 39(4) 321-337.
29. Tirumkudulu M, Tripathi A. and Acrivos A.. "Particle segregation in monodisperse sheared suspensions" *Gallery of fluid motions*, *Phys. Fluids*, 1999, 11(9), S13.
30. Tirumkudulu M, Tripathi, A. and Acrivos, A. Particle segregation in monodisperse sheared suspensions (1999) *Phys. Fluids* 11(3), 507-509.
31. Tripathi, A. and Acrivos, A. Viscous resuspension in a bi-density suspension. (1999) *Int. J. Multiphase Flow*. 25(1) 1-14.
32. Breedveld, V., van den Ende, D., Tripathi, A. and Acrivos, A. The measurement of the shear-induced particle self-diffusivity in concentrated suspensions by a novel method. (1998) *J. Fluid Mech.* 375, 297-318.

33. Tripathi, A. and Acrivos, A. A new criterion for the continuous operation of supersettlers in the bottom feeding mode. (1996) *Int. J. Multiphase Flow*. 22(2), 353-361.
34. Tripathi, A. and Chhabra, R. P. Transverse laminar flow of non-Newtonian fluids over a bank of long cylinders. (1996) *Chem. Eng. Comm.* 147, 197-212.
35. Tripathi, A., Chhabra, R. P. and Sunderarajan, T. Predictions of drag and shape of a fluid particle in creeping flow by upper bound approach. (1995) *Int. J. Engng. Sci.* 33(1), 13-25.
36. Tripathi, A. and Chhabra, R. P. Drag on spheroidal particles in Dilatant fluids. (1995) *AIChE. J.* 41(3) 728-731.
37. Manjunath, M., Tripathi, A., Chhabra, R. P. and Sunderarajan, T. Numerical simulations of the drag on a swarm of bubbles. (1994) *Int. J. Engng. Sci.* 32(6), 927-933.
38. Tripathi, A. and Chhabra, R. P. Hydrodynamics of creeping motion of an ensemble of power law fluid drops in an immiscible power law medium. (1994) *Int. J. Engng. Sci.* 32(5), 791-803.
39. Tripathi, A., Chhabra, R. P. and Sunderarajan, T. Power law fluid flow over spheroidal particles. (1994) *Ind. Eng. Chem. Res.* 33, 403-410.
40. Geeta, B., Tripathi, A. and Narasimhan, S. Analytical expressions for estimating damage area in toxic gas releases. (1993) *J. Loss Prev. Process Ind.* 6(2), 125-131.
41. Chhabra, R. P. and Tripathi, A. A correlation for the viscosity of liquid metals. (1993) *High Temp.-High Press.* 25, 713-718.
42. Tripathi, A. and Chhabra, R. P. Slow power law fluid flow relative to an array of infinite cylinders. (1992) *Ind. Eng. Chem. Res.* 31, 2754-2759.
43. Tripathi, A. and Chhabra, R. P. Slow motion of a power law liquid drop in another immiscible power law liquid. (1992) *Archive of App. Mech.* 62, 495-504.

### **Web and Media Invites**

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1) Our article, "Taylor dispersion in polymerase chain reaction in a microchannel," published in *Physics of Fluids* 20, 093601 (2008), has been selected for the September 15, 2008 issue of Virtual Journal of Biological Physics Research (<http://www.vjbio.org>). The Virtual Journal, which is published by the American Physical Society and the American Institute of Physics in cooperation with numerous other societies and publishers, is an edited compilation of links to articles from participating publishers, covering a focused area of frontier research.

2) Our article, "Taylor dispersion in polymerase chain reaction in a microchannel," published in *Physics of Fluids* 20, 093601 (2008), has also been selected for the September 15, 2008 issue of *Virtual Journal of Nanoscale Science & Technology* (<http://www.vjnano.org>).

