

**Vaishnavi Ananthanarayanan, Ph.D.**  
**EMBO Young Investigator**  
**Wellcome Trust/DBT-India Alliance Intermediate Fellow**

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**EMPLOYMENT**

- **Assistant Professor** Oct 2017-present  
*Centre for BioSystems Science and Engineering, Indian Institute of Science, Bangalore*
- **DST INSPIRE Faculty Fellow** June 2014-Oct 2017  
*Equivalent to Group Leader, funded through the Dept. of Science and Technology (India)*  
*Centre for BioSystems Science and Engineering, Indian Institute of Science, Bangalore*
- **Research Assistant** June 2009- June 2010  
*Microsoft Research India, Bangalore*

**EDUCATION**

- **Ph.D. Biophysics** July 2010- Jan 2014  
*Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany*
- **B.E. (Hons.) Computer Science and M.Sc. (Hons.) Biological Sciences** (dual degree) Aug 2004- Aug 2009  
*Birla Institute of Technology and Science, Pilani, India (CGPA: 9.28/10)*

**PUBLICATIONS**

**Research Articles/Reviews**

2020 • Shah, M., Chacko, L. A., Joseph, J. P., **Ananthanarayanan, V.**\* Mitochondrial dynamics, positioning and function mediated by cytoskeletal interactions. *Cell Mol. Life Sci.* [Invited review, under review]

• Tirumala, A. T.\* and **Ananthanarayanan, V.**\* Role of dyactin in the intracellular localization and activation of cytoplasmic dynein. *Biochemistry* [Invited review as a part of Future of Asia-Pacific Special Issue]

2019 • Chacko, L. A., Mehta, K., **Ananthanarayanan, V.**\* Cortical tethering of mitochondria by the anchor protein Mcp5 enables uniparental inheritance. *J. Cell Biol.* 218 (11) 3560-3571

• Mehta, K., Chacko, L. A., Chug, M. K., Jhunjhunwala, S., **Ananthanarayanan, V.**\* Association of mitochondria with microtubules inhibits mitochondrial fission by precluding activity of the fission protein Dnm1. *J. Biol. Chem.* 294(10) 3385-3396

• Chacko, L. A. and **Ananthanarayanan, V.**\* Quantification of mitochondrial dynamics in fission yeast. *Bio-protocol* 9(23): e3450.

2017 • Thankachan, J. M., Nuthalapati, S. S., Tirumala, N. A., **Ananthanarayanan, V.**\* Fission Yeast Myosin I Facilitates PI(4,5)P<sub>2</sub>-mediated Anchoring of Cytoplasmic Dynein to the Cortex. *Proc. Nat. Acad. Sci.* 114: E2672-E2681

• Meka, S., Chacko, L. A., Ravi, A., Chatterjee, K., **Ananthanarayanan, V.**\* Role of Microtubules in Osteogenic Differentiation of Mesenchymal Stem Cells on 3D Nanofibrous Scaffolds. *ACS Biomater. Sci. Eng.* 3: 551-559

2016 • **Ananthanarayanan, V.**\*, Activation of the motor protein upon attachment: Anchors weigh in on cytoplasmic dynein regulation. *Bioessays* 38(6): 514-25

2015 • **Ananthanarayanan, V.**\* and Tolić, I. Single-molecule imaging of cytoplasmic dynein in vivo. *Methods Cell Biol.* 125

2014 • Krull, A., Steinborn, A., **Ananthanarayanan, V.**, Ramunno-Johnson, D., Petersohn, U., Tolić-Nørrelykke, I.\*. A divide-and-conquer strategy for the maximum likelihood localization of low intensity objects. *Opt. Express* 22(1), 210-228

2013 • **Ananthanarayanan, V.**, Schattat, M., Vogel, S. K., Krull, A., Pavin, N.\*., Tolić-Nørrelykke, I.\*. Dynein Motion Switches from Diffusive to Directed upon Cortical Anchoring. *Cell* 153: 1526-1536

2010 • **Ananthanarayanan, V.\*** and Thies, W.\***, Biocoder: A programming language for standardizing and automating Biology protocols. *J. Biol. Eng.* 4: 13**

