

Biotech Career Seminar Series

# **PhD Resume Panel**

Thursday, July 31, 12-1 PM, BME 1103

**Greg Weaver**

(Human Resources, Aderans Research Institute)

**Vern Liebmann**

(Vice President Operations, Aderans Research Institute)

**Bobby Orr**

(Director of Advanced Surgical Concepts, Bard Urological  
Division)

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E-mail: xxxxxxxxxxxxxxxxxxxxxx  
Address : xxxxx

Office Phone: xxxxxxxxxxxxxx

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<b>Objective</b>	A full time position utilizing innovative and technical skills in biotechnology and medical device industry.	
<b>Education</b>	<b>PH.D. in Bioengineering</b> , minor in business <i>Georgia Institute of Technology</i> , GPA: 3.4/4.0	2004 – 2009 (expected)
	<b>M.S.E. in Biomedical Engineering</b> <i>University of Michigan – College of Engineering</i> , GPA: 6.8/9.0	2003 – 2004
	<b>B.S.E. in Biomedical Engineering</b> <i>University of Michigan – College of Engineering</i> , GPA: 3.4/4.0	2000 – 2003
<b>Experience</b>	<b>Graduate Research Assistant</b> <i>Georgia Institute of Technology, Atlanta GA</i>	2004 – Current
	<ul style="list-style-type: none"><li>♦ Fabricating cost-effective and patient compliant microneedles for transdermal drug delivery.</li><li>♦ Evaluating microneedle skin insertion <i>in vitro</i> and delivery <i>in vivo</i>.</li><li>♦ Evaluating vaccine stability during encapsulation, storage and handling.</li><li>♦ Trained and guided two undergraduate students conducting lab experiments.</li><li>♦ Came out with innovative concepts of transdermal delivery device for patent application.</li><li>♦ Synthesized biocompatible anticancer drug-encapsulated nanoparticles for drug delivery to cancer.</li></ul>	
	<b>Graduate Researcher</b> <i>University of Michigan, Ann Arbor MI</i>	2002 – 2004
	<ul style="list-style-type: none"><li>♦ Built cost-effective gravity-driven pumps to drive flows in microfluidic channels.</li><li>♦ Investigated mammalian cellular behaviors including migration, rolling and differentiation in microfluidic channels.</li><li>♦ Cultured cells in microfluidic compartments for perfusion study and drug toxicity assays.</li></ul>	
	<b>Internship Researcher</b> <i>Institute of Bioengineering &amp; Nanotechnology, Singapore</i>	summer 2003
	<ul style="list-style-type: none"><li>♦ Established a new research project on Lab-on-a-Chip from concept to patentable work in 3 months.</li><li>♦ Microfabricated the master molding structure for microfluidic devices in clean room.</li><li>♦ Studied cellular migration and deformation in capillary-mimicked microfluidic devices.</li></ul>	
<b>Leadership</b>	<b>Undergrad Summer Researcher</b> <i>University of Michigan, Ann Arbor MI</i>	summer 2002
	<ul style="list-style-type: none"><li>♦ Performed BCA protein assay to quantify protein content of unknown samples.</li><li>♦ Performed Succinate Dehydrogenase assay to quantify the number mitochondria present in cells</li></ul>	
	<b>Undergraduate Researcher</b> <i>University of Michigan, Ann Arbor MI</i>	2001 – 2002
	<ul style="list-style-type: none"><li>♦ Investigated traits and growth of <i>Arabidopsis</i> plant's wild-type and its mutants</li></ul>	
	<b>Bioengineering Graduate Student Advisory Committee (BGSAC) – Treasurer</b> <i>Georgia Institute of Technology, Atlanta GA</i>	2006 – Current
	<ul style="list-style-type: none"><li>♦ Coordinated Biomedical Engineering Poster Session with a total number of 29 posters displayed for new incoming graduate students.</li><li>♦ Crafted and submitted a budget proposal asking for funding support of BGSAC.</li><li>♦ Coordinated the caterers for “Foods around the World” social event.</li></ul>	
	<b>Georgia Tech Biotechnology Career Fair Committee Member</b> <i>Georgia Institute of Technology, Atlanta GA</i>	2007 – 2008
	<ul style="list-style-type: none"><li>♦ Planned and coordinated catering service for Biotech Career Fair.</li><li>♦ Involved in general planning, organization and meeting.</li></ul>	
	<b>Biomedical Engineering Society Academic Committee Chair</b> <i>University of Michigan, Ann Arbor MI</i>	2002 – 2003
	<ul style="list-style-type: none"><li>♦ Advised students on course selection, schedule planning, and other academic related issues.</li></ul>	

