



Popular Science Lecture

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Indian Women Scientists' Association

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Board of Research in Nuclear Sciences (BRNS) - DAE

IN ASSOCIATION WITH

Department of Biosciences

Union Christian College (Autonomous), Aluva, Kochi - 683102

LECTURE ON

“The Circuits of Sensation”

by

Dr. Shubha Tole



Date & Time

Tuesday, September 15, 2026 (11.45 am)

Venue:

T. B. Ninan Hall,
Union Christian College (Autonomous), Aluva

**Distinguished Professor, Department of Biological Sciences,
Tata Institute of Fundamental Research, Mumbai, India
*President, International Brain Research Organization***

All are cordially invited to attend

ABSTRACT

The Circuits of Sensation

In our brain, the cerebral cortex is the site of sensory perception and cognition. This structure is produced from stem cells in the embryo which sequentially produce neurons that occupy 6 cortical layers. These neurons then make connections that create the “circuit diagram” of brain function. Critical players in neuron-neuron communication are glial cells, which also arise as the final product of the same stem cells. Missteps in any of these processes cause a range of neurodevelopmental disorders.

I will present an overview of how this fascinating structure develops, and discuss our findings regarding two key regulators of cortical development. These are master regulators that control which type of neuron is produced, the shape of the neuronal “arbor” which determines the extent of its connectivity, and also the timing of the neuron-to-glia switch in the stem cells.

I will present this work in an accessible manner aimed at a wide non-specialist audience, and also bring out the approaches and techniques used to explore the early development of the brain.

Prof. Shubha Tole: *Neuroscientist | Brain Development Researcher | Mentor*

- **Education:** B.Sc. Life Sciences & Biochemistry, St. Xavier's College, Mumbai (1987); M.Sc. & Ph.D., Caltech, USA.
- **Career:** Postdoctoral Fellow, **University of Chicago**; joined **Tata Institute of Fundamental Research (TIFR), Mumbai**, as faculty in 1999; **Dean of Graduate Studies, TIFR (2019–2026)**.
- **Research:** Studies the **mechanisms governing brain development**, with emphasis on how the brain and neural circuits are formed.
- **Major Honours:**
 - **Infosys Prize – Life Sciences (2014)**
 - **Shanti Swarup Bhatnagar Prize (2010)**
 - **RAIN Award**, Society for Neuroscience, USA (2008)
 - **National Woman Bioscientist Award**, DBT (2008)
 - **Swarnajayanti Fellowship**, DST (2005)
 - **Wellcome Trust Senior International Fellowship (1999)**
 - **Bernice Grafstein Award for Outstanding Accomplishments in Mentorship**, Society for Neuroscience, USA (2022)
- **Professional Leadership:** Fellow of **all three Indian National Scientific Academies**; **President, International Brain Research Organization (IBRO)**; former Board Member, **ALBA Network**; former Chair, **Women in Science Panel, Indian Academy of Sciences**.
- **Mentorship & Outreach:** Conducts workshops on **Ethics in Science** and actively promotes science outreach in schools and colleges. She mentors young researchers and encourages students to communicate science to the public.
- **Science Communication:** Writes blogs on **mentorship, research careers, collaborations, gender equity and guidance for young scientists** through IndiaBioscience.
- **Distinction:** Recognized nationally and internationally for her contributions to **neuroscience, scientific leadership and mentorship**.

Blog: IndiaBioscience – Shubha Tole