#### Science outreach

- **Ananthanarayanan, V.\*** Voices of the new generation: Mentorship as a junior PI. ***Nat. Rev. Mol. Cell Biol.* (2020)**
- **Ananthanarayanan, V.\*** and Mylavarapu, S. V. S.\* Meeting report – the Microtubules, Motors, Transport and Trafficking (M2T2) 2019 meeting. ***J. Cell Sci.* (2020)**
- **Ananthanarayanan, V.\*** My INSPIRE'd Journey. ***IndiaBioScience* (2019)**
- **Ananthanarayanan, V.\*** Plugging the 'Leaky Pipeline': Need for women-friendly workplaces in academia and how we can create them in the future. ***IndiaBioScience* (2019)**

\*Corresponding author(s)

#### AWARDS AND RECOGNITION

2019 Member of the Editorial Advisory Board, Journal of Cell Science  
 'Cell Scientist to Watch', Journal of Cell Science  
 Women Excellence Award, Science and Engineering Research Board (India)  
 RI Mazumdar Young Investigator Award  
 BITS Alumni Association Global 30 Under 30 Award

2018 EMBO Young Investigator  
 Wellcome Trust/DBT – India Alliance Intermediate Fellowship  
 Associate of the Indian Academy of Sciences

2016 Early Career Research Award, Science and Engineering Research Board (India)

2015 Innovative Young Biotechnologist Award, Department of Biotechnology (India)

2014 INSPIRE Faculty Award, Department of Science and Technology (India)

2007 JNCASR Summer Research Fellowship  
 Rajiv Gandhi National Talent Science Research Fellow

#### FUNDING (as Principal Investigator)

- EMBO Young Investigator Grant (2020 – until grant runs out) EUR 15,000
- Role of microtubule-mitochondrial attachment in the maintenance of cell polarity and establishment of symmetry during cell division (Science and Engineering Research Board (India), May 2019 – May 2022) ~EUR 18,900
- Role of microtubule dynamics in mitochondrial dysfunction during the progression of neurodegeneration (Wellcome Trust-DBT/India Alliance, Jan 2019 – Jan 2024) ~EUR 393,905
- Intramural grant from the Indian Institute of Science (Jan 2018 – Dec 2019) ~EUR 314,826
- Dynein behavior in vivo and the factors affecting its activation (Department of Science and Technology (India), June 2014 - June 2019) ~ EUR 108,295
- Investigation of microtubule-mediated mitochondrial positioning and partitioning (Department of Biotechnology (India), Aug 2015 – Aug 2018) ~EUR 55,620
- Characterization of the membrane-bound anchor of cytoplasmic dynein using super-resolution microscopy (Science and Engineering Research Board (India), Apr 2016-Apr 2019) ~EUR 48,295

Total ~EUR 955,841

#### TRAVEL AWARDS

- EMBO Travel Award (Frontiers in Cytoskeleton Research 2017, Pune, India)
- EMBO Conference Fee Waiver (Meiosis Meeting 2017, Hvar, Croatia)
- EMBO Conference Fee Waiver (Microtubules: Structure, Regulations and Functions Conference 2016, Heidelberg, Germany)
- DST International Travel Support (Microtubules: Structure, Regulations and Functions Conference 2014, Heidelberg, Germany)
- Max Planck Society Travel Grant (64th Lindau Nobel Laureate Meeting 2014, Germany)
- MPI-CBG Travel Grant (Annual Meeting of the American Society for Cell Biology 2012, San Francisco, USA)
- FEBS Travel Grant (27th Cytoskeletal Forum Meeting 2012, Pecs, Hungary)
- IRB Barcelona Travel Grant (2nd IRB Student Symposium 2011, Barcelona, Spain)

- Pombe 2011 Travel Grant (6th International Fission Yeast Meeting 2011, Boston, USA)
- SynBERC Travel Grant (International Workshop on Biodesign Automation 2009, San Francisco, USA)

