

## Dr. SATISH SASIKUMAR

**Designation:** Assistant Professor

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**Academic Qualifications:** M.Sc. (Zoology), Ph.D. (Zoology, Developmental Genetics)

**Area of Specialization:** Cell and Developmental Biology, Genetics



### EDUCATION

**Doctor of Philosophy (Ph. D.)** in Zoology from Banaras Hindu University, Varanasi, India (Jan.1998 - Feb. 2006). **Thesis:** *Studies on role of Rab11 in Drosophila development.*

**Master of Science (M. Sc.)** in Zoology from University of Calcutta, Kolkata, India (Sept. 1995 - Oct. 1997). Specialization- Advanced Cytology and Genetics. 1<sup>st</sup> Class (69.6%)

**Bachelor of Science (B. Sc.)** in Zoology (Honours) from University of Calcutta, Kolkata, India (Sept. 1992 - Aug. 1995). Other subjects: Botany, Chemistry. II<sup>nd</sup> Class (59.0%)

### PROFESSIONAL EXPERIENCE –Teaching & Research

#### A) TEACHING

**Assistant Professor (Biotechnology), Dr. D. Y. Patil Biotechnology and Bioinformatics Institute,** Tathawade, Pune, India (1<sup>st</sup> August 2016-to date)

- Subjects taught: **Undergraduate:** Human Genetics, Developmental Biology, Disease Biology, Molecular Diagnostics, Cancer Biology, Biopharmaceuticals and Molecular Biology.

**Postgraduate:** Developmental Biology and Stem Cells, Cell and Molecular Biology, Genetics, Biopharmaceuticals, Clinical Research.

**Tutor with Eduwizards (www.eduwizards.com)** for online and home tutoring (March 2016-July 2016) Guiding students pursuing PUC (+2), Bachelor's and Master's degree programmes in Zoology/Animal Sciences.

**Guest Teaching Faculty, Department of Biotechnology, Sri Ramachandra University,** Chennai, India (Oct. 2009 – May 2011). Head of Department- Prof. T. S. Lokeswari Sivaswamy

- Taught specific cell and developmental biology courses of Master's program in Biotechnology.
- Conducted laboratory sessions to introduce a variety of *Drosophila* mutants and cytogenetic methods.

## B) RESEARCH

### i) Postdoctoral

**Visiting Researcher, The Saban Research Institute, Children's Hospital Los Angeles (CHLA),** Los Angeles, California, USA (Jun. 2012 – Mar. 2013). Advisers - Prof. David Warburton and Dr. Laura Perin

- Characterized the expression of Grainyhead-like 2 transcription factor in normal and fibrotic human lung, and mouse models of pulmonary fibrosis (resulting from drug-induced injury in lungs). Significant variations in the expression and distribution of Grainyhead-like 2 in fibrotic lung link it to pathogenesis of the disease.
- Examined the distribution of Grainyhead-like family of proteins in human amniotic fluid stem cells, which have been used to delay the progression of renal fibrosis in animal models.

**Senior Project Associate, Department of Biological Sciences and Bioengineering, Indian Institute of Technology,** Kanpur, India (Oct. 2007 – Apr. 2009). Adviser - Prof. Pradip Sinha

- Analyzed the distribution and role of atypical cadherins, Dachshous (Ds) and Fat (Ft) in *Drosophila* embryos. Ds-Ft protein complex drive cytoskeletal reorganization in the epidermal cells to facilitate dorsal closure, which involves spreading and fusion of epithelial tissues.

**Postdoctoral Researcher, Department of Zoology, Banaras Hindu University,** Varanasi, India (Feb. 2006 – Oct. 2007). Adviser - Prof. Jagat K. Roy

- Studied role of Rab11, a small GTP binding protein in *Drosophila* epithelial development. *Rab11* mutant embryos show defective epidermal patterning. A novel link was established between Rab11 and JNK signaling cascade.

### ii) Doctoral

**Guest Scientist, German Cancer Research Centre (DKFZ), Heidelberg, Germany** (Jun. - Sep. 2001 and Feb. - Jul. 2002). Host - Prof. Bernard M. Mechler

- Identified interacting proteins of Rab11 to understand its role in *Drosophila* development. Yeast two-hybrid assay revealed three proteins, namely Nuclear fallout (Nuf), Sec15 and Rip11. Further, the biochemical interactions of Rab11 and Nuf were established by GST pull down assay.

