SMITA S. PATEL
Rutgers Robert Wood Johnson Medical School
Department of Biochemistry and Molecular Biology
675 Hoes Lane
Piscataway, NJ 08854

Phone: [732] 235 3372 Fax: [732] 235-4783 E-mail: patelss@umdnj.edu

EDUCATION

1984-1988	**Ph.D.** from Tufts University (Thesis Advisor: David R. Walt) Part I. Enzyme-Catalyzed Synthesis Using Acyl Coenzyme A Thioesters. Part II. Preparation and Na^+,K^+-ATPase Inhibition Studies of Novel C-17 Modified Cardenolides.
1980-1983	**M.Sc.** from The Indian Institute of Technology, Bombay, India.(Thesis Advisor: Anil K. Lala) Part I. Isolation and Characterization of the Lipid Cofactor of Castor Bean Lipase. Part II. Synthesis of Fluorescent Fluorene-Based Membrane Probes.
1980	**B.Sc.** from University of Bombay, India major in Chemistry and Physics

APPOINTMENTS

2013-present	Professor, Dept. of Biochemistry and Molecular Biology, Rutgers Robert Wood Johnson Medical School, NJ
2006-present	Member of the Biophysics program, Rutgers University
2006-present	Member of the BioMaps program, Rutgers University.
2005-present	Member of the graduate program in Dept. of Biochemistry and Molecular Biology, Rutgers University
2002-2013	Professor, Dept. of Biochemistry, UMDNJ Robert Wood Johnson Medical School, Piscataway, NJ.
1999-present	Member of the Molecular Bioscience program
1999-2002	Associate Professor, Dept. of Biochemistry, UMDNJ Robert Wood Johnson Medical School, Piscataway, NJ.
1996-1999	Associate Professor, Dept. of Biochemistry, The Ohio State University, Columbus, OH.
1992-1996	Assistant Professor, Dept. of Biochemistry, The Ohio State University.
1988-1991	Postdoctoral Research Associate in Prof. Kenneth Johnson's lab. at Pennsylvania State University, PA

HONORS & AWARDS

2013	Edward J. Ill Excellence in Medicine Awards, Outstanding Medical Research Scientist Award for Basic Biomedical Research (2013).

2010	UMDNJ Foundation Research Award for Basic Sciences
2009	Master Educator Guild of UMDNJ Award
2007	NIH MERIT Award
2007	Antoine Saugrain Award and Lecture, Chemistry and Biochemistry at Hunter College, NY.
2006	Paper of the Week, Journal of Biological Chemistry
2005	Nominated for the Howard Hughes Fellowship, Biochemistry Dept, Robert Wood Johnson Medical School, NJ.
2005	Invited honorary speaker for Frontiers in Biology, Stanford University Biochemistry Graduate Students.
2003	Co-organizer for the FASEB meeting on Helicases: Structure, Function and Roles in Human Disease
2001	Co-organizer for the FASEB meeting on Helicases: Structure, Function and Roles in Human Disease
1995-1998	Junior Faculty Research Award, American Cancer Society
1989-1992	National Institute of Health Postdoctoral Fellowship
1985-1986	DuPont Fellowship for Academic Excellence, Tufts University, MA
1983	Silver Medal for the Highest Rank among the 1983 graduating class, Indian Institute of Technology, Bombay, India

SERVICE ON UNIVERSITYCOMMITTEES:

2012-present	UMDNJ Appointments and Promotion Committee Member
2012-present	Department Standing Advisory Committee
2010-present	Deans Liaison Committee
2009-Present	GSBS Graduate Council Member
2009-present	UMDNJ Research Committee Member
2007-2010	UMDNJ Appointments and Promotion Committee Member
2004-2006	UMDNJ DIR Committee Member
2004-2006	RWJMS Bioinformatics faculty search committee
2002-2005	UMDNJ Review Committee
2001-present	Executive Committee of the graduate program of Biochemistry department
2000	Organizer of the Biochemistry Department Seminar Program
2001	Organizer of the Biochemistry Department Seminar Program
1999-present	Thesis and Ph.D. candidacy exam committees of several graduate students

SERVICE ON GRADUATE SCHOOL COMMITTEES:

2011-present	Molecular Biosciences Curriculum Committee
2009-Present	GSBS Graduate Council Member
2001-present	Executive Committee of the graduate program of Biochemistry department
1999-present	Thesis and Ph.D. candidacy exam committees of several graduate student

TEACHING:

1999-present	first year molecular biosciences graduate students core course
2010-present	Lectures and workshop coordinator for the Foundations in Medicine Biomedical Sciences course for MD students,
2010-present	lectures and small group discussions in Masters in Biomedical Sciences
2010-present	lectures and small group discussion in the PA program.
2010-present	Lectures and Jigsaw coordinator for the Foundations in Biomedical Sciences course for Medical students
2002-2008	Course co-organizer (with Helen Berman) for 50% teaching of the Graduate level Biophysics course
1999-present	Lectures in the Medical Biochemistry 6000 for first year medical students on enzymes, enzyme mechanisms, enzyme kinetics, and enzyme regulation.
1999-present	Small group workshops Biochemistry 6000
2009	Enzyme kinetics workshop in Biochemistry 6000
2005	Lectures and preparation of quizes, and course material for Quantitative Biochemistry (biochemical calculations) to first year graduate students.

