CURRICULUM VITAE

Beena Krishnan

Dept. of Biochemistry & Molecular Biology
LGRT Room No. 1209
University of Massachusetts-Amherst
Amherst, Massachusetts 01003

beena@biochem.umass.edu
beenakrish@gmail.com

(413)545-3999 (Office)
(413)512-1525 (Mobile)
http://people.chem.umass.edu/gieraschlab/

RESEARCH INTEREST

- Understanding mechanisms of protein folding and mis-folding, in particular of proteases and their protein-based inhibitors implicated in human disease.
- Developing new strategies to investigate *in vivo* protein folding.
- Bacterial protein secretion machinery and its role in pathogenesis.

FELLOWSHIP GRANT

Postdoctoral Research Fellowship Grant from the Alpha-1 Foundation, 2007 - 2009 to carry out research at UMass, Amherst with Prof. Lila M. Gierasch as a mentor.
Project title: *Folding / misfolding landscape of alpha1-antitrypsin*

EDUCATION

Indian Institute of Science, Bangalore
Molecular Biophysics Unit, 1998 – 2004
Ph.D. in Biological Sciences, Area of Specialization: Biophysics

Indian Institute of Technology Powai, Mumbai
Biotechnology Centre (Now, School of Biosciences and Bioengineering), 1996 – 1998
M.Sc. In Biotechnology

Pune University, Pune
Fergusson College, Pune, 1993 – 1996
B.Sc.in Chemistry with Mathematics and Physics as subcidiary

RESEARCH EXPERIENCE

Postdoctoral Research:
Dept. of Biochemistry & Molecular Biology, Univ. of Massachusetts, Amherst, 2004 – Present
Research Advisor: Prof. Lila M. Gierasch

- Understanding the folding and mis-folding of proteins, CRABP I and Alpha-1 Antitrypsin, under conditions of its biosynthesis.
- Development of novel tools for biophysical and biochemical dissection of the in-cell protein folding machinery.

Doctoral Research:
Molecular Biophysics Unit, IISc. Bangalore, 1998 - 2004
Research Advisor: Prof. Raghavan Varadarajan
Collaborator: Prof. Jayant B. Udgaonkar

- Biophysical Characterization of Interaction of SecB with MBP and preMBP : *in vitro* Studies

Undergraduate Research:
Indian Institute of Technology, Powai, Bombay, 1997-1998
Research Advisor: Prof. K. K. Rao

- Identification of a region in the promoter of epr (extra cellular protease) sensing glucose, in *Bacillus subtilis*

Molecular Biophysics Unit, IISc. Bangalore, Summer 1997
Research Advisor: Prof. P. Balaram

- Fragment complementation studies on PfTIM

TEACHING EXPERIENCE

- Guest lecturing for Advanced General Biochemistry course offered for the graduate students.
- Mentoring high school, under graduate students, and graduate students.

PROFESSIONAL ACTIVITY

Reviewer for ***Chemistry - A European Journal*** &
Chemistry – An Asian Journal.

PUBLICATIONS

Krishnan B, Kulothungan SR, Patra AK, Udgaonkar JB, Varadarajan R.
SecB-mediated protein export need not occur via kinetic partitioning.
Journal of Molecular Biology 2009 385(4):1243-56.

Krishnan B, Gierasch LM.
Cross-strand split tetra-Cys motifs as structure sensors in a beta-sheet protein.
Chemistry & Biology 2008 15(10):1104-15.**(Cover)**

Krishnan B, Szymanska A, Gierasch LM.
Site-specific fluorescent labeling of poly-histidine sequences using a metal-chelating cysteine.
Chemical Biology & Drug Design 2007 69(1):31-40.

Ignatova Z, Krishnan B, Bombardier JP, Marcelino AM, Hong J, Gierasch LM.
From the test tube to the cell: exploring the folding and aggregation of a beta-clam protein.
Biopolymers 2007 88(2):157-63.

Beena K, Udgaonkar JB, Varadarajan R.
Effect of signal peptide on the stability and folding kinetics of maltose binding protein.
Biochemistry 2004 43(12):3608-19.

Panse VG, Beena K, Philipp R, Trommer WE, Vogel PD, Varadarajan R.
Electron spin resonance and fluorescence studies of the bound-state conformation of a model protein substrate to the chaperone SecB.
Journal of Biological Chemistry 2001 276(36):33681-8.

MANUSCRIPT UNDER PREPARATION

Krishnan B and Gierasch LM.
Highly efficient expression and rapid purification of recombinant human alpha-1 antitrypsin from *E. coli*

Krishnan B and Gierasch LM.
Characterization of a folding intermediate of alpha-1 antitrypsin suggests a mechanism for its *in vivo* aggregation

CONFERENCES & PRESENTATIONS

Talks

"A split-tetra-cysteine motif binding FlAsH can serve as a 'molecular proximity sensor' in vivo" at the 2007 Joint Retreat between the BMP Department at UMass Medical School and the BMB/CBI programs at UMass Amherst

"Developing New Strategies to Monitor in-vivo Protein Folding" at the Gordon Research Conference on Protein Folding Dynamics, Ventura, CA, Jan. 2006.

Poster presentations

"Characterization of a folding intermediate of alpha-1 antitrypsin suggests a mechanism for its in vivo aggregation" Beena Krishnan and Lila M Gierasch, at the Gordon Research Conference, Proteins, June 21-26 2009 at Holderness, NH.

"Using a Fragment Approach to Explore the Folding of Alpha-1 Antitrypsin" Beena Krishnan and Lila M Gierasch, at the Fourth Annual NIH Director's Pioneer Award Symposium, Sept. 22-23 2008 at NIH, Bethesda, MD.

"A split-tetra-Cysteine motif binding FlAsH-EDT$_2$ can serve as a "molecular proximity sensor" in vivo" Beena Krishnan and Lila M Gierasch, at the 21st Annual Protein Society meeting, July 2007 at Boston, MA.

"Methods to watch a β-clam protein fold in the cell" Beena Krishnan, Aneta Szymanska, and Lila M Gierasch LM, at the 2006 FASEB Summer Research Conference, protein folding in the cell, July 2006, held at Vermont.

" Effect of signal peptide on the stability and folding kinetics of Maltose Binding Protein" K. Beena , Jayant B. Udgaonkar and R. Varadarajan, at the 48th Biophysical Society annual meeting, Feb. 2004 at Baltimore, MD.

Short course

4th Hands-on Workshop on "Making single molecule fluorescence (lifetime) measurements simple" at the Center for Biophotonics in Sacramento, Jan. 22 – 23, 2009.

Conference participation

Eighth Johns Hopkins Folding Meeting, March 2005 at St. Michaels, MD.

International Symposium on Molecules, Machines and Networks, January 2004.

The 3rd Transcription Assembly meeting held at IISc, Bangalore in 1999.

XIII International Biophysics Congress held at New Delhi in Sept. 1999.

AWARDS & HONORS

- CSIR-UGC NET fellowship, Dec. 1999, for Junior Research Fellowships as well as Lectureship
- 98.6 Percentile Score in the Graduate Aptitude Test in Engineering, GATE-1998, in the Biological Sciences discipline, conducted on behalf of the Ministry of Human Resources & Development, Government of India
- Studentship from the Ministry of Human Resources & Development, Government of India, for the duration of the Masters program in Biotechnology

- Ranked second in MSc. Biotechnology from Indian Institute of Technology, Powai, Mumbai
- Ranked third in BSc. Chemistry from Pune University, received a studentship from the university for the duration of the Masters program in Chemistry
- Ranked first in BSc. Chemistry at Fergusson College, and awarded various named prizes