3) Our article "Nanoneedle Method for High-Sensitivity Low-Background Monitoring of Protein Activity" published in *Langmuir*, 24(19) (2008), has been selected in *Nanowerk Spotlight* section (<http://www.nanowerk.com/>). Nanowerk is the No. 1 ranked information site for nanoscience and nanotechnology with thousands of readers every day. The article is live on <http://www.nanowerk.com/spotlight/spotid=7567.php>.

## **Patents Applied from Brown University**

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1. “Simultaneous Quantitative Multiple Primer Detection of *Clostridium difficile*” (Tripathi, A., Saarma, A. and others) Patent filed, by Brown University, (2009).
2. “A low cost, versatile, programmable control system for microfluidic research” (Tripathi, A. and Rosenstein, J.) Patent filed, by Brown University, Reference number -2670.2004-001.

## **Patents Applied from Caliper LifeSciences**

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1. US patent (60/507,740) Methods for measuring diffusivities of compounds using microchips, by Caliper Technology (2003)
2. US patent (10/008,664) Microfluidic Viscometer, by Caliper Technology (2003)
3. US patent (to be found) Pulsed field electrophoresis, by Caliper Technology (2001)
4. US patent (100/17300) Method to Eliminate Transient Spikes on Fluidic Flow Caused by Inadequate Current and Voltage Changes

## **Invited Lectures**

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1. “Isolation, amplification and detection of Influenza RNA” 12/03/07, Massachusetts General Hospital, Boston, MA.
2. “A microfluidic platform for biomedical research” 04/28/2007, Department of Chemistry and Material Science, University of Massachusetts at Dartmouth, MA.
3. “Developing microfluidics routes for biomedical research” 01/04/07, Department of Chemical Engineering, Northwestern University, Evanston, IL.
4. “A microfluidic platform for rapid Influenza subtyping” 10/28/2006, Department of Chemical and Biomedical Engineering, Syracuse University, Syracuse, NY.
5. “Detection of H5 Influenza using isothermal amplification” 09/22/2006, Department of Mechanical Engineering, Northeastern University, Boston, MA.
6. “A microfluidic platform for rapid Influenza subtyping” 10/28/2006, Department of Chemical and Biomedical Engineering, Syracuse University, Syracuse, NY.
7. “Investigating protein structure and sizing using microfluidic platform” 02/28/06, Department of Chemical Engineering, Vanderbilt University, Vanderbilt, TN.
8. “Microfluidic separation of proteins in semi-dilute polymer solutions” 10/11/2004, Department of Chemical Engineering, University of Florida, Gainesville, FL.
9. “Microfluidic separation of proteins: model and experiments” 12/03/2004, New England Complex Fluid Workshop, Harvard University.
10. “Separation of proteins: model and experiments” 01/18/2005 Department of Chemical Engineering, Columbia University, New York.
11. “Microfluidic separation of proteins in semi-dilute polymer solutions” 03/11/2005 Department of Chemical Engineering, Tulane University, New Orleans.
12. “Microfluidic and Biochemical Assays” 03/17/2005 Department of Chemical Engineering, University of Rhode Island, RI