<b>Language</b>	♦	Fluent in English and Mandarin	
<b>Awards</b>	♦	Certificate of Research Excellence	<i>University of Michigan, Ann Arbor MI</i> winter 2002
	♦	Dean's List	<i>University of Michigan, Ann Arbor MI</i> winter 2002/ 2003
<b>Publication</b>	♦	X Zhu, <b>LY Chu</b> , B Chen, M Shen, B Hazarika, N Phadke and S Takayama. "Arrays of horizontally-oriented mini-reservoirs generate steady microfluidic flows for continuous perfusion cell culture and gradient generation". <i>Analyst</i> . 129, 2004.	
<b>Patents</b>	♦	<b>LY Chu</b> , M Prausnitz, submitted <b>2008</b>	
	♦	<b>LY Chu</b> "Integrated Cell Culture System" submitted to Georgia Tech Office of Technology Licensing <b>2005</b>	
	♦	MM Maran, F Tay, PL Mao, and <b>LY Chu</b> "Device and method for studying cell migration and deformation" (United States Patent 20050227350), published <b>2005</b>	
<b>Relevant Courses</b>	♦	Technical Communications	♦ Fluid Mechanics & Mass Transfer
	♦	Cell & Molecular Biology	♦ MicroElectroMechanical Systems (MEMS)
	♦	Drug Delivery & Pharmacology	♦ Principles of Management
	♦	Biomaterials & Polymer Science	♦ Financial & Managerial Accounting
	♦	Living System (in vivo) Laboratory	♦ Cooperate Innovation & Technology Venture
<b>Personal Interests</b>	♦	Drawing Portraits, Photography, Playing Piano and Violin in Chamber Music and Orchestra, Chess.	
	♦	Reading literature about Management, Investment, Innovation and Leadership.	

# XXXXXXXX XXXXXX XXXXXXXX

Campus Address  
XXXXXXXXXX  
XXXXXX, XX XXXXX

XXXXXX.XXXXXX@x.gatech.edu  
(xxx) xxx-xxxx

Home Address  
XXXXXXXXXX  
XXXXXX, XX XXXXX

A Ph.D. in biomedical engineering with a strong background in biology interested in working on biomaterials-based problems.

## Education

**Georgia Institute of Technology (GT) and Emory University (EU)**  
Ph.D. in Biomedical Engineering, Current GPA: 3.74/4.00

Expected Graduation: May 2009

**University of Illinois at Urbana-Champaign (UIUC)**  
B.S. in Biology-Honors, Minor in Chemistry, Final GPA: 3.65/4.00

Graduation: December 2003

## Research Experience

### **Graduate Research Assistantship, GT**

May 05 – present

Healing critically-sized in vivo bone defects using both cellular and biomaterials approaches  
Promoting osteogenesis of bone marrow stromal cells via retroviral delivery of a transcription factor  
Development of a collagen-mimetic surface coating to promote bone formation on synthetic biomaterials

### **Research Internship, Porex Surgical, Newnan, GA**

May 06 – Aug 06

Development of novel porous hydrogels for use as clinically-relevant craniofacial implants (this work was used to develop an existing patent at the company)  
Characterization of the shelf life of syringe-based products

### **Graduate Research Rotation, GT**

Mar 05 – May 05

Elucidation via RT-PCR of the gene expression profile of femoral fracture in mice (this work resulted in publication)  
Computer aided design of stainless steel blocks for torsional testing of mouse femurs

### **Graduate Research Rotation, GT**

Dec 04 – Mar 05

Identification of putative molecular targets of dexamethasone, a hormone involved in osteogenesis  
Elucidation via RT-PCR of one signaling pathway of dexamethasone (this work resulted in publication)

### **Undergraduate Research Fellowship, UIUC**

Aug 03 – Aug 04

Imaging of bone and soft tissue on hydroxyapatite scaffolds using micro-CT (this work resulted in publication)  
Development of a staining protocol for image contrast enhancement of soft tissue

