Stanford



Vaidehi Natu

Physical Sci Res Scientist, Psychology

Bio

BIO

Dr. Vaidehi Natu is a Senior Staff Scientist in the Department of Psychology. Her research program aims to study how the human brain matures in terms of its anatomy and function from infancy to adulthood as it acquires new cognitive skills and behaviors. She uses a multimodal approach by combining techniques, including behavioral experiments, neuroimaging, histology, and transcriptomic gene analysis. This combination of techniques provides a unified understanding of how the brain's anatomy, function, and behavior interact to achieve complex and uniquely human skills.

ACADEMIC APPOINTMENTS

- Physical Sci Res Scientist, Psychology
- Member, Maternal & Child Health Research Institute (MCHRI)

PROFESSIONAL EDUCATION

- Postdoctoral Fellow, Stanford University , Neuroscience
- Ph.D., University of Texas at Dallas , Cognition and Neuroscience
- B.E., University of Pune , Electrical Engineering

COMMUNITY AND INTERNATIONAL WORK

- International Dyslexia Association, Dallas Branch

Research & Scholarship

RESEARCH INTERESTS

- Brain and Learning Sciences
- Child Development
- Early Childhood
- Psychology
- Research Methods

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Vaidehi Natu is a developmental neuroscientist. Her research program aims to study how the human brain matures from infancy to adulthood, as it acquires new life skills and behaviors: What are the origins of the cellular and molecular mechanisms of brain development during infancy? How does the trajectory of neural mechanisms unfold during development, as school-aged children acquire complex skills such as reading or face recognition?

What are some of the parallels in brain development across primate species? What changes occur in the brain in developmental disorders such as autism, multiple sclerosis, and dyslexia?

She uses a multi-modal approach by combining various neuroimaging techniques including functional magnetic resonance imaging (fMRI), quantitative MRI (qMRI), and diffusion MRI (dMRI) as well as behavioral observations, histology, comparative methods across humans and macaques, and intracranial electroencephalography. Combining complementary techniques provides a unified understanding of how the brain's anatomy, function, and behavior co-develop to achieve complex human skills.

Publications

PUBLICATIONS

- **Correction: Hierarchical microstructural tissue growth of the gray and white matter of human visual cortex during the first year of life.** *Brain structure & function*
  Perez, K., Allen, A., Tyagi, C., Tung, S. S., Fascendini, B., Yan, X., Horenziak, J., Ortiz, D., Wu, H., Grill-Spector, K., Natu, V. S.
  2026; 231 (3)
- **Hierarchical microstructural tissue growth of the gray and white matter of human visual cortex during the first year of life.** *Brain structure & function*
  Perez, K., Allen, A., Tyagi, C., Tung, S. S., Fascendini, B., Yan, X., Horenziak, J., Ortiz, D., Wu, H., Grill-Spector, K., Natu, V. S.
  2026; 231 (2): 15
- **How do infant brains fold? Sulcal deepening is linked to development of sulcal span, thickness, curvature, and microstructure.** *Communications biology*
  Tung, S. S., Yan, X., Fascendini, B., Tyagi, C., Reyes, C. M., Ducre, K., Perez, K., Allen, A., Horenziak, J., Wu, H., Keil, B., Natu, V. S., Grill-Spector, et al
  2026
- **Hierarchical microstructural tissue growth of the gray and white matter of human visual cortex during the first year of life.** *bioRxiv : the preprint server for biology*
  Perez, K., Allen, A., Tyagi, C., Tung, S. S., Fascendini, B., Yan, X., Horenziak, J., Ortiz, D., Wu, H., Grill-Spector, K., Natu, V. S.
  2025
- **White matter connections of human ventral temporal cortex are organized by cytoarchitecture, eccentricity and category-selectivity from birth.** *Nature human behaviour*
  Kubota, E., Yan, X., Tung, S., Fascendini, B., Tyagi, C., Duhameau, S., Ortiz, D., Grotheer, M., Natu, V. S., Keil, B., Grill-Spector, K.
  2025
- **White matter connections of human ventral temporal cortex are organized by cytoarchitecture, eccentricity, and category-selectivity from birth.** *bioRxiv : the preprint server for biology*
  Kubota, E., Yan, X., Tung, S., Fascendini, B., Tyagi, C., Duhameau, S., Ortiz, D., Grotheer, M., Natu, V. S., Keil, B., Grill-Spector, K.
  2024
- **Longitudinal development of category representations in ventral temporal cortex predicts word and face recognition.** *Nature communications*
  Nordt, M., Gomez, J., Natu, V. S., Rezai, A. A., Finzi, D., Kular, H., Grill-Spector, K.
  2023; 14 (1): 8010
- **White matter connections of high-level visual areas predict cytoarchitecture better than category-selectivity in childhood, but not adulthood.** *Cerebral cortex (New York, N.Y. : 1991)*
  Kubota, E., Grotheer, M., Finzi, D., Natu, V. S., Gomez, J., Grill-Spector, K.
  2022
- **White matter myelination during early infancy is linked to spatial gradients and myelin content at birth.** *Nature communications*
  Grotheer, M., Rosenke, M., Wu, H., Kular, H., Querdasi, F. R., Natu, V. S., Yeatman, J. D., Grill-Spector, K.
  2022; 13 (1): 997
- **Infants' cortex undergoes microstructural growth coupled with myelination during development.** *Communications biology*