## Research Presentation

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### 2008

1. **Tripathi, A.**, Kerby, M. B., Jouzi, M., Xu, J., “A Nanoneedle Interface for High-Sensitivity Low-Background Monitoring of Protein Activity”, American Institute of Chemical Engineers (AIChE) National Meeting, Philadelphia, PA, Nov 16-21, 2008
2. **Kulla, E.**, Miller, P., Tripathi, A., Chauhan, A., “DNA Amplification In An Integrated Microchip with Temporal Thermal Control”, American Institute of Chemical Engineers (AIChE) National Meeting, Philadelphia, PA, Nov 16-21, 2008
3. **Tripathi, A.**, Mouallem, L., Patel, M., Chauhan, A. “Identification of Differences In Adsorption Between Protein Isoforms”, American Institute of Chemical Engineers (AIChE) National Meeting, Philadelphia, PA, Nov 16-21, 2008
4. **Tripathi, A.**, Oliver, G., Simpson, C., Kerby, M. B., Chauhan, A., “Electrophoretic Migration of Proteins In Semi-Dilute Polymer Solutions”, American Institute of Chemical Engineers (AIChE) National Meeting, Philadelphia, PA, Nov 16-21, 2008
5. **McCalla, S. E.**, Prachanronarong, K., Tripathi A “Continuous In Vitro Transcription of H5 Influenza Vrna In a Novel Microreactor”, American Institute of Chemical Engineers (AIChE) National Meeting, Philadelphia, PA, Nov 16-21, 2008
6. **Laulicht, B.**, Cheifetz, P., Mathiowitz, E., Tripathi A “Evaluation of Continuous Flow Nanosphere Formation by Controlled Microfluidic Transport”, American Institute of Chemical Engineers (AIChE) National Meeting, Philadelphia, PA, Nov 16-21, 2008
7. **Shapley, N. C.**, Larsen, M. L., Seward, M., Tripathi A “Biocompatible Nanoparticles Trigger Rapid Bacteria Clustering, American Institute of Chemical Engineers (AIChE) National Meeting, Philadelphia, PA, Nov 16-21, 2008.

### 2007

8. Lee, J., Jha, A., Bose, A., and **Tripathi, A.**,’ Direct Imaging of Amphiphilic Solutions Using a Microfluidic Chip Integrated With Cryo-Tem, AIChE 2007, Salt Lake City, Utah, Nov. 2007
9. Lee, J., Jha, A., **Bose, A.**, and Tripathi, A. “Exploration of New Transient Amphiphilic Structures Using a Microfluidic Chip Integrated with Cryo-TEM” in “Self-Assembly of Surfactants and Biomolecules 6: Nanoparticles” session at the 82 ACS Colloid and Surface Science Symposium June 15-18 in Raleigh, NC.
10. Lee, J., Jha, A., Bose, A., and **Tripathi, A.** “Exploration of new transient amphiphilic structures by a microfluidic chip-CryoTEM integrated system” in “new experimental methods” session at the 80th annual meeting of the Society of Rheology held in August 2008 in Monterey, CA.
11. Laulicht, B., Cheifetz, P., **Tripathi, A.** and Mathiowitz, E. “Microfluidic Nanosphere Production for Oral Drug Delivery Applications” at the 8<sup>th</sup> World Biomaterials Congress 2008 to be held in Amsterdam, Netherlands.
12. Poster Presentation on Global Health Diagnostics in 15<sup>th</sup> Annual Hospital Research Celebration at Rhode Island Hospital Nov. 13, 2007.
13. Lee, J., Jha, A., Bose, A., and **Tripathi, A.**,’ Direct Imaging of Amphiphilic Solutions Using a Microfluidic Chip Integrated With Cryo-Tem, AIChE 2007, Salt Lake City, Utah, Nov. 2007
14. Lee, J., Kulla, E., **Tripathi, A.** and Chauhan A., Dispersion of DNA plugs undergoing microfluidic PCR, AIChE 2007, Salt Lake City, Utah, Nov. 2007