## **CONFERENCE PARTICIPATION**

### **Invited Talks**

2020 'Mysteries of Microbes' Webinar Series, MSU Baroda, India  
 \*Vienna Doctoral School, Austria  
 \*EMBO Workshop on Birth and Fission of Cellular Compartments, Leioa, Spain (EMBO YI Lecture)  
 \*Nanoengineering for Mechanobiology, Camogli, Italy 2020 (Keynote Speaker and EMBO YI Lecture)  
 \*Biophysical Society Meeting on the Spatial Organization of Biological Functions, ICTS Bangalore, India  
 \*Statistical Biological Physics: From Single Molecule to Cell, ICTS Bangalore, India  
 (\*postponed due to COVID-19 pandemic)

2019 Center for Regenerative Therapies, Dresden, Germany  
 EMBO Young Investigator Meeting, Singapore  
 Unravelling Cellular Processes – Models and Experiments Meeting, Coorg, India  
 85<sup>th</sup> Annual Meeting of the Indian Academy of Sciences, Hyderabad, India  
 Motors, Microtubules, Trafficking and Transport Meeting, NBRC, Manesar, India  
 Discussion Meeting – Thirsting for Theoretical Biology, ICTS Bangalore, India  
 43<sup>rd</sup> Indian Biophysical Society Meeting, IISER Kolkata, India

2018 87<sup>th</sup> Annual Conference of the Society of Biological Chemists (India), Manipal, India  
 RCB Bioimaging School, RCB Faridabad, India

2017 Ruder Boskovic Institute, Zagreb, Croatia  
 Natural and Artificial Molecular Machines, IIT Bombay, India  
 Current Trends in Intracellular Trafficking and Molecular Motors, TIFR Mumbai, India  
 Mitochondria and Metabolism Networking Conference, IISER Pune, India  
 Collective Dynamics Of-, On- and Around Filaments in Living Cells: Motors, Maps, Tips and Tracks, ICTS Bangalore, India

2016 15<sup>th</sup> Anniversary Symposium of the Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany  
 Computational and Experimental Studies of Microtubules and Microtubule based Motor Proteins, IIT Bombay, India  
 Current Trends in Intracellular Trafficking and Molecular Motors, TIFR Mumbai, India  
 Mitochondria and Metabolism Networking Conference, IISER Pune, India

### **Contributed Talks (selected from abstract)**

2019 JCS Cell Dynamics: Organelle-Cytoskeleton Interactions Meeting, Lisbon, Portugal 2019

2017 EMBO Frontiers in Cytoskeleton Research, IISER Pune, India  
 EMBO Meiosis Meeting, Hvar, Croatia

2016 Mechanical Forces in Cell Biology 2016, Bangalore, India

2012 Annual Meeting of the American Society for Cell Biology, San Francisco, USA  
 27th Cytoskeletal Forum Meeting, Pecs, Hungary  
 Microtubules: Structure, Regulations and Functions Conference, Heidelberg, Germany  
 35th Annual Meeting of the German Society for Cell Biology, Dresden, Germany

2011 2nd IRB Student Symposium- Life in Dynamics, Barcelona, Spain

2009 International Workshop on Biodesign Automation, San Francisco, USA

## Poster Presentations

2018 Gordon Research Conference on Cytoskeletal Motors, Vermont USA  
2017 Actin and microtubule cytoskeleton: bridging scales from single molecules to tissues 2017, Roscoff, France  
2016 Microtubules: Structure, Regulations and Functions, Heidelberg, Germany  
2014 Microtubules: Structure, Regulations and Functions, Heidelberg, Germany  
2011 6th International Fission Yeast Meeting, Boston, USA

## TEACHING

### Courses

- **Cell Mechanics (2019 – present)**  
30 hours of teaching in a semester to a class of ~25 Undergraduate and Graduate students.
- **Biology and Physiology for Engineers (with Prof. Siddharth Jhunjhunwala, BSSE, 2018 – present)**  
7.5 hours of teaching in a semester to a class of ~25 Graduate students.