### **Undergraduate Research Fellowship, UIUC**

May 02 – Aug 03

Development of an accelerated *in vitro* degradation protocol for synthetic hydroxyapatite scaffolds  
Quantification of the mechanical properties of degraded and non-degraded scaffolds (this work resulted in publication)

### **Research Internship, Time-O-Matic, Inc., Danville, IL**

May 01 – Aug 01

Quantification of optimum viewing angles for light emitting diodes (LEDs) for use in outdoor time and temperature signs  
Monitoring of static dissipative floor coating in technical work area and machine shop

## Laboratory Skills

Mammalian and bacterial cell culture, Cell/scaffold constructs for bone repair, Cell staining, Confocal microscopy, Flow cytometry, Protein activity assays, RT-PCR, Retroviral gene therapy, Mechanical testing of

synthetic and biological materials, Micro-computed tomography and the associated image processing, Subcutaneous and orthotopic implantation in rats

## **Communication and Leadership**

2 podium presentations and 3 poster presentation at scientific research conferences

4 papers published in peer-reviewed scientific journals

Teaching assistant for 19 students in an undergraduate biology lab course

Head TA for 50 students in an undergraduate physiology lab course

Research mentor for 2 undergraduate students (significant progress made on developing a new technique)

Student member of the BME Graduate committee (a faculty committee which guides program coursework and policies)

Social chair for BBUGS (a grad student organization with over 600 members, as social chair I organized bimonthly events while also managing the budget)

## **Honors and Awards**

NIH Cellular and Tissue Engineering Training Grant

Colgate-Palmolive Undergraduate Research Fellowship

Howard Hughes Undergraduate Research Fellowship

Dean's List, National Dean's List

Golden Key International Honor Society

National Society of Collegiate Scholars

James Scholar

Merit Scholarship

## **Community and Volunteer Involvement**

Hands on Atlanta Volunteer, GT Salsa Club, Nursing home volunteer, Intramural volleyball, Team Buzz, Society for Biomaterials Student Member, Hands on Atlanta Day, Tutoring at El Centro por los Trabajadores, Tango Society, Dancing Illini, Swing Society, Alternative Spring Break – Service Trip, Concert Band, Illini Pride – Orange Krush., Volunteer Illini Projects – Tutoring, Danville Municipal Band

## **XXXXX X. XXXXXXXXXXX**

111 XXXXXX Xxx., Apt. #1234 • Nowhere, GA 303xx • (xxx) xxx-xxxx • XXXX.XXXXXXXXXX@chbe.gatech.edu

### **EDUCATION**

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**GEORGIA INSTITUTE OF TECHNOLOGY, Department of Chemical and Biomolecular Engineering** **Atlanta, GA**  
**Ph.D. Candidate in Chemical and Biomolecular Engineering** *December 2008*

- Thesis Title: Chemical and Mechanical Stimulation for the Improved Properties and Preservation of Tissue-Engineered Cartilage
- Research Overview: Studied the biochemical and mechanical properties of tissue-engineered cartilage cultured under perfusion and shear in a mechanically active bioreactor system.
- Research Overview: Optimized the vitrification method for tissue-engineered cartilage.
- Graduate Research Assistantship (GRA) GPA: (3.16/4.00)

**UNIVERSITY OF TEXAS AT AUSTIN** **Austin, TX**  
**Bachelor of Science in Chemical Engineering** *May 2003*

- Focus in Bioengineering/Biotechnology GPA: (3.60/4.00)

### **EXPERIENCE**

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**GEORGIA INSTITUTE OF TECHNOLOGY** **Atlanta, GA**  
**Graduate Research Assistant** *August 2003-Present*

- Validated novel bioreactors for cartilage tissue engineering.
- Studied the effect of perfusion and shear stress on tissue-engineered cartilage growth.
- Studied cryopreservation/vitrification optimization methods for tissue-engineered cartilage.
- Mentored an Undergraduate Research Scholar (URS). *January 2007- December 2007*
- Supervised GTEC Summer Camp for middle school students. *Summer 2007*
- Graduate Teaching Assistant for Biochemical Engineering, Kinetics, Effective Communications, and Systems Physiology I.