15. Lee, J., Jha, A., Bose, A., and **Tripathi, A** Surfactant Self Assembly in Microchannel, 31<sup>st</sup> New England Complex Fluid Meeting 2007, Providence, June 2007
16. McCalla, Kerby MB, and **Tripathi A** Amplifying Influenza A RNA In A Microreactor Using In Vitro Transcription And Bead Immobilized DNA Templates, American Institute of Chemical Engineers (AIChE) National Meeting, Salt Lake City, UT, Nov 4-9, 2007
17. Kerby MB, **Tripathi A** Interpreting Kinetics from a Microfluidic Reactor: Mass Transfer or Reaction Limited?, at American Institute of Chemical Engineers (AIChE) National Meeting, Salt Lake City Utah, 2007 Nov. 4 -9.
18. Patel M, Waitzman J, Kerby MB, Chauhan A and **Tripathi A**, Identification Of Conformation Differences Between Protein Isoforms For The Development Of Resolute Separation Methods, at American Institute of Chemical Engineers (AIChE) National Meeting, Salt Lake City Utah, 2007 Nov. 4-9.
19. Angione S, Stahl E, Kerby MB, Artenstein A, Opal S, **Tripathi A** Detection and Identification of H3 Influenza RNA by Dual Labeled Probes, Poster presentation given at Biomedical Engineering Society (BMES), Los Angeles, CA, Sept 27-29, 2007.
20. McCalla S, Kerby MB, Artenstein A, Opal S, **Tripathi A** An Isothermal Microchip for Influenza A Subtype Detection, at Biomedical Engineering Society (BMES), Los Angeles, CA, Sept 27-29, 2007.
21. Kerby MB, McCalla S, Artenstein A, Opal S, **Tripathi A** Influenza A Amplification Using In Vitro Transcription in a Packed Bead Bed Microreactor, en at Biomedical Engineering Society (BMES), Los Angeles, CA, Sept 27-29, 2007.
22. Patel M, Kerby MB, **Tripathi A** Identification Of Differences Between Protein Isoforms For Resolute Separation, at Biomedical Engineering Society (BMES), Los Angeles, CA, Sept 27-29, 2007.
23. Kerby MB, Freeman SF, Prachanronarong K, Artenstein A, Opal S, **Tripathi A** Molecular Beacons for Identification of Influenza RNA, Poster presentation given at Rhode Island Space Grant symposium, April 28, 2007.

## 2006

24. **Tripathi, A.** and Chauhan, A. "Taylor Dispersion in PCR in a Microchannel" Session HA (Biofluid Dynamics IX) at the 2006 annual meeting of the American Physical Society held in November in Tampa Bay, FL.
25. **Kerby, M. B., Urban, J. C.** and Tripathi, A. "Role of Extensional Forces in Targeted Microparticle Adhesion" Session 15013 (Biomaterials and Tissue Engineering poster session) at the 2006 annual meeting of the American Institute of Chemical Engineers held in November at San Francisco, CA.
26. **Kerby, M. B., Freeman, S., Prachanronarong, K., Yizar, T., Loureiro, M.,** Artenstein, A. W., Opal, S. M. and Tripathi, A. "Isolation, Detection and Amplification of viral RNA" Session 15014 (Drug and gene delivery poster session) at the 2006 annual meeting of the American Institute of Chemical Engineers held in November at San Francisco, CA.
27. **Jha, A.,** Lee, J., Tripathi, A. and Bose, A. "The Role of Confinement on the Evolution of Surfactant Mesophases" Session 01C18 (Self Assembly in Solution I) at the 2006 annual meeting of the American Institute of Chemical Engineers held in November at San Francisco, CA.
28. **Tripathi, A.** and Chauhan, A. "Taylor Dispersion in Pcr in a Microchannel" Session 01J11 (Microfluidics and Small Scale flows) at the 2006 annual meeting of the American Institute of Chemical Engineers held in November at San Francisco, CA.



29. **Tripathi, A.**, Lim, K. G. and Palmore, T. “Optimization of Microfluidic Biofuel Cells Using Transport Principles” Session 01D03 (Transport and Reaction in Heterogeneous and Porous Systems) at the 2006 annual meeting of the American Institute of Chemical Engineers held in November at San Francisco, CA.
30. **Lee, J.**, Tripathi, A. and Bose, A. “Rapid Exploration of Phase Behavior in Surfactant Systems Using Microfluidics” Session 01C04 (Interfacial and Electrochemical Phenomena in Microfluidics and Mems Devices) at the 2006 annual meeting of the American Institute of Chemical Engineers held in November at San Francisco, CA.
31. Kerby, M. B., **Freeman, S.**, Prachanronarong, K., Yizar, T., Loureiro, M., Artenstein, A. W., Opal, S. M. and Tripathi, A. “Viral subtype identification using a linear RNA” Session (Device Technologies- Nano-Macro Scales – Integrated or Multifunctional Platform Technologies for Disease Detection, Diagnosis and Treatment I) at the 2006 annual meeting of the Biomedical Engineering Society held in October in Chicago, IL.
32. **Kerby, M. B.**, **Urban, J. C.** and Tripathi, A. “Role of Extensional Forces in Targeted Microparticle Adhesion” Session (Cellular and Molecular Engineering Poster Session) at the 2006 annual meeting of the Biomedical Engineering Society held in October in Chicago, IL.
33. **Holt, B.**, Tripathi, A., Clifton, R. and Morgan, J. “Viscoelastic characterization for optimization of the soft-tissue seal around osseointegrated lower-limb prosthetics” Poster Session at the 2006 annual meeting of the Society of Rheology held in October in Portland, Maine.