RESEARCH TRAINING

Graduate training:

Manju Hingorani graduated in 1996, Ohio State University (presently an Associate Professor at Wesleyan University, CT)

Jia Yiping graduated in 1998, Ohio State University (presently a Research Scientist at FDA, DC)

Todd Washington graduated in 1998, Ohio State University (presently an Associate Professor at U. of Iowa, IA)

Peter Ahnert graduated in 2000, Ohio State University (presently the Director of Pharmacogenomics,Germany and faculty of U. of Leipzig, Germany)

Kristen Moore Picha graduated in 2000, UMDNJ (presently a Research Scientist at Centocor. PA(Johnson & Johnson)

Dong-Eun Kim graduated in 2001, UMDNJ (presently an Professor at Busan University in Korea)

Mikhail Levin graduated in 2002, UMDNJ (Research Assistant Professor U of Texas Southwestern Medical Center).

Natalie Stano graduated in 2003, UMDNJ (post-doc with Dr. Charles McHenry, U. of Colorado)

Vasanti Anand graduated in 2007, UMDNJ (Research Scientist at Wyeth Corp. NJ)

Ilker Donmez graduated in 2008, UMDNJ (Post-doctoral Fellow at Einstein University NY)

Vaishnavi Rajagopal graduate in 2009, UMDNJ (Post-doctoral Fellow at Johns Hopkins MD)

Swaroopa Paratkar 2010, UMDNJ (Research Scientist Bristol Myers Scribbs, NJ)

Doyel Sen, 2011, UMDNJ (Research Scientist SENS Foundation, CA)

Anand Ramanathan, 2013 Biochemistry and Molecular Biology Program, RWJMS

Aishwarya Deshpande, Biochemistry and Molecular Biology Program, RWJMS

Divya Nandakumar, Biochemistry and Molecular Biology Program, RWJMS

Swapnil Devarkar, Biochemistry and Molecular Biology Program, RWJMS

Post-doctoral training

Amar Kumar, Ohio State University

Rajiv Bandwar currently Principal Scientist at Signum Biosciences in NJ
Yong-Joo Jeong currently an Assistant Professor at Department of Bio and Nanochemistry, Kookmin University, Seoul, Korea
Guo-Qing Tang (Research Scientist at Roche Institute)
Manjula Pandey (graduate from IIT Delhi)
Shemaila Sultana (graduate from Hunter College)

RESEARCH AND DISCOVERIES

My laboratory is a leader in the enzymology of processive molecular motors such as helicases and polymerases that catalyze the enzymatic reactions of replication and transcription and helicases involved in innate immunity. With my training in bioorganic chemistry, fluorescence, and enzymology, I bring unique chemical and quantitative perspectives to problems in biology. My laboratory has expertise in molecular biology, protein expression and purification, and in employing biophysical methods, including transient state kinetics and fluorescence based methods, to study mechanisms of RNA and DNA helicases and polymerases from viruses and mitochondria. These approaches combined with single molecule and crystallography studies in collaborations have lead to many seminal discoveries from our research that impact fundamental understandings of replication, transcription, and innate immunity.

In **DNA replication** related research, we discovered the fidelity mechanism of T7 DNA polymerase, the ring-shaped structure of T7 DNA helicase, DNA binding in its central channel, the sequential NTP hydrolysis mechanism of hexameric helicases, collaborative catalysis of helicase and polymerase at the replication fork, and the priming loop structure in DNA during replication. Additionally, my laboratory has created many new clones and proteins, including exonuclease deficient T7 DNA polymerase, T7 helicase-primase, and its many mutants, and human mitochondrial helicase Twinkle that have biomedical and biotechnology applications.

In **DNA transcription** related research, we discovered the mechanism of promoter DNA opening by the RNA polymerase of phage and mitochondria, dissected the kinetic pathway of initial transcription by phage RNA polymerase, characterized conformational changes that lead to the transition from initiation to elongation, and developed new ways to measure RNA synthesis steps during initiation and elongation. We are continuing to study the mitochondrial enzymes to provide a framework to understand transcription and regulation in mitochondria.

In **innate immunity** related research, we developed methods to measure the affinities of RNA molecules to RIG-I and activate the enzymatic activities, and determined the crystal structure of RIG-I bound to RNA and ATP that provides unprecedented views on how this innate immunity receptor detects viral RNAs. We are continuing to identify new features of RNA that are recognized by RIG-I as non-self.

PUBLICATIONS: Pubmed list