**UNIVERSITY OF TEXAS AT AUSTIN** **Austin, TX**  
**Laboratory Research Technician** *May 2002-December 2002*

- Researched the toughness and fire retardance of blends consisting of ABS and Clay Nanocomposites.
- Used polymer extrusion and injection molding techniques to process blends.
- Performed tensile, elongation, and toughness testing as methods for determining mechanical properties.

### **SKILLS/PUBLICATIONS**

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#### **Skills:**

Culture: Cartilage isolation from calves, and cell isolation/cell culture of chondrocytes; Cryopreservation/vitrification of living tissues; Bioreactor culture and maintenance

Analysis: DNA, cells, glycosaminoglycans, collagens, protein, and viability quantification; Histological staining: H&E, safranin-O, and immunohistochemistry

Equipment: Confocal microscopy; Mechanical testing of soft tissues: dynamic, shear, aggregate modulus, and permeability

Software: Zeiss LSM, Slide Write, WinTest, Bohlin, JMP IN Statistics, Excel, Word, and PowerPoint

#### **Publications/Presentations:**

1. The Cryopreservation of Tissue-Engineered Cartilage **Hilton Head, SC**  
*March 2008*
  - poster presentation; Annual Hilton Head Workshop
2. Mechanical Stimulation for Improved Properties of Tissue-Engineered Cartilage **San Francisco, CA**  
*March 2008*
  - oral presentation; 54<sup>th</sup> Annual Meeting of the Orthopaedic Research Society
3. Cryopreservation of Tissue-Engineered Cartilage **San Diego, CA**  
*February 2007*
  - poster presentation; 53<sup>rd</sup> Annual Meeting of the Orthopaedic Research Society
4. Mechanical Stimuli for the Improved Properties of Tissue-Engineered Cartilage **Hilton Head, SC**  
*March 2007*
  - poster presentation; Annual Hilton Head Workshop

# JANE A. (DOE) DEER

1111 Main Street USA  
Anytown, Georgia 12345  
[jane.doe@gmail.com](mailto:jane.doe@gmail.com)

## EDUCATION

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<b>2005-present</b>	<b>Georgia Institute of Technology</b>	<b>Atlanta, GA</b>
<i>Ph.D. Chemical Engineering</i> (expected May 2010)		
<i>M.S. Chemical Engineering</i> (expected Dec 2008)		G.P.A. 3.80/4.00
Minor: Biochemistry		
Advisor: Dr. Andreas S. Bommarius		
<b>1996-2001</b>	<b>Georgia Institute of Technology</b>	<b>Atlanta, GA</b>
<i>B.S. Chemical Engineering</i> (May 2001)		G.P.A. 3.97/4.00
Cooperative Education Certificate		
Study Abroad: University College of London		

## ACADEMIC RESEARCH EXPERIENCE

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<b>2005-present</b>	<b>Georgia Institute of Technology</b>	<b>Atlanta, GA</b>
Graduate Research Assistant, Department of Chemical and Biomolecular Engineering		
<ul style="list-style-type: none"><li>• Biosynthesis of <math>\beta</math>-lactam antibiotics using a novel <math>\alpha</math>-Amino Ester Hydrolase enzyme.</li><li>• Cloning, expression, and characterization of a putative <math>\alpha</math>-Amino Ester Hydrolase from <i>Xanthomonas campestris</i> pv. <i>campestris</i></li><li>• Mentored two undergraduate students and research projects</li></ul>		
Teaching Assistant, Department of Chemical and Biomolecular Engineering		
<ul style="list-style-type: none"><li>• Drug Design, Development and Delivery (D4) (2008)</li><li>• Senior Design: Conversion of Lolloby Pine to Ethanol (2007)</li><li>• Unit Operations Lab– GT Chemical Engineering Outstanding TA Award (2006)</li></ul>		

### Conference Presentations:

Janna Blum, Javier Chaparro-Riggers, Bernard Loo, Karen M. Polizzi and Andreas S. Bommarius; 2007 AIChE National Conference; Broadening the Application of Enzyme Catalyzed Synthesis of Semi-Synthetic Antibiotics

