

Univ.-Prof. Jay Gopalakrishnan PhD



Laboratory for Centrosome and Cytoskeleton Biology
Speaker Glio-Org, Glioma-PerMed, and DFG-FOR 4457
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Scientific career and research area

- Jay Gopalakrishnan is an Associate Professor (W2) and Head of the Laboratory for Centrosome and Cytoskeleton Biology (CCB) in the Medical Faculty of the Heinrich-Heine-University, Düsseldorf.
- Jay Gopalakrishnan hails from India (the Country of Tolerance). He studied pharmacology (at Madras Medical College, 1994-1998) and obtained a Master's in Chemical Engineering from the Indian Institute of Technology, Madras (IIT-Madras, 1999-2000). Jay Gopalakrishnan then received a prestigious DAAD fellowship and was grateful to obtain a Ph.D. from the Technical University of Berlin (2001-2004). His doctoral mentor is Prof. Lorenz Adrian.
- Jay Gopalakrishnan then went to Harvard Medical School and worked with Prof. Tomer Avidor-Reiss for his postdoctoral research (2006-2012). He is fortunate to have mentorships from Profs. Tom Rapaport, Tim Mitchison, and Danesh Moazad.
- Jay Gopalakrishnan returned to Germany and spent a brief post-doc with Tony Hyman before starting his research group. He won a Young Investigator award from the Human Frontiers Science Program (HFSP) and conducted independent research at the Centre for Molecular Medicine at the University of Cologne (2013-2018).
- Since 2018, Jay Gopalakrishnan has worked as a Professor in the Medical Faculty of the Heinrich-Heine-University, Düsseldorf.
- Jay Gopalakrishnan is the speaker for two large research programs internationally. The first is via an innovation prize to organize Glio-Org, and the second is Glioma-PerMed.
- Jay Gopalakrishnan with Dagmar Wachten (University of Bonn) also succeeded in getting a collaborative Research Unit on "Cilia Dynamics." and serves as a speaker for FOR5547, fully funded by the German Research Foundation (DFG).

His research area includes:

- Primary Cilia and centrosome biology
- 3D brain organoid research
- Disease modeling of rare neurodevelopmental disorders
- Personalized glioma invasion modeling and glioma medicine-Primary Cilia and centrosome biology

A brief statement of research interests

My research dissects how centrosomes and cilia function as molecular switches in determining the homeostatic control of neural stem cells. We have identified centrosomes and cilia biogenesis principles during the last decade, applying *Drosophila* genetics and biochemistry. Since 2016, we moved on to understand how these structures critically regulate neural stem cells' functions in human brain development, aging, and degeneration. To this end, we are one of the pioneers in self-assembling 3D human brain organoids. Using human organoids, my laboratory is now determined to decipher cilia's general rules as a molecular switch in brain development, cell physiology, neurodegeneration, and tumorigenesis, with a particular emphasis on translating basic research into the identification of molecular targets of human diseases.

Honours, Awards and Grants

Innovation prize by the BMBF BMBF VIP+ (Federal Ministry for Education and Research)
Speaker of Glioma-org, fully funded by the BMBF
Speaker of Glioma-PerMed, fully funded by the ERA-NET
Speaker of DFG FOR5547- "Primary cilia dynamics in tissue organization and function" fully
Advisory board, Canadian Stem Cell Network, Canada
Steering committee member, Stem Cell Network North Rhine Westphalia, Germany
One of the winners of attractive ideas by the University of Dusseldorf
Young Investigator award from the Human Frontiers Science Program (HFSP)
DAAD fellowship
Numerous DFG, BMBF, German Cancer Aid and Foundational grants.

Publications: <http://centrosome-cilia-lab.com/publications>

Ten most important publications

- Gabriel, E., *et al.* Gopalakrishnan J*. **Nature Protocols**. 2023 May 17. doi: 10.1038/s41596-023-00814-x.
- Gabriel, E., *et al.* Gopalakrishnan J*. **Cell Stem Cell**. 2021 Aug 12:S1934-5909(21)00295-2. doi: 10.1016/j.stem.2021.07.010.
- Goranci-Buzhala, G., *et al.* Gopalakrishnan J*. **Cell Reports**. 2021 Sep 7;36(10):109656. doi: 10.1016/j.celrep.2021.109656.
- Anand Ramani, *et al.* Gopalakrishnan J*. **EMBO Journal**. 2020 Oct 15;39(20):e106230. doi: 10.15252/embj.2020106230. **(Cover article)**
- Goranci-Buzhala G, *et al.* Gopalakrishnan J*. **Cell Rep**. 2020. Jun 9;31(10):107738. doi: 10.1016/j.celrep.2020.107738

- Arul Mariappan *et al.* Gopalakrishnan J*. **EMBO Journal** 2019. Dec 10. pii: e99876. doi: 10.15252/embj.201899876
- Gabriel E, *et al.* Gopalakrishnan J*. **Cell Stem Cell** 20, 2017. 1-10.
- Zheng X, *et al.* Gopalakrishnan J*, Li H*. **Nat Commun**, 7, 2016. 11874.
- Gabriel E, *et al.* Gopalakrishnan J*. **EMBO Journal**. 2016. Apr 15;35(8):803-19 (**Cover article**)
- Gopalakrishnan J, *et al.* Avidor-Reiss T*. **Nat Cell Biol** 14, 865-873.