

CURRICULUM VITAE

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Education

Ph.D, 2000 (Biochemistry & Molecular Biology), Jadavpur University, Calcutta, India.

M.Sc, 1993 (Physics), Indian Institute of Technology, Kharagpur, India.

B.Sc, 1991 (Physics Honors.) Calcutta University, Calcutta, India.

Working experience

- 2015 - Associate Professor, Department of Chemistry, Bose Institute, Kolkata, India.
(Mentoring Ph.D scholars and Master students for their dissertation research, publish articles on scientific findings, writing research grants for extramural funding, teaching masters students in life science)
- 2009 - 2015 Assistant Professor, Department of Chemistry, Bose Institute, Kolkata, India.
(Mentoring Ph.D scholar and Master students for their dissertation research, publish articles on scientific findings, writing research grants for extramural funding, teaching masters students in life science)
- 2007- 2008 Research Specialist II, Howard Hughes Medical Institute, Waksman Institute, Rutgers University, Piscataway, NJ-08854.
(Conducting research on various projects to understand the fundamental mechanism of transcription and RNA polymerase –inhibitors interactions)
- 2005 - 2007 Research Specialist I, Howard Hughes Medical Institute, Waksman Institute, Rutgers University, Piscataway, NJ-08854.
(Conducting research on various projects to understand the fundamental mechanism of transcription and RNA polymerase –inhibitors interactions)
- 2000 - 2005, Postdoctoral Associate, Howard Hughes Medical Institute, Waksman Institute, Rutgers University, Piscataway, NJ-08854. (advisor: Dr. Richard H. Ebright).
(Conducting research on various projects to understand the fundamental mechanism of transcription and RNA polymerase –inhibitors interactions)
- 1994 -1999, Research Fellow, Department of Biochemistry, Bose Institute, Calcutta, India.
(Conducting research for Ph.D dissertation)

Awards

Howard Hughes Medical Institute Postdoctoral Associate, 2000.

Council of Scientific and Industrial Research (Govt. of India) predoctoral fellowship, 1994-99.
Graduate Aptitude Test Examination, 1993.
National Scholarship, 1988.

Representative publications

1. Prajapati RK, Sur R, **Mukhopadhyay J***. A Novel function of δ factor from *Bacillus subtilis* as a transcriptional repressor **(2016) J Biol Chem.** 291(46): 24029-24035.
2. Datta A, Yadav V, Ghosh A, Choi J, Bhattacharyya D, Kar R K, Ilyas H, Dutta A, An E, **Mukhopadhyay J**, Lee D, Sanyal K, Ramamoorthy A, and Bhunia A. Mode of Action of a Designed Antimicrobial Peptide: High Potency Against *Cryptococcus neoformans*. **(2016) Biophysical Journal** 111: 1724–1737
3. Roy A, Dutta A, Roy D, Ganguly P, Ghosh R, Kar RK, Bhunia A, **Mukhopadhyay J**, and Chaudhuri S. Deciphering the role of the AT-rich interaction domain and the HMG-box domain of ARID-HMG proteins of *Arabidopsis thaliana*. **(2106) Plant Molecular Biology** 92(3):389-390.
4. Prajapati RK, Sengupta S, Rudra P, **Mukhopadhyay J**. *Bacillus subtilis* δ Factor Functions as a Transcriptional Regulator by Facilitating the Open Complex Formation. **(2016) J Biol Chem.** 291(3):1064-75.
5. Promoter escape with bacterial two-component sigma factor suggests retention of sigma region two in the elongation complex. Sengupta S, Prajapati RK, and **Mukhopadhyay J**. **(2015) J Biol Chem.** 290(47):28575-83.
6. Rudra P, Prajapati RK, Banerjee R, Sengupta S, and **Mukhopadhyay J***. Novel mechanism of gene regulation: the protein Rv1222 of *Mycobacterium tuberculosis* inhibits transcription by anchoring the RNA polymerase onto DNA. **(2015) Nucleic Acid Research**, 43: 5855-67.
7. Saha A, **Mukhopadhyay J**, Datta AB, Parrack P. Revisiting the mechanism of activation of cyclic AMP receptor protein (CRP) by cAMP in *Escherichia coli*: Lessons from a subunit-crosslinked form of CRP. **(2015) FEBS Letters** 589: 358–363.
8. Sharma AK, Chatterjee A, Gupta S, Banerjee R, Mandal S, **Mukhopadhyay J**, Basu J, Kundu M. MtrA, an essential response regulator of the MtrAB two component system regulates the transcription of resuscitation promoting factor B (RpfB) of *Mycobacterium tuberculosis*. **(2015) Microbiology** 161(6):1271-81.
9. Banerjee R, Rudra ., Saha A, and **Mukhopadhyay J**. Recombinant Reporter Assay Using Transcriptional Machinery of *Mycobacterium tuberculosis*. **(2015) Journal of bacteriology** 197, 646-653.
10. Banerjee R, Rudra P, Prajapati, RK, Sengupta S., and **Mukhopadhyay J**. Optimization of recombinant *Mycobacterium tuberculosis* RNA polymerase expression and purification. **(2014) Tuberculosis (Edinb)** 94:397-404.
11. *Polyphosphate kinase 1, a central node in the stress response network of Mycobacterium tuberculosis, connects the two-component systems MprAB, SenX3-Reg X3 and the extra-cytoplasmic function sigma factor, Sigma E.* Sanyal S, Banerjee, S K Banerjee, R, **Mukhopadhyay J**, Kundu, M. **(2013) Microbiology** 159: 2074-86.
12. **Mukhopadhyay J**, Das K, Ismail S, Koppstein D, Jang M, Hudson B, Sarafianos S, Tuske S, Patel J, Jansen R, Irschik H, Arnold E, Ebright RH. The RNA polymerase "switch region" is a target for inhibitors. **Cell (2008)** 135(2): 295-307.