#### 2005

34. Tripathi, A., Reda, K. and **Bose, A.** “Flow and confinement effects on the evolution of surfactant mesophases” Session N at the 2005 annual meeting of the material research society held in December at Boston.
35. **Tripathi, A.**, Reda, K. and Bose, A. “Flow and confinement effects on the evolution of surfactant mesophases” Session MR (Microrheometry and microfluidics) at the 2005 annual meeting of the society of rheology held in October at Vancouver, Canada.
36. Tripathi, A. and **Lee, J.** “On Measurements of Intrinsic Viscosity of Polymers using a Microfluidic Chip” Poster Session at the 2005 annual meeting of the society of rheology held in October at Vancouver, Canada.
37. **Lee, J.** and Tripathi, A. “Microchip measurements of intrinsic viscosity of polymers and biopolymers” Session 01J11 (Poster session in fluid mechanics) at the 2005 annual meeting of the American Institute of Chemical Engineers held in November at Cincinnati, OH.
38. **Tripathi, A.** “Designing a semester long course in microfluidics for advance undergraduate science and engineering students” Session 4003 (Education: New ideas for electives and old courses I) at the 2005 annual meeting of the American Institute of Chemical Engineers held in November at Cincinnati, OH.
39. **Matt B. K.**, Legge, R. and Tripathi, A. “A continuous flow RNA microfluidic reactor for rare cell profiling” Session 15B15 (Advances in protein structure function and stability I) at the 2005 annual meeting of the American Institute of Chemical Engineers held in November at Cincinnati, OH.
40. **Matt B. K.**, Ziperstein, J. and Tripathi, A. “Measurements of protein folding and unfolding kinetic pathways using a microfluidic approach” Session TA007 (BioMEMS and microfluidic technology for cell and biomolecule analysis) at the 2005 annual meeting of the American Institute of Chemical Engineers held in November at Cincinnati, OH.



41. **Tripathi, A.**, Reda, K. and Bose, A. “Flow and confinement effects on the evolution of surfactant mesophases” Session 01J09 (Complex and Bio-fluid Dynamics II) at the 2005 annual meeting of the American Institute of Chemical Engineers held in November at Cincinnati, OH.
  42. **Matt B. K.**, Ziperstein, J. and Tripathi, A. “Protein folding and unfolding kinetic pathways using a microfluidic approach” Session TA007 (Screening and Diagnostics: Devices for use in Genomics and Proteomics session) at the 2005 annual meeting of the Biomedical Engineering Society held in September at Baltimore, MD.
- 2004
43. **Tripathi, A.**, Bozgur, O. and Chauhan, A. “Taylor Dispersion in microchannels with temporal temperature variation” Session 217 (Fundamental research in fluid mechanics: Microfluidic and low Reynolds number flow) at the annual meeting of the American Institute of Chemical Engineers held at Austin, TX. (2004)
  44. **Olivier, G.**, Simpson, C. and Tripathi, A. “Microfluidic separation of proteins in semi-dilute polymer solutions” Session 136 (Microfluidic chips for proteome analysis) at the annual meeting of the American Institute of Chemical Engineers held at Austin, TX. (2004)
  45. **Kerby, M.**, Lee, J. and Tripathi, A. “A Hele-Shaw microfluidic device for evaluation of targeted microspheres to physiological ligands” Session 134 (Microfluidic chips for biomedical applications) at the annual meeting of the American Institute of Chemical Engineers held at Austin, TX. (2004)
  46. **Lee, J.**, Rosenstein, J. and Tripathi, A. “On measurements of intrinsic viscosity of polymers using a microchannel device” Session 182 (Interfacial and electrochemical phenomena in microfluidics and MEMS II) at the annual meeting of the American Institute of Chemical Engineers held at Austin, TX. (2004)