### Invited Instructor

- **Introduction to image analysis**

A hands-on introduction to image analysis on Fiji/ImageJ. Taught at:

- RCB Bioimaging Workshop, Regional Centre for Biotechnology, India, 2018
- International Workshop on Modern Biophysical Tools and Techniques, IIT Bombay, India, 2017
- QIP Course on Modern Biophysical Tools and Techniques, IIT Bombay, India, 2017
- Workshop of Biennial Meeting of the Indian Society of Developmental Biologists, IISER Pune, India, 2017

- **Cytoskeleton and Motor Proteins**

(As a part of the Bioengineering Workshop held at, Indian Institute of Science, 2018)

- **Advances in Cell Biology – Protein Trafficking**

(As a part of Indian Science Academies' Refresher Course for College Teachers)

## MENTORING

### PhD Students

- Joel Joseph Dec 2019 – present
- Harsh Kumar (jointly with Prof. Sandhya S. Viswesvariah, IISc) Aug 2019 – present
- Mitali Shah Aug 2018 – present
- Nireekshit Addanki Tirumala July 2015 – present

### Master's Students

- Leeba Ann Chacko (Junior Research Fellow) Dec 2017 – present
- Rishabh Singh (Project Assistant, now: MS Boston Univ., USA) July 2017 – June 2018
- Kritika Mehta (Junior Research Fellow, now: PhD UIUC, USA) July 2017 – July 2018
- Tirthankar Sengupta (Research Associate) Sept 2016 – Nov 2017
- Stephen Nuthalapati (Junior Research Fellow, now: PhD GLU Geisen, Germany) July 2016 – July 2017
- Ashwini Ravi (Project Assistant, now: PhD Bangalore Univ., India) July 2015 – July 2017
- Jerrin Mathew Thankachan (Junior Research Fellow, now: PhD IISc, India) July 2015 – June 2016

### Undergraduate Students

- Lauren Raasch (SN Bose Summer Research Fellow from U. Michigan, USA) Jun 2019 – Aug 2019
- Ananya Rajagopal (Research Intern) May 2019 – July 2019
- Anand Sankar (Project Assistant) Aug 2018 – Sept 2018
- Reshma Raj (Research Intern) Aug 2017 – Aug 2018
- Elsa Barron (SN Bose Summer Research Fellow from U. Notre Dame, USA) July 2018 – Aug 2018
- Aditya Jeevannavar (Research Intern) May 2018 – July 2018
- Keval Pandya (MBBS Research Intern) May 2018
- Manish Ayushman (Research Intern, now: PhD Stanford Univ., USA) May 2017 – July 2017
- Parth Sharma (MBBS Research Intern) May 2017
- Amoolya Girish (Research Intern, now: MS U. Florida, USA) Sept 2016 – Dec 2016
- Milind Singh (Research Intern, now: PhD Yale Univ., USA) May 2015 – July 2015

## **PROFESSIONAL SERVICE**

- Co-chair of the 'Emerging Topics' session of the 'Microtubules: From Atoms to Complex Systems' Virtual Meeting 2020
- Co-organizer of 'Signatures of Non-equilibrium Fluctuations in Life' Meeting 2020, ICTP, Trieste, Italy (independently raised EUR 3000 from EMBO) – *postponed due to COVID-19 pandemic*
- Co-organizer of Young Investigator Meeting 2020, Mahabalipuram, India (independently raised ~EUR 6250 from the Indian Institute of Science)
- Co-organizer of Microtubules. Motors, Tips and Tracks Meeting 2021, Bangalore, India
- Guest Editor of the Special Issue on Cytoskeletal Mechanics, Journal of the Indian Institute of Science, 2021
- Ad-hoc reviewer for Journal of Cell Science, Communications Biology, PLoS One, Scientific Reports, RSC Advances, Matters, ACS Applied Materials and Interfaces, ACS Biomaterials Science and Engineering, Journal of Biomaterials Science, Journal of the Indian Institute of Science
- Member of the Committee on Women's Equity and Inclusion at the Indian Institute of Science
- Co-founder of BiasWatchIndia, an initiative to document and combat gender-biased panels at Indian science conferences and meetings
- Contributions nationally and within the Institute: PhD thesis examiner (1 student), Comprehensive Exam/Thesis Advisory Committee Member (11 students)