## WORK EXPERIENCE

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<b>2003-2005</b>	<b>Merck &amp; Co. – Merck Research Labs</b>	<b>Westpoint, PA</b>
Staff Chemical Engineer, Bioprocess R&D		
<ul style="list-style-type: none"><li>• Engineering support for the cGMP production of Phase I and Phase II Clinical Material for developmental vaccine and monoclonal antibody production in Biologics Pilot Plant (BPP).</li><li>• Bioreactor equipment owner and manufacturing lead for medium scale cell culture and bacteria fermentation systems (yeast, <i>E.coli</i>, PER.C6, NS0) including Wave™ Bioreactor Technology.</li><li>• Modified Bioreactor Dissolve Oxygen (DO) and pH tuning and process parameters for cell culture to improve control. Dissolved oxygen was controlled at 30.0% +/- 0.1. This was the first time that enriched oxygen was successfully used to control the DO in the BPP.</li><li>• Suite supervisor and maintenance of batch documents, SOPs, preventative maintenance, class 10,000 room suite environmental monitoring, BAS.</li></ul>		
<b>2001-2003</b>	<b>Merck &amp; Co. – Merck Manufacturing Division</b>	<b>Elkton, VA Westpoint, PA</b>

#### Chemical Engineer, Technical Operations

- Engineering support for API manufacturing steps of CRIXIVAN™, SINGULAIR™, ZOCOR/MEVACOR™, and VARIVAX™
- Supported conceptual scope and basis of design for a Large Scale Cell Culture/Live Virus Facility (200MM\$). Led design efforts for small scale cell expansion, master cell seed, and master virus seed steps of the process.
- Performed Instrument Qualification (IQ)/Operation Qualification (OQ) for process equipment skids and building support systems for a new manufacturing facility. Worked with vendors to modify PLC code and Delta V code to improve system reliability and performance as noted during field processing.
- Optimized Westphalia scroll decanter operation in biological extraction process increase step yield, product yield increase valued at ~250M\$.
- Led IQ/OQ and Initial Cleaning activities for five 1,500 gal Seed Fermenters and a 20,000 gal Fermenter
- Supported capital project (500M\$) to install a new Westphalia Stacked Disc centrifuge including OQ Technical Support, Initial Cleaning, and Start Up.
- Optimized oxoester step of SINGULAIR™ process to reduce cycle time of process bottleneck

**1997-1999**

**BP Amoco Chemical Co.**

**Wando, SC**

Process Design Engineer – CO-OP ( 6 terms – 19 months)

- Generated a HYSYS simulation and a dynamic Excel spreadsheet (PI-PC) to aid in the optimization of the entire plant steam and condensate system.
- Designed and optimized a hydrocyclone for the Cooper River #2 oxidation plant. The hydrocyclone increased overall product yield and reduced solid waste.

#### HONORS AND AWARDS

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2007	GT Chemical Engineering Teamwork Award
2006	NSF Graduate Research Fellowship
2006	GT Chemical Engineering Outstanding Teaching Assistant
2005	Georgia Tech Presidents Fellowship
2001-2005	Merck Award for Excellence (4 awards)

#### ACTIVITIES

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2008-present	Student Government Association: Academic Affairs Chair
2008-present	Bioengineering Career Fair Committee Member
2006-present	Student Government Association: Chemical Engineering Department Senator
2007	Engineering Outreach Program "How Things Work"
2006- 2007	Association of Chemical Engineering Graduate Students Officer (GT chapter)
2006-2008	Georgia Tech Chemical and Biomolecular Engineering Graduate Symposium: Resume Book Co-Chair (3 events)
2005- present	Bioengineering United Graduate Students High School Outreach Events

#### SKILLS

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υ Molecular Biology Techniques υ High Performance Liquid Chromatography υ IQ/OQ/PQ (Process Validation) υ cGMP and CFR21 manufacturing υ CIP/SIP Cleaning Validation υ PLC and Delta V process control υ BL1 and BL2 facility design υ Statistical data analysis



**Research:**

PhD Thesis - Metabolic engineering of *Zymomonas mobilis* for increased production of ethanol from lignocellulose (08/2006 – Present)

*Dr. Rachel Chen, School of Chemical & Biomolecular Engineering, Georgia Tech*

Objective of this Chevron sponsored project is to metabolically engineer *Z mobilis* so as to – (a) increase specific productivity of ethanol, (b) enhance tolerance to common inhibitors, and (c) expand substrate range. The gene(s) to be manipulated for achieving these objectives have been identified. Some of these genes have been successfully cloned and expressed in the wild-type strain. Once the objectives are met, metabolic flux analysis will be done to study the flux redistribution in the engineered strain as compared to the wild-type strain.

