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ARJUN S. ADHIKARI

EDUCATION

Stanford University, Stanford, California

Doctor of Philosophy in Chemical Engineering (September 2008 – Present)

- Advisor – Dr. Alexander Dunn
- Research Focus – Single Molecule Biophysics

Polytechnic University (Polytechnic Institute of NYU), Brooklyn, New York

Bachelor of Science in Chemical and Biological Engineering (Sept 2004 - June 2008)

- Summa Cum Lauda
- Outstanding Graduate Award
- GPA 3.95/4.00

Masters of Science in Chemical and Biological Engineering (Sept 2006 - June 2008)

- Advisor – Dr. Stavroula Sofou
- Thesis – Fluorescence based methods for the detection of lateral heterogeneities in lipid membranes

AWARDS

Tau Beta Pi Fellowship (2008-2009)
Outstanding Graduate Award – Polytechnic University (June 2008)
Sidney A. Savitt Award – Chemical Engineering Graduate Award (June 2008)
AIChE Student Conference Poster Competition – 1st Place (November 2007)
Othmer-Jacobs travel award, 2007 (For attending AIChE National Conference)
NYSTAR Undergraduate Research Fellowship, June 2007 – June 2008
Tau Beta Pi Stabile Scholarship, 2007-2008
DAAD (German Academic Exchange) RISE Fellowship, 2006
Bauerle Endowed Scholarship, 2006
Tau Beta Pi (National Engineering Honors Society), 2006
Omega Chi Epsilon (Chemical Engineering Honors Society), 2006
Polytechnic University Honors College Student
Dean's List (all semesters)
Honors College full tuition scholarship

PUBLICATIONS

1. Gautam Bajagur Kempegowda, Shrirang Karve, Amey Bandekar, **Arjun Adhikari**, Tamara Khaimchayev, Stavroula Sofou "pH-Dependent Formation of Lipid Heterogeneities Controls Surface Topography and Binding Reactivity in Functionalized Bilayers", *Langmuir* **2009**, 25 *(14)*

2. **Arjun Adhikari**, Xueling Zhao, Stavroula Sofou ,"A fluorescence-based method for the evaluation of lateral phase separations in lipid membranes", *in preparation*

RESEARCH EXPERIENCE

***Stanford University*,** *Department of Chemical Engineering,* Stanford, CA (April 2009-Present)

Characterizing effect of force on proteolysis of ECM proteins by Matrix Metalloproteinases

Cleavage of ECM proteins like collagen and fibronectin is instrumental in cell motility, wound healing and cancer metastasis. All these processes involve force and proteolysis. My interest is to study the effect of applied load on the cleavage of these proteins by Matrix Metalloproteinases using Magnetic Tweezer/Single molecule fluorescence.

Development of massively parallel flow based single molecule force assay

Unfold FRET labeled DNA hairpins attached to long DNA molecules using shear flow. Use single molecule fluorescence to study several molecules in a given field of view and thus develop a highly parallelized and cost effective single molecule assay.

Polytechnic University, *Laboratory of Drug Delivery Systems,* Brooklyn, NY (September 2006 – June 2008)

Detecting "Raft Switches" using fluorescence markers in rigid liposome membranes

A method was developed for the study of lipid membranes containing 'raft-switches': lipid phase-separated domains formed by decreasing pH. Membranes containing pyrene-labeled lipids were studied for phase separation using fluorescence spectroscopy. Domain formation kinetics and reversibility were evaluated, and the effect of electrostatics on lipid-phase separation was accessed.

Martin Luther Universitat, *Department of Thermal Separation Process,* Halle, Germany (*Summer 2006)*

Effect of Lithium Sulfate concentration on extraction of Urease

Find feasible ways of using crystallization as a protein purification method on an industrial scale. My main responsibility was to analyze the effects of lithium sulfate salt concentration on the extraction of urease from jack beans.

EXPERIMENTAL SKILLS

Techniques: Fluorescence Spectroscopy, Single Molecule Total Internal Reflection Fluorescence (TIRF), Single Molecule Fluorescence Resonance Energy Transfer (FRET), Magnetic Tweezers, Dynamic Light Scattering, Size Exclusion Chromatography, Fabrication of Nanoparticles (liposomes), Standard Molecular Biology Techniques: Cell culture, Protein Expression and Purification, PCR, Gel Purification, Cloning.

Instrumentation: Built Single Molecule TIRF Microscope and Magnetic Tweezers. Designed and constructed a micro-fluidic system for highly parallelized single molecule force assay.

PRESENTATIONS

1. *Fluorescence based methods for the detection of lateral heterogeneities in lipid membranes,* **Arjun Adhikari,** Xueling Zhao, Tamara Khaimchayev, Stavroula Sofou. Second Conference on Drug Delivery and Translation Research, Polytechnic University, NY (May 2008)

2. *Detection of pH-tunable "Raft Switches" using fluorescence markers in rigid liposome membranes,* **Arjun Adhikari**, Thomas Burns, Xueling Zhao, Stavroula Sofou. AICHE Student Conference, Salt Lake City, Utah (November 2007)

3. *Lipid Phase Separated Domains Controlled by pH,* Shrirang Karve, Gautam Gowda, **Arjun Adhikar**i, Tamara Khaimchayev, Stavroula Sofou. AICHE Annual Conference, Salt Lake City, Utah (November 2007)

4. *Detection of pH-tunable "Raft Switches" using fluorescence markers in rigid liposome membranes,* **Arjun Adhikari**, Thomas Burns, Tamara Khaimchayev, Xueling Zhao, Stavroula Sofou. New Student Convocation – Polytechnic University, NY (August 2007)

TEACHING EXPERIENCE

Teaching Assistant, **Chemical Engineering Kinetics**, Department of Chemical Engineering , Stanford University (September 2009 – December 2009)

Guest lecture to present new material to students, held office hours to enhance students' understanding of the course material, designed and graded problem sets.

Teaching Assistant, **Transport Phenomena**, Department of Chemical and Biological Engineering , Polytechnic University (September 2007 – December 2007)

Held office hours to answer students' questions pertaining to the course materials, and graded the students' homeworks.

Teaching Assistant, **Drug Delivery**, Department of Chemical and Biological Engineering, Polytechnic University (February 2008 – June 2008)

Conducted laboratory experiments for undergraduate students to enhance their knowledge of the lecture material.

Head Tutor /Chemistry Team Leader, Polytechnic Tutoring Center (February 2006 – June 2007)

Helped students gain a better understanding of the subject material. As a team leader, I led a team of 6 tutors and worked closely with both the tutors and the faculty to analyze the potential problems the students may face with the subject material and how to improve the course. During the two years I was also instrumental in developing tutoring for higher level chemistry courses and starting Biology tutoring.

LEADERSHIP POSITIONS

President – Tau Beta Pi (2007 - 2008)

President – Omega Chi Epsilon (2006 – 2007)

Helped Dr. Sofou organize the Second Conference on Drug Delivery and Translational Research at Polytechnic University (May 2008)

LANGUAGES

English (Fluent), Hindi (Fluent), Bengali (Conversational), Urdu (Conversational)