### **Funded Projects**

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Funded projects from National Institute of Health, National Science Foundation and Industry.

### **Training Grants**

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1. T35 Training Grant “Alpert Medical School Summer Research Program” (PI: Phillip Grupusso)
2. Member of T32 Grant “Lung Injury and Molecular Cardiology” (PIs: Professors Gideon Koren & Sharon Rounds) 2008-2010
3. Member of Fogarty International Center Grant (NIH-NIBIB) “Framework Programs for Global Health” (PIs: Drs. Susan Cu-vin and Steven Mcgarvey) 2008-2010

### **Service (to the University)**

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- \* Member Engineering Executive Committee (9/2009 onwards)
- \* Member Glen Tung committee on hospital and university interactions
- \* Member Barry Connors committee on new avenues for research at Brown.
- \* Member Engineering Team for Admissions Office evaluations (2007 onwards)
- \* Member Faculty Committee on Medical Faculty Appointments (12/2008 onwards)
- \* Member Health Careers Advisory Committee (11/2008 onwards)
- \* Concentration Advisor, Biomedical Engineering Undergraduate Studies (2007 onwards)
- \* Member, Global Health Executive Committee (appointed by Dean of Biology and Medicine) (2008)
- \* Member, Faculty Search Committee 2 (Biomedical Engineering) (2008)
- \* Member, MD-PhD interview committee, Division of Biology and Medical Science. (2006-2007)
- \* Seminar Organizer, FTCP group, Division of Engineering. (2003-2004, 2006-onwards)
- \* Member, Graduate Curriculum Committee, Division of Engineering. (2005)
- \* Meiklejohn Academic Advisor (2004- 7students) (2005-6 students)

### **Service (to the profession)**

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- \* Member, NIH Review Panels, NSF and other agencies
- \* Reviewer to several scientific journals

## **Service (to the profession): Session chaired and/or organized in National Conferences**

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### 2008

1. Organizing Chair: Sessions (Contributed talks on microfluidics and small-scale flows I, II and II ) at the 2008 annual meeting of the American Institute of Chemical Engineers to be held in November at Philadelphia, PA
2. Chair: Session (Microscopic and Microfluidic Rheometry) at the 2008 Annual Meeting of the Society of Rheology held in August at Monterey, CA.

### 2007

3. Chair: Session (Complex fluids) at the 2007 annual meeting of the American Institute of Chemical Engineers held in November at Salt Lake City, UT.

### 2006

4. Chair: Session HA (Biofluid Dynamics IX) at the 2006 annual meeting of the American Physical Society held in November in Tampa Bay, FL.
5. Chair: Session T3007 (Biomems and microfluidics: cell and biomolecule analysis) at the 2006 annual meeting of the American Institute of Chemical Engineers held in November at San Francisco, CA.
6. Judge: Poster session 15014 (Drug and gene delivery poster session) at the 2006 annual meeting of the American Institute of Chemical Engineers held in November at San Francisco, CA.

### 2005

7. Chair: Session MR (Microrheometry and microfluidics) at 2005 annual meeting of the society of rheology held in October at Vancouver, Canada.
8. Chair: Session RM (Rheology at microscopic scales) at 2005 annual meeting of the society of rheology held at Lubbock, TX.
9. Co-Chair: Session 217 (Fundamental research in fluid mechanics: Microfluidic and low Reynolds number flow) at the annual meeting of 2005 American Institute of Chemical Engineers held at Austin, TX.
10. Chair: Session 215 (Fundamental research in fluid mechanics: Microscale flows) at 2005 annual meeting of the American Institute of Chemical Engineers held at Austin, TX.
11. Co-chair: Session 185 (Transport at interfaces I) at 2005 annual meeting of the American Institute of Chemical Engineers held at Austin, TX.