13. Pavlova O, **Mukhopadhyay J**, Sineva E, Ebright RH, Severinov K. Systematic structure-activity analysis of microcin J25. *J Biol Chem* (2008) 283: 25589-95.
14. Margeat E, Kapanidis AN, Tinnefeld P, Wang Y, **Mukhopadhyay J**, Ebright RH, Weiss S. Direct observation of abortive initiation and promoter escape within single immobilized transcription complexes. *Biophys J.* (2006) 90:1419-31.
15. Kapanidis AN, Margeat E, Laurence TA, Doose S, Ho SO, **Mukhopadhyay J**, Kortkhonjia E, Mekler V, Ebright RH, Weiss S. Retention of transcription initiation factor σ^{70} in transcription elongation: single-molecule analysis. *Mol Cell* (2005) 20: 347-56.
16. Tuske S, Sarafianos S, Wang X, Hudson B, Sineva E, **Mukhopadhyay J**, Leroy O, Ismail S, Clarke A, Birktoft Jr. J, Dharia C, Napoli A, Laptenko O, Lee J, Berman H, Borukhov S, Ebright RH, and Arnold E. Inhibition of bacterial RNA polymerase by streptolydigin: stabilization of a straight-bridge-helix active-center conformation. *Cell* (2005) 122, 541-552.
17. Lee NK, Kapanidis AN, Wang Y, Michalet X, **Mukhopadhyay J**, Ebright RH, Weiss S. Accurate FRET measurements within single diffusing biomolecules using alternating-laser excitation. *Biophys J* (2005) 88, 2939-53.
18. Knight JL, Mekler V, **Mukhopadhyay J**, Ebright RH, Levy RM. Distance-restrained docking of rifampicin and rifamycin SV to RNA polymerase using systematic FRET measurements: developing benchmarks of model quality and reliability. *Biophys J* (2005) 88, 925-38.
19. **Mukhopadhyay J**, Sineva E, Knight J, Levy RL, Ebright RH. Antibacterial peptide microcin J25 (MccJ25) inhibits transcription by binding within, and obstructing, the RNA polymerase secondary channel. *Mol Cell* (2004) 14, 739-751.
20. Nickels BE, **Mukhopadhyay J**, Garity SJ, Ebright RH, Hochschild A. The σ^{70} subunit of RNA polymerase mediates a promoter proximal pause at the *lac* promoter. *Nat Struct Mol Biol*,(2004) 11, 544-550.
21. Bayro MJ, **Mukhopadhyay J**, Swapna GV, Huang JY, Ma LC, Sineva E, Dawson PE, Montelione GT, Ebright RH. Structure of antibacterial peptide microcin J25: a 21-residue lariat protoknot. *J Am Chem Soc* (2003) 125,12382-3.
22. Mekler V, Kortkhonjia E, **Mukhopadhyay J**, Knight J, Revyakin A, Kapanidis AN, Niu W, Ebright YW, Levy R, Ebright RH. Structural organization of bacterial RNA polymerase holoenzyme and the RNA polymerase-promoter open complex. *Cell* (2002) 108, 599-614 (equally contributed).
23. **Mukhopadhyay J**, Kapanidis AN, Mekler V, Kortkhonjia E, Ebright YW, Ebright RH. Translocation of σ^{70} with RNA polymerase during transcription: fluorescence resonance energy transfer assay for movement relative to DNA. *Cell* (2001) 106, 453-63.
24. Sur R, Debnath D, **Mukhopadhyay J**, Parrack P. A novel RNA polymerase binding site upstream of the galactose promoter in *Escherichia coli* exhibits promoter-like activity. *Eur J Biochem*, (2001) 268, 2344-50.
25. **Mukhopadhyay J**, Sur R, Parrack P. Functional roles of the two cyclic AMP-dependent forms of CRP (cyclic AMP Receptor Protein) from *Escherichia coli*. *FEBS Letters* (1999) 453, 215-218.

Review Aricles

1. Srivastava A, Talaue M, Liu S, Degen D, Ebright RY, Sineva E, Chakraborty A, Druzhinin SY, Chatterjee S, **Mukhopadhyay J**, Ebright YW, Zozula A, Shen J, Sengupta S, Niedfeldt RR, Xin C, Kaneko T, Irschik H, Jansen R, Donadio S, Connell N, Ebright RH. New target

for inhibition of bacterial RNA polymerase: 'switch region'. ***Curr Opin Microbiol.*** (2011),14: 532-43.

2. **Mukhopadhyay J**, Mekler V, Kortkhonjia E, Kapanidis AN, Ebright YW, Ebright RH. Fluorescence resonance energy transfer (FRET) in analysis of transcription-complex structure and function. ***Methods Enzymol*** (2003) 371, 144-159.

Book Chapter

Mukhopadhyay J and Sur R. Recent Trends in Gene Expression and Regulation' *Mechanism of transcription in prokaryote.* ***Nova science publishers***, Inc, (2013) Hauppauge, NY, USA.

Patents

1. Ebright RH, **Mukhopadhyay J**, Simenova E, and Severinov K (2013): Non-MccJ25 related lariat peptide inhibitors of bacterial RNA polymerase: Patent: US8354246B2

Research support

Department of Bio-Technology, Govt.of India

17/6/2010- 16/6/2013

PI: Jayanta Mukhopadhyay

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Goal: To identify the genes regulated by *Mycobacterium tuberculosis* sigma factors.

Department of Bio-Technology, Govt.of India

14/10/2013- 13/10/2016

PI: Jayanta Mukhopadhyay

Total amount: Rs 78,03,600

Goal: Characterization and design of inhibitors of *Mycobacterium tuberculosis* transcription