

Kaustuv Datta, Ph.D.

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Education

Ph.D., Molecular, Cellular and Developmental biology, University of Michigan, Ann Arbor **2005**
Master of Science (M. Sc.), Biotechnology, Indian Institute of Technology, Mumbai, India **1997**
Bachelor of Science (B. Sc.), Chemistry Honors, University of Delhi, New Delhi, India **1995**

Research Experience

Associate Professor , Department of Genetics University of Delhi, South Campus	2021-till date
Assistant Professor , Department of Genetics University of Delhi, South Campus	2010-2021
Postdoctoral fellow in the laboratory of Dr. Larry Gerace The Scripps Research Institute	2006-2010
Postdoctoral fellow in the laboratory of Dr. Janine Maddock University of Michigan, Ann Arbor	2005
Graduate student in the laboratory of Dr. Janine Maddock University of Michigan, Ann Arbor.	1998-2005

Research Statement

Mitochondrial health is key to cellular fitness and any aberration leads to myriad of diseases. Our lab uses *Saccharomyces cerevisiae* as a model organism to understand basic principles governing mitochondrial ribosomes biogenesis and how their activity during translation of essential oxidative phosphorylation subunits encoded by the mitochondrial genome is regulated in response to altered metabolic cues. We have shown that a yeast clade specific RNA helicase Irc3p is involved in regulating mitochondrial translation elongation in response to metabolic cues. In addition, we have shown that Mtg3p, the mitochondrial member of cpGTPase, associates with 37S small subunit and controls recruitment of mRNA molecule during translation initiation. Finally, we have shown that Mrx8p is involved in optimal synthesis of mitochondrially encoded Cox1p under cold stress and its function is conserved in yeast and humans.

Publications

Verma Y, Mehra U, Pandey DK, Kar J, Perez-Martinez X, Jana SS, **Datta K** (2021). *MRX8*, the conserved mitochondrial YihA GTPase family member is required for de novo Cox1 synthesis at suboptimal temperatures in *Saccharomyces cerevisiae* *Mol. Biol. Cell.* 2021 Nov 1;32(21):ar16
ISSN:1939-4586

Kaur J, **Datta K** (2021). *IRC3* regulates mitochondrial translation in response to metabolic cues in *Saccharomyces cerevisiae* *Mol. Cell. Bio.* 2021 Oct 26;41(11):e0023321 ISSN:1098-5549

Mehra U, Kaur J, Pandey D, **Datta K**. (2017) A yeast specific insertion amidst OBG fold is critical for mitochondrial function of Mtg2p in *Saccharomyces cerevisiae*. *J.P.P* 8(2) 75-84 ISSN: 2524-4663

Huber M.D, Vesely P.W., **Datta K** and Gerace L. (2013) Erlins restrict SREBP activation in the ER and regulate cellular cholesterol homeostasis. *J. Cell Biol.* 203(3): 427-436 ISSN; 0021-9525

Datta K, Guan T, Gerace L. (2009) NET37, a nuclear envelope transmembrane protein with glycosidase homology, is involved in myoblast differentiation *J. Biol. Chem.* Oct 23;284(43):29666-76
ISSN:1083-351X (web)

Liu G, Guan T, **Datta K**, Coppinger J, Yates J3rd, Gerace L. (2009) Regulation of Myoblast Differentiation by the Nuclear Envelope Protein NET39. *Mol Cell Biol.* Nov;29(21):5800-12.
ISSN:1098-5549 (web)

Fuentes JL, **Datta K**, Sullivan SM, Walker A, Maddock JR. (2007) In vivo functional characterization of the *Saccharomyces cerevisiae* 60S biogenesis GTPase Nog1. *Mol Genet Genomics*. 278(1):105-123. ISSN:1617-4615

Sikora AE, **Datta K**, Maddock JR. (2006) Biochemical properties of the *Vibrio harveyi* CgtA_v GTPase. *Biochem. Biophys. Res. Commun.* 339(4):1165-70. ISSN:0006-291X

Sikora AE, Zielke R, **Datta K**, Maddock JR. (2006) The *Vibrio harveyi* GTPase CgtA_v is essential and is associated with the 50S ribosomal subunit. *J. Bacteriol.* 188(3):1205-10. ISSN:1098-5530

Jiang M, **Datta K**, Walker A, Strahler J, Bagamasbad P, Andrews PC, Maddock JR. (2006) The *Escherichia coli* GTPase CgtAE is involved in late steps of large ribosome assembly. *J. Bacteriol.* 188(19): 6757-70. ISSN:1098-5530

Datta K, Fuentes JL, Maddock JR. (2005) The yeast GTPase Mtg2p is required for mitochondrial translation and partially suppresses an rRNA methyltransferase mutant, *mrm2*. *Mol. Biol. Cell.* 16(2):954-63. ISSN:1939-4586

Datta K, Skidmore JM, Pu K, Maddock JR. (2004) The *Caulobacter crescentus* GTPase CgtA_c is required for progression through the cell cycle and for maintaining 50S ribosomal subunit levels. *Mol. Microbiol.* 54(5):1379-92 ISSN: 365-2958 (web)

Oral Presentation

Datta K. Regulation of mitochondrial gene expression in response to growth conditions: Tale of accessory factors governing Cox1p synthesis in *Saccharomyces cerevisiae* Virtual Symposium, University of Michigan, December 15th 2020

