



## DHARINI BRAIN MAP: SCIENCE & TECHNOLOGY

**NEWS:** IIT Madras researchers take a rare look inside the baby brain, one slice at a time

### WHAT'S IN THE NEWS?

The DHARINI brain atlas by IIT Madras is the first high-resolution 3D map of the fetal brain during the second trimester, created using indigenous robotic instrumentation. It aids in understanding brain development and disorders like autism and cerebral palsy.

### Introduction to DHARINI Brain Map

- Researchers at IIT Madras have developed a cutting-edge tool called DHARINI, which provides a high-resolution 3D map of five developing baby brains from the second trimester.
- This map is the most detailed representation of the fetal brain, offering valuable insights into its rapid growth during the critical second trimester.

### Significance of the DHARINI Brain Map

- DHARINI is the largest and most comprehensive brain atlas of its kind, capturing over 5,000 brain sections and more than 500 brain regions.
- It enables the detection of brain disorders like autism and provides crucial data on developmental disorders and conditions like cerebral palsy, hypoxia, and mental health disorders.
- This brain map could help explain significant differences in developmental timelines, such as when certain brain functions occur during pregnancy, offering new understanding in prenatal brain development.

### Research Collaboration and Expert Opinions

- The project was carried out in collaboration with Saveetha Medical College and Hospital, with key insights provided by Dr. J Kumutha, who highlighted the significance of this data for understanding brain disorders like autism.
- Experts like Kris Gopalakrishnan from Infosys believe that the insights gained from studying human brain development could lead to the creation of better AI tools and contribute to advancements in mental health research





## Technological and Methodological Approach

- To create the brain atlas, researchers used the brains of five still-borns from different stages of the second trimester (14, 17, 21, 22, and 24 weeks).
- The brains were frozen, thinly sliced (at 10-20 microns thickness), stained, and imaged microscopically to capture detailed cellular structures.
- The images were digitized and stitched together to create a 3D map, showcasing IIT Madras' innovative technology in brain mapping.

## Comparison with Other Brain Atlases

- The DHARINI brain atlas is the first of its kind to map the developing fetal brain. The only other publicly available brain atlas is from the US Allen Institute for Brain Science, which maps adult brains.
- Unlike the Allen Institute, which took five years to create its atlas, IIT Madras' research has been more rapid, processing nearly one brain per month.

## Future Plans

- IIT Madras researchers plan to expand the brain atlas by studying pediatric and older brains, further enriching the knowledge of brain development across different age groups.
- The institute has already collected nearly 230 brains of still-borns and neonates for ongoing and future research.

**Source:** <https://indianexpress.com/article/health-wellness/baby-brain-iit-madras-researchers-look-inside-9718090/lite/>