**PhD Graduate Student and CSIR Junior/Senior Research Fellow, Department of Zoology, Banaras Hindu University,** Varanasi, India (Jan. 1998 – Feb. 2006). Adviser - Prof. Jagat K. Roy

- Analyzed the expression of Rab11 at various developmental stages in *Drosophila*, which revealed that it is significantly expressed in epithelial cell types. It regulates the morphology of epithelial cells, namely amnioserosa and lateral epidermis during dorsal closure.

## ACADEMIC AND ADMINISTRATIVE EXPERIENCE

- **Assistant Professor** (Biotechnology, specialized areas-Genetics & Developmental Biology, current), Dr. D. Y. Patil Biotechnology and Bioinformatics Institute (DYPBBI), Dr. D. Y. Patil Vidyapeeth (DPU), Pune.
- **Paper Setter and Examiner** for subjects: Human Genetics, Disease Biology, Clinical Research, Developmental Biology, Developmental Biology & Stem Cells and Molecular Diagnostics **since November 2016 to date** in Dr. D. Y. Patil Vidyapeeth (DPU), Pune.
- **Co-drafted a revised syllabus in subjects viz:** Developmental Biology, Genetics, Molecular Diagnostics, Disease Biology and Personalized Medicine for programs namely, B. Tech in

Biotechnology, B. Tech in Medical Biotechnology and M. Tech (Integrated) in Biotechnology during **September-October 2017** at DYPBBI, DPU, Pune.

- **Member, Examination and Evaluation Committee (September 2016- to date)** at DYPBBI, DPU, Pune.
- **Member, Anti-Ragging Squad (September 2016- to date)** at DYPBBI, DPU, Pune.
- **Class Coordinator/Teacher-in-charge (Years 2020-2021) for Master in Biotechnology (Final year)**
- **Internal Guide/Mentor for Final Year Research Projects (years: 2017, 2018, 2019)** in B. Tech in Biotechnology, B. Tech in Medical Biotechnology and Master of Technology (M. Tech) (Integrated) program in Biotechnology, DYPBBI, DPU, Pune.
- **Co-organized Science Day with students of DYPBBI**, Pune and neighbouring schools in Tathawade, Pune for poster presentations/models on the theme “Science and Technology for a sustainable future” held at DYPBBI, DPU, Pune on 28<sup>th</sup> February 2018 and 28<sup>th</sup> February 2019.
- **Member of Organizing Committee and Participant** in a National Symposium held on 14-16<sup>th</sup> March 2019 at DYPBBI, DPU, Pune.
- **Member of Organizing Committee and Participant** in Industry-Academia Conclave held on 23-24<sup>th</sup> February 2018 at DYPBBI, DPU, Pune.
- **Member of Organizing Committee and Participant** in a National Symposium held on 16-17<sup>th</sup> March 2017 at DYPBBI, DPU, Pune.
- **Former Class Coordinator/Teacher-in-charge for B. Tech in Biotechnology, B. Tech in Medical Biotechnology and M. Tech (Integrated) in Biotechnology-Advanced Semesters, (January 2017- December 2018)** at DYPBBI, DPU, Pune.
- **Former Secretary, Curriculum Revision Committee (September 2016-July 2017)** at DYPBBI, DPU, Pune.
- **Former member of the following committees viz:** Research Development and Sustainance, Library Advisory, Student Support, Mentoring and Welfare, Biosafety and Healthy Practices, Internal Quality Assurance Cell (IQAC) (September 2016-July 2017) at DYPBBI, DPU, Pune.

## OVERVIEW OF RESEARCH

- My goals are to understand the genetic contribution in the pathogenesis of Idiopathic Pulmonary Fibrosis (IPF) in an Indian population. I also wish to explore the role of Grainyhead-like 2, a transcription factor in nuclear organization and IPF.

## RESEARCH COLLABORATIONS

- Project titled “**Genetic contribution in the pathogenesis of idiopathic pulmonary fibrosis in India**” with Dr. K. Sreenivasulu, Professor, School of Life Sciences, University of Hyderabad, Hyderabad, Telengana.