Datta K, Kaur J. Mitochondrial gene expression in response to carbon source: control by a yeast clade specific putative helicase *IRC3* in *Saccharomyces cerevisiae*. International Conference of Yeast and Filamentous Fungi, University of Hyderabad (Hyderabad) from 27th to 29th November, 2019

Datta K, Mehra U, Verma Y, Sharma K, Nair A. Regulators of mitochondrial ribosome assembly/activity in response to cellular energy requirements. Yeast Meeting , JNU/Amity, Delhi JNU 8th to 11th February 2018

Datta K, Mehra U, Pandey D. Mitochondrial ribosome function/assembly: Regulation by accessory factors in *Saccharomyces cerevisiae*. International Conference on Yeast Biology, Kolkata Dec 11th 2015

Datta K, Mehra U, Pandey D. Mitochondrial ribosome function/assembly: Regulation by accessory factors in *Saccharomyces cerevisiae*. 38th Mahabaleshwar Seminar on Mitochondria, Energetics and Metabolism during 27th - 30th January 2014

Datta K, Maddock JR. Role of Yhr168wp in mitochondrial ribosome functions. 6th International Conference on Ribosome synthesis. June 2003, Archaeon, France.

Poster Presentation

Mehra U, Verma Y, Pandey D, Nair A, **Datta K**. Regulators of mitochondrial ribosome assembly and translation in response to cellular energy requirements in *Saccharomyces cerevisiae*. Gordon Research Conference on Mitochondria and Chloroplasts held July 2018, Lucca (Barga), Italy.

Kaur J, Pandey D, **Datta K**. Mitochondrial ribosome function/assembly: Regulation by accessory factors in *Saccharomyces cerevisiae*. Yeast Genetics Meeting held from July 29 – August 3, 2014 at the University of Washington, Seattle, USA

Datta K, Guan T, Gerace L. NET37, a nuclear envelope transmembrane protein with glycosidase homology, is involved in myoblast differentiation. Annual meeting, American Society of Cell Biology, December 2009, San Diego, CA.

Datta K, Guan T, Huber M, Gerace L. Role of the nuclear envelope localized glycosidase NET37 in myogenesis. Cold spring Harbor meeting titled “Dynamic organization of nuclear function” October 2008, CSHL, NY.

Datta K, Guan T, Huber M, Gerace L. Characterization of nuclear membrane proteins with putativeroles in lipid signaling. 13th Annual San Diego Cell Biology Meeting. April 2007, Salk Insitute, San Diego, CA.

Datta K, Maddock JR. Characterization of Yhr168wp, a mitochondrial GTP-binding protein in *S. cerevisiae*. Yeast Genetics and Molecular Biology Meeting. August 2002, Madison, WI.

Teaching Statement

Teaching allows me to share my knowledge and experiences with students, thus contributing towards their skill development, while simultaneously giving me immense professional satisfaction. I have structured my courses and research laboratory such that we can continuously challenge our scientific dogmas. I have created an atmosphere of reciprocal relationship with my students, wherein we both learn and get energized by our shared creativity and fresh insights. This has led to a healthy learning environment and I hope to sustain and nurture this in future as well.

Current courses

Cell Biology

Microbial Genetics

Yeast Molecular Biology

Student supervision at University of Delhi, South campus

Upasna Mehra (Ph. D 2018)

Dharmendra Pandey (Ph. D, 2018)

Jaswinder Kaur (Ph. D, 2021)

Yash Verma (Ph. D Student, ongoing)

Ritika Kapila (Ph. D Student, ongoing)

Anagha Nair (M.Phil. 2017)

Khushboo Sharma (M.Phil. 2017)

Arpita Das (M.Phil. Student, 2016)

Shweta Jakar (M.Phil. Student, 2015)

Deeksha Srivastava (M.Phil. ongoing)

Research Projects

- Functional characterization of a novel GTPase *YOR205c (GEP3)*, a mitochondrial ribosome associated factor in *Saccharomyces cerevisiae* **DBT-RGYI: 2011-2014**
- To characterize the potential role of a putative mitochondrial GTPase *YDR336w*, in regulating mitochondrial ribosome function in *Saccharomyces cerevisiae* **CSIR: 2012-2015**
- Regulation of mitochondrial ribosome assembly by a novel Obg GTPase family member, *MTG2*, in *Saccharomyces cerevisiae* **DBT: 2012-2015**
- Regulation of mitochondrial function by a novel yeast clade specific DExH/D box helicase, *YDR332w (IRC3)*, in *Saccharomyces cerevisiae* **SERB: 2016-2019**
- Elucidating the control exerted on mitochondrial activity by *YDR336w(MRX8)*, a nuclear-encoded GTPase in *Saccharomyces cerevisiae* **BRNS: 2017-2020**
- To decipher the link between function of yeast clade specific mitochondrial RNA helicases and virulence of opportunistic pathogen *Candida albicans* **CSIR: 2017-2020**
- Investigating the mechanism of *Irc3p* function to regulate carbon source dependent mitochondrial translation in *Saccharomyces cerevisiae* **SERB: 2021-2024**

University and Community service

Selection committee member DBT-RA fellowship (2013-2019)

Warden Aravalli Men's P.G. Hostel (2012- 2015)

Departmental Purchase committee (2014- till date)