



Dr. Chandana Barat

Department: Biotechnology

Designation: Assistant Professor

Qualifications: M. Sc. (Biochemistry), University of Calcutta.

Ph. D. (Biochemistry, Molecular Biology), Indian Institute of Science, Bangalore, India

Email ID: chandanasgb@yahoo.com

Area of Research Interest:

Study of protein folding and aggregation

Awards and Fellowships

Nov. 1996: Best poster award at the 65th Annual Conference of the Society of Biological Chemists held at Bangalore, India.

Aug. 1992 - Dec. 1998: Junior and Senior Research Fellowships and Lectureship by the University Grants Commission, New Delhi, India.

Mar. 1992: Qualified the Graduate Aptitude Test in Engineering (GATE), held by Indian Institute of Technology (IIT).

Jan. 1992: University of Calcutta Merit Scholarship for securing third rank in M. Sc.

Aug. 1991: Shanti Devi Merit Certificate for best dissertation in M. Sc.

Publications

1. Banerjee, S., Ferdosh, S., Ghosh, A. N., & **Barat, C.** (2020). Tau protein-induced sequestration of the eukaryotic ribosome: Implications in neurodegenerative disease. *Scientific reports*, 10(1), 1-15. Impact Factor: 3.998
2. Ferdosh, S., Banerjee, S., Pathak, B. K., Sengupta, J., & **Barat, C.** (2020). Hibernating ribosomes exhibit chaperoning activity but can resist unfolded protein-mediated subunit dissociation. *The FEBS Journal*. Impact Factor: 4.739
3. Pathak, B. K., Mondal, S., Banerjee, S., Ghosh, A. N., & **Barat, C.** (2017). Sequestration of ribosome during protein aggregate formation: contribution of ribosomal RNA. *Scientific reports*, 7(1), 1-14. Impact Factor: 3.998
4. Pathak, B. K., Banerjee, S., Mondal, S., Chakraborty, B., Sengupta, J., & **Barat, C.** (2017). Unfolded protein exhibits antiassociation activity toward the 50S subunit facilitating 70S ribosome dissociation. *The FEBS journal*, 284(22), 3915-3930. Impact Factor: 4.739.
5. B K Pathak¹, S Mondal¹, **C Barat**¹ (2017) Inhibition of Escherichia coli ribosome subunit dissociation by chloramphenicol and Blastidicin: a new mode of action of the antibiotics Lett Appl Microbiol Jan;64(1):79-85. Impact Factor: 2.173
6. Surojit Mondal, Bani Kumar Pathak, Sutapa Ray and **Chandana Barat** (2014) Impact of P-Site tRNA and Antibiotics on Ribosome Mediated Protein Folding: Studies Using the *Escherichia coli* Ribosome PLoS One.2014; 9(7): e101293. Impact Factor: 2.740
7. B. K. Pathak, S. Mondal, A.N Ghosh C.Barat (2014) The Ribosome Can Prevent Aggregation of Partially Folded Protein Intermediates: Studies Using the Escherichia coli Ribosome PLoS ONE 2014;9(7):e101293. Impact Factor: 2.740
8. MR Sharma , A. Dönhöfer, **C. Barat**, V. Marquez, P.P. Datta, P. Fucini, D.N. Wilson ,R.K. Agrawal (2010) PSRP1 is not a ribosomal protein, but a ribosome-binding factor that is recycled by the ribosome-recycling factor (RRF) and elongation factor G(EF-G). J Biol Chem. 285(6):4006-14. Impact Factor: 5.328.
9. M.R. Sharma, D.N. Wilson, P.P Datta, **C. Barat**, F. Schluenzen, P. Fucini, R.K. Agrawal (2007) Cryo-EM study of the spinach chloroplast ribosome reveals the structural and functional roles of plastid-specific ribosomal proteins. Proc Natl Acad Sci U S A. 104(49):19315-20. Impact Factor: 9.771
10. **C. Barat**, P.P. Dutta, S. Raj, M.R.Sharma, H. Kaji, A. Kaji, R.K. Agrawal (2007) Progression of the ribosome recycling factor through the ribosome dissociates the two ribosomal subunits. Mol. Cell, 27, 250 -261. Impact Factor: 14.0
11. M. R. Sharma*, **C. Barat***, D. N. Wilson*, T. M. Booth, M. Kawazoe, C. H. Takemoto, S. Yokoyama, P. Fucini, and R. K. Agrawal (2005) Interaction of the highly conserved bacterial GTPase, ERA, with the small ribosomal subunit: Functional

implications for the 30S assembly. *Mol.Cell* , 18: 319-329. Impact Factor: 14.0

* these authors contributed equally

12. **C. Barat**, L. Simpson, E. Breslow (2004) Properties of human vasopressin precursor constructs: inefficient monomer folding in the absence of copeptin as a potential contributor to diabetes insipidus. *Biochemistry*, 43: 8191-203. Impact Factor: 3.226.