## RESEARCH PROJECTS

- Awarded an intramural grant for Rupees 320,000 by Dr. D. Y. Patil Vidyapeeth (DPU), Tathawade, Pune in the year 2018 to pursue a research project titled “**Molecular and genetic analysis of Grainyhead-like proteins in idiopathic pulmonary fibrosis and nuclear organization**”.

## PEER-REVIEWED PUBLICATIONS (published)

### A) Publication as First Author and joint Corresponding Author in indexed journals

- 1) **Satish Sasikumar\***, Jagat K. Roy (2009) Developmental expression of Rab11, a small GTP binding protein in *Drosophila* epithelia, *Genesis*, **47**, 32-39 (\* **joint corresponding author**). Online ISSN-1526-968X ISI-indexed journal (Thomson-Reuters), journal also indexed by Medline/PubMed, **Impact Factor-**

2.667, Citation- 16 (Reference-Google Scholar), h-index-2 (Reference-Google Scholar and Harzing's Publish or Perish).

## B) Publication as Co-author in indexed journals

- 1) Saaket Varma, Poornima Mahavadi, **Satish Sasikumar**, Leah Cushing, Tessa Hyland, Ann E Rosser, Daniela Riccardi, Jining Lu, Tanya V. Kalin, Vladimir V. Kalinichenko, Andreas Guenther, Maria I. Ramirez, Annie Pardo, Moises Selman and David Warburton (2014) Grainyhead-like 2 (GRHL2) distribution reveals novel pathophysiological differences between human idiopathic pulmonary fibrosis and mouse models of pulmonary fibrosis, *American Journal of Physiology Lung Cellular and Molecular Physiology*, **306 (5)**, L405-L419. Online ISSN- 1522-1504, ISI-indexed journal (Thomson-Reuters), journal also indexed by Medline/PubMed, **Impact factor- 4.092**, Citation- 16 (Reference-Google Scholar), h-index-2 (Reference-Google Scholar and Harzing's Publish or Perish). **Selected by *Global Medical Discovery Series* [ISSN 1929-8536] as a Key Scientific Article contributing to excellence in biomedical research.**

## C) Invited Review

- 1) Ashima Bhan, **Satish Sasikumar**, Arvind Goja, Rajendra T K (2017) Bioethical concerns of CRISPR: a genome editing technology, *Global Bioethics Enquiry*, **5(2)**, 68-72. Online ISSN 2207-7723, Print ISSN 2207-7715. **Global Bioethics Enquiry is a scholarly publication of the UNESCO Chair in Bioethics.**

## D) Invited Book Chapters

- 1) **Satish Sasikumar\***, Ashima Bhan and Rajendra TK (2018) Stem Cells for Nerve and Muscle Repair: Harnessing Developmental Dynamics in Therapeutics. In Pham P., El-Hashash A. (eds) *Stem Cells for Cancer and Genetic Disease Treatment. Stem Cells in Clinical Applications*. Springer, Cham, pp. 149–185. Citation 1. Print ISSN- 2365-4198, Online ISSN-2365-4201. (\* **joint corresponding author**).

## PRESENTATIONS IN CONFERENCES AND SYMPOSIUM

### A) INTERNATIONAL

- 1) **Satish Sasikumar** (2018) Epithelial Cell Activation and Idiopathic Pulmonary Fibrosis. Abstract Page No. 62, International Conference on Emerging Researches in Bioscience (ICERB-2018), Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh, India (**Invited Talk**).
- 2) Saaket Varma, Poornima Mahavadi, **Satish Sasikumar**, Leah Cushing, Tessa Hyland, Ann E Rosser, Daniela Riccardi, Jining Lu, Tanya V. Kalin, Vladimir V. Kalinichenko, Andreas Guenther, Maria I. Ramirez, Annie Pardo, Moises Selman and David Warburton (2013) Grhl2 distribution reveals novel patho-physiological differences between human IPF and mouse models of pulmonary fibrosis, Pulmonary Fibrosis Foundation (PFF) Summit, San Deigo, California, USA.
- 3) Saaket Varma, Poornima Mahavadi, Leah Cushing, Tessa Hyland, **Satish Sasikumar**, Jining Lu, Andreas Guenther, Annie Pardo, Moises Selman and David Warburton (2013) Grainyhead-like 2 (GRHL2) in human idiopathic pulmonary fibrosis versus mouse models of fibrosis, Poster #2020. Keystone Symposia on Lung Development, Cancer and Disease (B2), Taos, New Mexico, USA.
- 4) Amit Kumar, Priya Srivastava, **Satish Sasikumar** and Pradip Sinha (2010) "Collective cell migration during morphogenesis: role of atypical cadherins Dachous (Ds) and Fat (Ft) ", Poster P07, Cell Architects Symposium-Using Micropatterns for Quantitative Cell Analysis, EMBL Heidelberg, Germany.
- 5) Pradip Sinha, Priya Srivastava, **Satish Sasikumar** and Amit Kumar (2008) "Leading at the edge: Role of the Fat tumor suppressor in planar cell migration", Abstract No. 940A, 49<sup>th</sup> Annual *Drosophila* Research Conference, San Diego, California, USA.