Natu, V. S., Rosenke, M., Wu, H., Querdasi, F. R., Kular, H., Lopez-Alvarez, N., Grotheer, M., Berman, S., Mezer, A. A., Grill-Spector, K.
2021; 4 (1): 1191

- **Cortical recycling in high-level visual cortex during childhood development.** *Nature human behaviour*
  Nordt, M., Gomez, J., Natu, V. S., Rezai, A. A., Finzi, D., Kular, H., Grill-Spector, K.
  2021
- **Sulcal Depth in the Medial Ventral Temporal Cortex Predicts the Location of a Place-Selective Region in Macaques, Children, and Adults.** *Cerebral cortex (New York, N.Y. : 1991)*
  Natu, V. S., Arcaro, M. J., Barnett, M. A., Gomez, J., Livingstone, M., Grill-Spector, K., Weiner, K. S.
  2020
- **Neural adaptation to faces reveals racial outgroup homogeneity effects in early perception.** *Proceedings of the National Academy of Sciences of the United States of America*
  Hughes, B. L., Camp, N. P., Gomez, J., Natu, V. S., Grill-Spector, K., Eberhardt, J. L.
  2019
- **Apparent thinning of human visual cortex during childhood is associated with myelination.** *Proceedings of the National Academy of Sciences of the United States of America*
  Natu, V. S., Gomez, J. n., Barnett, M. n., Jeska, B. n., Kirilina, E. n., Jaeger, C. n., Zhen, Z. n., Cox, S. n., Weiner, K. S., Weiskopf, N. n., Grill-Spector, K. n.
  2019
- **Development of population receptive fields in the lateral visual stream improves spatial coding amid stable structural-functional coupling.** *NeuroImage*
  Gomez, J., Drain, A., Jeska, B., Natu, V., Barnett, M., Grill-Spector, K.
  2018
- **The functional neuroanatomy of face perception: from brain measurements to deep neural networks**
  Grill-Spector, K., Weiner, K. S., Gomez, J., Stigliani, A., Natu, V. S.
  ROYAL SOC.2018
- **The functional neuroanatomy of face perception: from brain measurements to deep neural networks.** *Interface focus*
  Grill-Spector, K., Weiner, K. S., Gomez, J., Stigliani, A., Natu, V. S.
  2018; 8 (4): 20180013
- **On object selectivity and the anatomy of the human fusiform gyrus** *NEUROIMAGE*
  Weiner, K. S., Natu, V. S., Grill-Spector, K.
  2018; 173: 604–9
- **Development differentially sculpts receptive fields across early and high-level human visual cortex.** *Nature communications*
  Gomez, J., Natu, V., Jeska, B., Barnett, M., Grill-Spector, K.
  2018; 9 (1): 788
- **Learning to Read Increases the Informativeness of Distributed Ventral Temporal Responses.** *Cerebral cortex (New York, N.Y. : 1991)*
  Nordt, M. n., Gomez, J. n., Natu, V. n., Jeska, B. n., Barnett, M. n., Grill-Spector, K. n.
  2018
- **Development differentially sculpts receptive fields across early and high-level human visual cortex** *Nature Communications*
  Gomez, J., Natu, V., Jeska, B., Barnett, M., Grill-Spector, K.
  2018; 9: 788
- **Defining the most probable location of the parahippocampal place area using cortex-based alignment and cross-validation.** *NeuroImage*
  Weiner, K. S., Barnett, M. A., Witthoft, N., Golarai, G., Stigliani, A., Kay, K. N., Gomez, J., Natu, V. S., Amunts, K., Zilles, K., Grill-Spector, K.
  2017
- **Microstructural proliferation in human cortex is coupled with the development of face processing** *SCIENCE*
  Gomez, J., Barnett, M. A., Natu, V., Mezer, A., Palomero-Gallagher, N., Weiner, K. S., Amunts, K., Zilles, K., Grill-Spector, K.
  2017; 355 (6320): 68-?
- **Development of Neural Sensitivity to Face Identity Correlates with Perceptual Discriminability.** *journal of neuroscience*

Natu, V. S., Barnett, M. A., Hartley, J., Gomez, J., Stigliani, A., Grill-Spector, K.
2016; 36 (42): 10893-10907

- **Spatiotemporal changes in neural response patterns to faces varying in visual familiarity.** *NeuroImage*
  Natu, V. S., O'Toole, A. J.
  2015; 108: 151-159