13. P. Pattanaik, G. Ravindra, **C. Sengupta**[†], K. Maithal, P. Balaram, H. Balaram (2003), Unusual fluorescence of W168 in Plasmodium falciparum triosephosphate isomerase, probed by single-tryptophan mutants. *Eur. J. Biochem.* ,270: 745-756. . Impact Factor: 3.451

14. **C. Sengupta**[†] and R.R. Dighe (2000), Biological activity of single chain chorionic gonadotropin, hCG alpha-beta, is decreased upon deletion of five carboxy-terminal amino acids of the alpha subunit without affecting its receptor binding. *J. Mol. Endocrinol.*, 24: 157-164. Impact Factor: 2.727

15. **C. Sengupta**[†] and R.R. Dighe (1999), Hyperexpression of biologically active human chorionic gonadotropin using the methylotropic yeast, Pichia pastoris. *J. Mol. Endocrinol.*, 22, 273-283. Impact Factor: 2.727

Sengupta: Maiden Name

Abstracts presented

Bani Kumar Pathak*, Senjuti Banerjee, Surojit Mandal, Biprashekhkar Chakraborty, Jayati Sengupta and **Chandana Barat**; *Correlation between Ribosome Chaperoning and Subunit Dissociation*; Poster presented in December 2019 at Nascent Chains in Berlin 2019, Charité in Berlin, Germany.

Senjuti Banerjee*, Sehnaz Ferdosh*, Amar Nath Ghosh and **Chandana Barat**; *In vitro effects of tau protein on the ribosome: Implications in Alzheimer's Disease*; Poster presented in May 2019 at RNA meeting 2019, Rajiv Gandhi Centre for Biotechnology, Trivandrum, Kerala.

Sehnaz Ferdosh*, Senjuti Banerjee* and **Chandana Barat**; *Unfolded protein mediated dissociation of ribosomal subunit: Effect of stress factors and molecular chaperones*; Poster presented in May 2019 at RNA meeting 2019, Rajiv Gandhi Centre for Biotechnology, Trivandrum, Kerala.

Senjuti Banerjee*, Bani Kumar Pathak*¹, Sehnaz Ferdosh* and **Chandana Barat***; *Implications of association of YfiA and unfolded protein with E.coli ribosome under stressed conditions*; Poster presented in October 2017 at RNA meeting 2017, Banaras Hindu University, Varanasi

Pathak, K. B., Mondal, S., **Barat, C.** Folding of molten globule form of BCaII bydomain V of ribosomal 23S rRNA.- Accepted for a poster presentation at the 80th Annual Meeting of the Society of Biological Chemists(SBC) to be held at CSIR-CIMAP, Lucknow, during 12 – 15 November 2011.

Mondal, S., Pathak, K.B., **Barat, C.** Two step post-translational release of folding competent protein from ribosome involves distinct nucleotide determinants- Accepted for a poster presentation at the 80th Annual Meeting of the Society of Biological Chemists (SBC) to be held at CSIR-CIMAP, Lucknow, during 12 – 15November 2011.

Barat, C., Datta, P.P., Raj, V.S., Sharma, M.R., Kaji, H., Kaji, A., & Agrawal, R.K. (2006). Progression of the ribosome recycling factor (RRF) through the ribosome dissociates the ribosomal subunits. Meeting on "Translational Control" Cold Spring Harbor Laboratory, New York, USA, Abst. No. 350.

Wilson, D.N., Sharma, M.R., **Barat, C.**, Booth, T.M., Kawazoe, M., Hori-Takemoto, C., Shirouzu, M., Yokoyama, S., Fucini, P., & Agrawal, R.K. (2005). A control checkpoint for translation initiation: The role of Era during small ribosomal subunit assembly. EMBL Meeting on "Translational Control", Hiedelberg, Germany. Abst. No. 171.

Barat, C., Datta, P.P., Raj, V., Kaji, H., Kaji, H., & Agrawal, R.K. (2005). Movement of Ribosome Recycling Factor on the Ribosome Dissociates Ribosomal Subunits. 21st International tRNA Workshop, Bangalore, India. Manjuli R. Sharma*,

Chandana Barat* , Daniel N. Wilson*, Timothy M. Booth, Masahito Kawazoe, Chie Hori- Takemoto, Shigeyuki Yokoyama, Paola Fucini, and Rajendra K. (2004) ERA Protein Binds in a Functionally Important Region of the 30S Ribosomal Subunit Poster presented at the RNA Society Meeting.

C. Barat, L. Simpson and E. Breslow. (2004) Folding of Human Vasopressin Precursor: Potential Importance of the Stability of the Initial Folded Product in Protein Folding Pathways. Poster presented at the 48th Annual Meeting of Biophysical Society, Baltimore, Maryland.