- 6) Jagat K. Roy, **Satish Sasikumar**, Anand K. Tiwari and Debasmita Alone (2004) “Rab11 participates in epithelial morphogenesis and maintenance of ommatidial organization in *Drosophila*”, EMBO International Workshop, Cell Interactions in Development and Disease, Centre for Cellular and Molecular Biology, Hyderabad, India.
- 7) Jagat K. Roy, Debasmita Upadhyaya and **Satish Sasikumar** (2001) “Role of *rab11* gene in *Drosophila* development and differentiation”, Abstract No. 11-25, NCBS Symposium on Cell and Developmental Biology, National Centre for Biological Sciences, Bangalore, India.

## **B) NATIONAL**

- 1) **Satish Sasikumar**, Bernard M. Mechler and Jagat K. Roy (2002) “Identification of protein interactors of Rab11 in *Drosophila*”, Abstract No. P-24, XXVI<sup>th</sup> All India Cell Biology Conference and Symposium, Cancer Research Institute, ACTREC, Navi Mumbai, India.
- 2) **Satish Sasikumar** and Jagat K. Roy (2000) “Expression of *rab11* in *Drosophila melanogaster*”, Abstract No. P-1.1, XXIV<sup>th</sup> All India Cell Biology Conference, Jawaharlal Nehru University, New Delhi, India.

## **PARTICIPATION IN CONFERENCES AND SYMPOSIUM (without platform/poster presentation)**

### **A) INTERNATIONAL**

- 1) 1<sup>st</sup> Annual Stem Cell Symposium “The Stem Cell Niche in Development and Regeneration” held at Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at University of Southern California, Los Angeles on 8<sup>th</sup> June 2012.
- 2) 8<sup>th</sup> Annual Stem Cell Symposium on “Stem Cells and Cancer: Shared Paths, Different Destinations” held at Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research, Jonsson Comprehensive Cancer Center at University of California Los Angeles, Los Angeles on 10<sup>th</sup> February 2012.

### **B) NATIONAL**

- 1) National Symposium on “Recent Advances in Modern Biology and Biotechnology 2019” held at Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Dr. D. Y. Patil Vidyapeeth, Pune from 14<sup>th</sup>-16<sup>th</sup> March 2019.
- 2) Industry-Academia Conclave held at Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Dr. D. Y. Patil Vidyapeeth, Pune from 23-24<sup>th</sup> February 2018.
- 3) National Symposium on “Recent Advances in Modern Biology and Biotechnology 2017” held at Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Dr. D. Y. Patil Vidyapeeth, Pune from 16<sup>th</sup>-17<sup>th</sup> March 2017.
- 4) XXII All India Cell Biology Conference on “Advances in Cellular and Molecular Biology” held at Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram from 20<sup>th</sup>-22<sup>nd</sup> February 1999.

### **INVITED TALKS**

- 1) Delivered a research talk on “Epithelial Cell Activation and Idiopathic Pulmonary Fibrosis” in the theme “Biomedical and Pharmaceutical Research” on 29<sup>th</sup> October 2018 in the International Conference on “Emerging Researches in Bioscience” (ICERB-2018) held from October 28-30, 2018 at Department of Zoology, School of Life Sciences, Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur, Chhattisgarh, India.

- 2) Delivered a research talk on “Grainyhead-like 2 (GRHL2) in Idiopathic Pulmonary Fibrosis and nuclear organization” on 8<sup>th</sup> February 2017 at Centre for Genetic Disorders (CGD), Banaras Hindu University (BHU), Varanasi, India.