Undergraduate research project

(07/2003-05/2004)

*Dr. S N Gummadi & Dr. K C Raj, Department of Biotechnology, IITM*

*Bacillus sp.* KCA102 capable of producing thermostable amylase in a short fermentation time (18–20 h) was screened from a soil sample. The performance of amylase during hydrolysis of starch was studied using response surface methodology. The parameters under study had been categorized into two, viz., physical parameters (pH, temperature and time) and chemical parameters (amounts of substrate and enzyme). The optimal conditions of pH, temperature and time at which maximum amount of glucose formed were found to be 7.1, 57.5 °C and 25 min, respectively. The optimal amounts of substrate and enzyme for maximum hydrolysis were found to be 0.5% starch and 94 mU/ml of amylase, respectively.

**Education:**

Georgia Institute of Technology, USA

(08/2006 – Present)

- Pursuing doctoral studies in Chemical and Biomolecular Engineering, CGPA 4 / 4

Indian Institute of Technology (IIT) – Madras, India

(07/2000 – 05/2004)

- Bachelors of Technology in Chemical Engineering
- Minor degree in Trends in Business and Finance
- CGPA 8.45 / 10; Department rank: 4 / 47

**Technical skills:**

- (a) Molecular Biology techniques – Cell culture, enzymatic assay, genomic DNA/plasmid extraction, PCR, gene cloning, fermentor operation
- (b) Analytical Techniques – UV-Vis spectroscopy, HPLC, gel electrophoresis, SDS PAGE
- (c) Computational skills – Metabolic flux analysis, bioinformatics; C++ programming; MATLAB, SCILAB, SIMULINK, ASPEN PLUS; ASP, PHP, Dreamweaver

## Teaching Skills

- Special Assignment to design the 'Protein Separation' experiment for the undergraduate Unit Operations Lab
- Teaching Assistant for 'Aerobic Fermentation Experiment' in Undergraduate Unit Operations Lab.
- Imparted technical and soft skills training to dealers manpower while at Tata Motors
- Teaching Assistant for the Biochemical Engineering Course at IIT-Madras.

## Publication:

M Agrawal, P Suresh, S N Gummadi and K C Raj, Hydrolysis of starch by amylase from *Bacillus* sp. KCA102: a statistical approach – *Process Biochemistry*, 2005, 40, 2499-2507.

## Work Experience:

- (a) Service Engineer (07/2004 – 07/2006)  
*Passenger Car Business Unit, Tata Motors, Lucknow, India*
- A technical and managerial link between the manufacturing plant and dealers of Tata Motors.
  - Preparing Customer Complaint Investigation Reports, Product Performance Reports, Pre-Delivery Inspection Reports for the Engineering Research Centre.
  - Imparting training to Dealers' manpower on standard operating procedures, product modifications, diagnosis of complaints and standard repair process.
- (b) Industrial Training (05/2003 – 07/2003)  
*Hindustan Petroleum Corporation Limited, Mumbai, India*

I went through the Process Flow Diagrams of the Lube Refinery and Diesel Hydro Desulphurization Unit. I did a project on redesigning the network of heat exchangers. To start with, I did a theoretical calculation of the minimum heating and cooling requirement for the network. Then, I simulated the process using HYSYS to arrive at an optimum design. My design, if implemented would result in at least 2% less consumption of steam.

## Awards and Honors:

- Rohm and Haas Fellowship for Academic Excellence, 08/2006 – 12/2006
- Outstanding Performance in Written PhD Qualifying Examination held in Spring 2007
- National Cadet Corps (NCC) 'B' certificate. NCC is a unit of Indian Army which imparts military training to students.
- Award for the maximum number of Complaint Investigation Report submitted at Tata Motors.

## Extra Curricular Activities:

- Webmaster for Dr. Rachel Chen's research group website (<http://www.chbe.gatech.edu/chen>)
- Events chair for CRY Atlanta, a charity organization working for the rights of underprivileged children
- Founding President of Displastics – A group formed in our hostel at IIT-Madras to free the hostel zone of plastic waste.
- Social secretary of the hostel at IITM.
- Hospitality coordinator in Shaastra and Saarang.