## **Honors and Awards**

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<b>Nominated for Henry Merrit Wriston Fellowship</b>	2008
<b>Nomination for Karen T. Romer Prize for Undergraduate Advising</b>	2008
<b>Nominated for Barrett Hazeltine Citations</b>	2004, 2005, 2008
<b>Tau Beta Pi Excellence in Teaching and Advising Award</b>	2004-2005
<b>Best poster award at the sixteenth annual gallery of fluid motion exhibit</b> The American Physical Society, Division of Fluid Dynamics in Philadelphia	1998
<b>Dissertation Research Fellowship, City University of New York</b>	1996

## Courses taught at Brown University

1. **Transport and BioTransport Processes** (EN0111), 2005 onwards
2. **Undergraduate Fluid Mechanics** (EN081), 2003-2007
3. **Microfluidics and its application in biotechnology** (EN292S14). 2004-2006

### **Guest Lectures:**

- 1) **Techniques in Molecular and Cellular Sciences** (BIO0213, Dr. Jeffrey Morgan)
- 2) **Synthetic Biology Systems** (BIO 121 Prof. Gary Wessel)

## Graduate students (PhD and Masters) supervision

<u>Student</u>	<u>Level of Study</u>	<u>Date of Graduation</u>	<u>Field of Study</u>
(1) Eugene Wan <i>Thesis Title: Novel Separation of Protein Isoforms by exploiting differences in Refolding Pathways</i> Current affiliation: Bain and Company, London, UK.	M.S.	May 2006	Biomedical Engineering
(2) Mathew B. Kerby <i>Thesis Title: Transport, Kinetic &amp; Thermodynamic Insight for the Isolation, Amplification and Identification of Viral RNA.</i> Current affiliation: Department of Bioengineering, Stanford University, Palo Alto, CA.	Ph.D.	October 2007	Biomedical Engineering
(3) Jinkee Lee <i>Thesis Title: Developing Microfluidic Routes for Understanding Transport of Complex and Biological Fluids; Experimental, Numerical and Analytical Approaches.</i> Current affiliation: Division of Engineering, Harvard University, Cambridge, MA.	Ph.D.	December 2007	FTCP, Engineering
(4) Madhukar Patel <i>Thesis Title: Identification of Conformation Differences between Protein Isoforms for the Development of Resolute Separation Methods</i> Current affiliation: Medical School, University of California, Irvine, CA.	M.S.	June 2007	Biomedical Engineering
(5) Bryan Laulicht (co-advised: Professor Edith Mathiowitz) <i>Thesis Title: Optimizing drug delivery vehicles</i>	Ph.D.	2009	Applied Biology Program
(6) Matthew Seward <i>Thesis Title: Nanoparticle induced pathogen lysis</i>	M.S.	June, 2008	Biomedical Engineering
(7) Stephanie McCalla <i>Thesis Title: Detection of point mutations in HIV-1 RNA</i>	Ph.D.	2010	Biomedical Engineering
(8) Elejdis Kulla <i>Thesis Title: PCR on a microchip</i>	Ph.D.	2010	Biomedical Engineering
(9) Kristina Prachanronarong <i>Thesis Title: Influenza detection on a chip</i>	M.S.	June, 2008	Chemical Engineering
(10) Melissa Loureiro <i>Thesis Title: Drops on surface</i>	M.S.	June, 2008	Mechanical Engineering
(11) Aleksey Novikov	M.D	June, 2011	Medical School

## Undergraduate research students advised in Brown University

- (1) **Gloria Olivier** (Chemical Engineering major), 2003-2004.
- (2) **Christina Simpson** (Civil Engineering major), summer 2004, Fall 2004.