## TRAINING PROGRAMS

- 1) Completed a training programme on routine and advanced Molecular Diagnostic techniques from 6<sup>th</sup>-8<sup>th</sup> February 2017 (three full days) at Centre for Genetic Disorders, Banaras Hindu University (BHU), Varanasi, India.

## NATIONAL AND INTERNATIONAL MERIT FELLOWSHIPS/AWARDS

- 1) Awarded a Guest Scientist Fellowship by Deutsches Krebsforschungszentrum (DKFZ), Heidelberg, Germany in the years 2001 & 2002 to work with Prof. B. M. Mechler, DKFZ, Germany and carry out a part of my Ph.D. work.
- 2) Qualified the jointly conducted test by the Council of Scientific and Industrial Research (CSIR), New Delhi, India and University Grants Commission (UGC), New Delhi, India for Junior Research Fellowship (JRF) and Eligibility for Lectureship (NET), December 1998 and was awarded JRF to pursue research in any National Laboratory in India.
- 3) Qualified the jointly conducted test by the CSIR, New Delhi, India and UGC, New Delhi, India for Junior Research Fellowship (JRF) and Eligibility for Lectureship (NET), December, 1997 and declared eligible for Lectureship in any of the accredited University/Colleges in India.
- 4) Topped the Banaras Hindu University Research Entrance Test (BHU-RET) conducted in November 1997, and was awarded a Junior Research Fellowship by the University in the year 1998.

## MEMBERSHIP OF NATIONAL AND INTERNATIONAL BODIES

- 1) Life Member, Indian Society of Cell Biology (since 2017)
- 2) Student Member, Indian Society of Cell Biology (1998-2005)

## RESEARCH SKILLS

### Molecular Biology:

- Yeast two-hybrid assay (high-throughput library screening), in vitro translation (using radioactive label), extraction and purification of GST tagged fusion proteins, GST pull down assay, purification of recombinant proteins from yeast and bacteria, protein isolation from whole animals/tissues.
- Southern/Northern/Western analysis, Autoradiography, Polymerase Chain Reaction (PCR), reverse transcriptase-PCR.
- Bacterial culture work, isolation of DNA, gene sub-cloning, high-throughput screening of *Drosophila* genomic/cDNA libraries.

***Drosophila* (Fruit Fly):** Fly genetics, RNA: RNA in situ hybridization, whole mount immunostaining on tissues.

**Mouse:** Mice husbandry, timed pregnancy, euthanasia, surgery and tail biopsy for genotyping, tissue sectioning and immunohistochemistry, isolation and culture of amniotic fluid stem cells, immunocytochemistry.

**Microscopy, Image analysis and processing:** Light, Phase, Fluorescence and Multi-photon confocal microscopy, ImageJ and ZEN softwares, Adobe Photoshop.

## OTHER PROFESSIONAL ACTIVITIES

- 1) Served as internal guide/mentor to following students
  - Ms. Manjiri Salodkar and Mr. Vedant Kulkarni Final Year (2019-20) B. Tech Medical Biotechnology
  - Ms. Shivani Anil Navalakha, Final Year (2018-19) B. Tech Medical Biotechnology
  - Ms. Shejal Saxena, Final Year (2017-18) M.Tech (Integrated) Biotechnology
  - Ms. Yashika Karamchandani and Ms. Prashali Gupta, both Final Year (2017-18) B. Tech Biotechnology
  - Ms. Ashwini Patil, Final Year (2016-17) M.Tech (Integrated) Biotechnologyat DYPBBI, DPU, Pune in research projects.
- 2) Served as internal guide to Ms. Ashwini Patil, a student of Final Year (2016-17) M.Tech (Integrated) Biotechnology course at DYPBBI, DPU, Pune in a research project titled " Regulation of moving vesicular cargo at stationary cargo in motor mutant and transport regulators in neurons of *C. elegans*"
- 3) Supervision and technical guidance to junior researchers and visiting fellows both during doctoral and postdoctoral programmes.
- 4) Designed and drafted a successful grant proposal to Department of Biotechnology, India for INR 3.1 million with my postdoctoral adviser at IIT Kanpur.
- 5) Assisted the faculty at BHU, Varanasi in organizing local, national and international seminars/symposia.