M. R. Sharma*, **C. Barat***, D. N. Wilson*, T. M. Booth, M. Kawazoe, C. Hori-Takemoto, S. Yokoyama, P. Fucini, and R. K. (2004) ERA Protein Binds in a Functionally Important Region of the 30S Ribosomal Subunit Poster presented at the 48th Annual Meeting of Biophysical Society, Baltimore, Maryland. (* these authors contributed equally)

C. Barat and E. Breslow (2003) Folding properties of human vasopressin precursor and its 87STOP mutant 47th Annual Meeting of Biophysical Society, San Antonio, TX., Abstract no:2395-Plat .

R.R. Dighe, **C. Sengupta**[†], V. Nalwadi, M. Samaddar, J. Catterral (1997), Expression of FSH, hCG and FSH receptor using Pichia pastoris expression vector", Oral Presentation at the Gene Expression Meeting San Diego, CA.

C. Sengupta[†] and R.R. Dighe (1996), Expression of individual and translationally fused hCG subunits using

Pichia pastoris expression system, Poster presented at the 65th Annual meeting of the [SBC(I)].

R.R. Dighe, M. Samaddar, C. Sengupta[†] (1995), Recombinant DNA Expression of Follicle stimulating Hormone and human chorionic gonadotropin in the yeast, *Pichia pastoris*”, **Oral Presentation at the International Endocrinology Congress, San Francisco, CA.**

C. Sengupta[†] and R.R. Dighe (1995), Recombinant DNA expression of human chorionic gonadotropin subunits in the yeast *Pichia pastoris*, **Poster presented at the 64th Annual Meeting of the Society of Biological Chemists of India, [SBC(I)].**[†]Maiden name

Conferences Attended

Jan 2016: Participated in the RNA Meeting, CCMB, Hyderabad, India.

Jan 2015: Participated in Biotica 2015, Center for Nanotechnology, India.

Jan. 2014: Participated in the RNA Meeting, Indian Institute of Chemical Biology, India.

Feb. 2004: Participated in the 48th Annual Meeting of Biophysical Society, Baltimore, Maryland. **Jun. 2001:**

Participated in the 4th Summer session of the New York Structural Biology Group, ColdSpring Harbor Laboratory, NY.

Dec. 1996: Participated in the winter school on “Protein Folding and Design” organized by Tata Institute of Fundamental research, Bombay, India.

Aug. 1996: Participated in the Conference on “Endocrinology, Metabolism and Diabetes”, IISc, Bangalore.

List of Projects implemented/completed/submitted:

Grant agency	Title of the proposed project and Reference number	Duration, (from mm/yy to mm/yy)
University Grants Commission	ROLE OF UNIVERSALLY CONSERVED A2602 OF BACTERIAL 23S RIBOSOMAL RNA IN THE RELEASE OF NASCENT PEPTIDE DURING RIBOSOME MEDIATED PROTEIN FOLDING	3 years April 2008-March 2011
Council for Scientific and Industrial Research	EFFECT OF ANTIBIOTICS AND TRNA ON RIBOSOME MEDIATED PROTEIN FOLDING	3 years April 2008-March 2011 (further extension period of one year has been granted by CSIR)
Department of Biotechnology, West Bengal	COMPARISON OF CHAPERONE ACTIVITIES ON REFOLDING OF AGGREGATION PRONE PROTEIN FOLDING INTERMEDIATES	3 years, April 2012-March 2015
Department of Science and Technology, India	EFFECT OF TRANSLATIONAL SPEED AND CHAPERONES ON FOLDING OF RECOMBINANT GREEN FLUORESCENT PROTEIN AND FIREFLY LUCIFERASE IN <i>Escherichia coli</i>	3 years, April 2013-March 2016
Department of Higher Education, Science & Technology and Biotechnology, Government of West Bengal	EFFECT OF THE RIBOSOME AND ITS ASSOCIATED CHAPERONES ON PROTEIN AGGREGATION SYSTEMS: STUDIES USING <i>ESCHERICHIA COLI</i> AND <i>SACCHAROMYCES CEREVISIAE</i> RIBOSOME.	3 years, December 2016 – March 2019
Science and Engineering Research Board (SERB) (Department of Science and Technology, India)	STUDIES ON RIBOSOMAL RNA MEDIATED STIMULATION OF ALZHEIMER’S DISEASE ASSOCIATED TAU PROTEIN AGGREGATION AND THE INTERACTION OF TAU WITH THE RIBOSOME.	3 years August, 2018-August 2021

Name of Research Fellow: Ms. Senjuti Banerjee,
Ms. Sehnaz Ferdosh

PhD. Students : 2 (awarded)