- (3) **Larson Plano** (Mechanical Engineering major), summer 2004.
- (4) **Daniel MacArthur** (Chemical Engineering major), Spring 2004.
- (5) **Joshua Zipperstein** (Biomedical Engineering major), 2004-2005
- (6) **Jacob Rosenstein** (Electrical Engineering major), 2003-2004.
- (7) **Robert Legge** (Mechanical Engineering major), 2005-2006.
- (8) **Cartney Smith** (Chemical Engineering major) 2006.
- (9) **Melissa Loureiro** (Mechanical Engineering major), 2006-2007.
- (10) **Sarah Freeman** (Biomedical Engineering major), 2006-2007
- (11) **Kareem Reda** (Chemical Engineering major), 2006-2007.
- (12) **Kristina Prachanronarong** (Chemical Engineering major), 2006-2007
- (13) **Tiffany Yizar** (Chemical Engineering major), 2006-2007
- (14) **Jane Urban** (Engineering major), 2006-2007.
- (15) **Stephanie Angione** (Biomedical Engineering major), 2006-2008.
- (16) **Lea Mouallem** (Chemical Engineering major), 2007-2008.
- (17) **Elizabeth Mermel** (Vassar College, Biomedical Engineering major), 2007-summer.
- (18) **Michael Huang** (Chemical Engineering major), 2007-summer.
- (19) **Reese Isaacson** (Biology Major, Class 2008) 2007. Undergraduate at Vassar, summer at Brown
- (20) **Jennifer Fieber**, (Biology Major, Class 2008) 2007. Undergraduate at Brown
- (21) **Eric Stahl** (Biomedical Engineering major), 2006-2008.
- (22) **Andrea Jones** (Chemical Engineering major), 2007-2010.
- (23) **Aartik Sarma** (Biomedical Engineering major), 2006-2009.

#### **Thesis committee member**

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- (1) **Gary Withey**, PhD 2007 (Professor Jimmy Xu)
- (2) **Adam Lazareck**, PhD 2007 (Professor Jimmy Xu)
- (3) **Adam Hartman**, PhD 2007 (Professor Jimmy Xu)
- (4) **John Jarrel**, PhD 2007 (Professor Jeffery Morgan)
- (5) **Anthony Napolitano**, PhD 2007 (Professor Jeffery Morgan)
- (6) **Keng Guan Lim**, PhD 2007 (Professor Tayhas Palmore)

- (7) **Maryam Jouzi**, PhD 2007 (Professor Jimmy Xu)
- (8) **Guochun Wang**, PhD 2007 (Professor Tayhas Palmore)
- (9) **Grace Li**, PhD 2008 (Professor Diane Hoffman-Kim)
- (10) **Brian Holt**, PhD 2009 (Professor Jeffery Morgan)
- (11) **Matthew Finn**, Sc.B. 2008 (Professor Diane Hoffman-Kim)
- (12) **Adam Rego**, Sc. B. 2008 (Professor Jeffery Morgan)
- (13) **Ashwani Ranjan**, Sc. B 2008 (Professor Thomas Webster)
- (14) **Kwang Min –Kim**, PhD expected 2010 (Professor Tayhas Palmore)
- (15) **Justin T. Seil**, PhD expected 2010 (Professor Thomas Webster)
- (16) **Danya M. Decoteau**, PhD expected 2010 (Professor Edith Mathiowitz)
- (17) **Jacquelyn Youssef**, PhD expected 2010 (Professor Jeffery Morgan)
- (18) **Chang, Yao**, PhD 2008 (Professor Thomas Webster)
- (19) **Roshni Patel**, PhD expected 2010 (Professor Michael Lysaght)
- (19) **Jeremy, Choy**, MS 2008 (Professor Edith Mathiowitz)
- (21) **Susannah Gilbert**, Sc. M. 2009 (Professor Joseph Crisco)
- (22) **Vince Siu**, Ph.D. 2011 (Professor Tayhas Palmore)