



**Jay A. Gottfried**, Plenary Speaker

Associate Professor in Ken and Ruth Davee Department of Neurology, Northwestern University

Presentation Title: **All Roads Lead to Smell: What Odors Can Teach Us About Brain Function**

### **Biographical Notes:**

Jay A. Gottfried, MD, PhD, received his AB from Princeton University, and his MD and PhD degrees from New York University, where his thesis work focused on patch-clamp recordings in rat hippocampal slices. After an internship at Mt. Sinai Medical Center in New York, he completed a neurology residency at the University of Pennsylvania in Philadelphia.

In 2001 Dr. Gottfried received a three-year Physician-Postdoctoral Research Fellowship from the Howard Hughes Medical Institute to work at University College London, where he launched a new research direction in functional imaging of the human olfactory brain.

In 2004 he joined Northwestern University Feinberg School of Medicine as Assistant Professor of Neurology, and was promoted to Associate Professor with Tenure in 2010.

As a physician, Dr. Gottfried sees patients with memory loss, dementia, neurobehavioral syndromes, and central disorders of smell loss.

As a scientist, he uses a combination of sensory psychophysics, functional MRI, physiological recordings, multivariate pattern analysis, computational modeling, and more recently, intracranial EEG techniques, to understand how odor information is encoded and stored in the human brain, and how emotion, learning, and experience modulate this information at the perceptual and neural levels.

He has authored numerous journal articles, chapters, and reviews in leading journals, including *Science*, *Nature Neuroscience*, *Neuron*, and *Nature Reviews Neuroscience*, and is the editor of a recent book titled *Neurobiology of Sensation and Reward*, published by CRC Press.

Dr. Gottfried has won two awards from the Association for Chemoreception Sciences as well as the Derek Denny-Brown Neurological Scholar Award from the American Neurological Association. He is a regular member on the Somatosensory and Chemosensory Systems (SCS) study section at NIH, and a Reviewing Editor for the *Journal of Neuroscience*. His research has been continuously funded by the NIH since 2006.

Visit Dr. Gottfried's website to learn more:

<http://www.neurology.northwestern.edu/faculty/gottfried/index.html>

### **Honors, awards, and scientific service**

1990	Medical Scientist Training Program (MSTP) Scholarship, New York University School of Medicine and the National Institutes of Health
2001	Annual Neurology Resident Scholarship, American Academy of Neurology
2001	Award of Excellence in National In-Service Neurology Exam, University of Pennsylvania

- 2001 Howard Hughes Medical Institute Physician-Scientist Research Fellowship, University College London (mentor: Raymond J. Dolan), 2001-2004
- 2004 The Moskowitz Jacobs Award for Research in the Psychophysics of Human Taste and Olfaction, Association for Chemoreception Sciences (AChemS) 2004 Annual Meeting
- 2007 The Science of Fragrance Award, The Sense of Smell Institute and the Association for Chemoreception Sciences (AChemS)
- 2009 Faculty Member, Faculty of 1000 Biology – Neuroscience/Sensory Systems
- 2010 Scientific Review Associate, *European Journal of Neuroscience*
- 2010 Review Editor, *Frontiers in Integrative Neuroscience*
- 2010 Member, Somatosensory and Chemosensory Systems [SCS] Study Section, NIH, 2010-2014
- 2011 Derek Denny-Brown Young Neurological Scholar Award, American Neurological Association
- 2013 Reviewing Editor, *Journal of Neuroscience*

### **Selected peer-reviewed publications**

1. **Gottfried, J.A.**, O'Doherty, J., & Dolan, R.J. (2002) Appetitive and aversive olfactory learning in humans studied using event-related functional magnetic resonance imaging. *Journal of Neuroscience* **22**: 10829-10837. PMID: 12486176.
2. **Gottfried, J.A.**, O'Doherty, J., & Dolan, R.J. (2003) Encoding predictive reward value in human amygdala and orbitofrontal cortex. *Science* **301**: 1104-1107. PMID: 12934011.
3. **Gottfried, J.A.**, & Dolan, R.J. (2004) Human orbitofrontal cortex mediates extinction learning while accessing conditioned representations of value. *Nature Neuroscience* **7**: 1144-1152. PMID: 15361879.
4. **Gottfried, J.A.**, Winston, J.S., & Dolan, R.J. (2006) Dissociable codes of odor quality and odorant structure in human piriform cortex. *Neuron* **49**: 467-479. PMID: 16446149.
5. Li, W., Luxenberg, E., Parrish, T., & **Gottfried, J.A.** (2006) Learning to smell the roses: experience-dependent neural plasticity in human piriform and orbitofrontal cortices. *Neuron* **52**: 1097-1108. PMCID: PMC1779760.
6. Li, W., Howard, J., Parrish, T., & **Gottfried, J.A.** (2008) Aversive learning enhances perceptual and cortical discrimination of initially indiscriminable odor cues. *Science* **319**: 1842-1845. PMCID: PMC2756335.
7. Plailly, J., Howard, J.D., Gitelman, D.R., & **Gottfried, J.A.** (2008) Attention to odor modulates thalamocortical connectivity in the human brain. *Journal of Neuroscience* **28**: 5257-5267. PMCID: PMC2706104.
8. Howard, J.D., Plailly, J., Grueschow, M., Haynes, J.-D., & **Gottfried, J.A.** (2009). Odor quality coding and categorization in human posterior piriform cortex. *Nature Neuroscience* **12**: 932-938. PMCID: PMC2834563.
9. Li, W., Howard, J.D., & **Gottfried, J.A.** (2010). Disruption of odor quality coding in piriform cortex mediates olfactory deficits in Alzheimer's disease. *Brain* **133**: 2714-2726. PMCID: PMC2948816.
10. **Gottfried, J.A.** (2010). Central mechanisms of odour object perception. *Nature Reviews Neuroscience*, **11**: 628-641. PMCID: PMC3722866.

11. Zelano, C., Mohanty, A., & **Gottfried, J.A.** (2011). Olfactory predictive codes and stimulus templates in piriform cortex. *Neuron* **72**: 178-187. PMCID: PMC3190127.
12. **Gottfried, J.A.** (Editor). (2012). *Neurobiology of Sensation and Reward*. (Boca Raton, FL: CRC Press/Taylor & Francis Publishing; 31 contributors, 19 chapters), 438 pp.
13. Wu, K.N., Tan, B.K., Howard, J.D., Conley, D.B., & **Gottfried, J.A.** (2012). Olfactory input is critical for sustaining odor quality codes in human orbitofrontal cortex. *Nature Neuroscience* **15**: 1313-1319. PMCID: PMC3431433.
14. Bowman, N.E., Kording, K.P., & **Gottfried, J.A.** (2012). Temporal integration of olfactory perceptual evidence in human orbitofrontal cortex. *Neuron* **75**: 916-927. PMCID: PMC3441053.
15. Vilares, I., Howard, J.D., Fernandes, H.L., **Gottfried, J.A.**, & Kording, K.P. (2012). Differential representations of prior and likelihood uncertainty in the human brain. *Current Biology* **22**: 1641-1648. PMCID: PMC3461114.
16. Olofsson, J.K., Rogalski, E., Harrison, T., Mesulam, M.M., & **Gottfried, J.A.** (2013). A cortical pathway to olfactory naming: evidence from primary progressive aphasia. *Brain* **136**: 1245-1259. PMCID: PMC3613711.
17. Hauner, K.K., Howard, J.D., Zelano, C., & **Gottfried, J.A.** (2013). Stimulus-specific enhancement of fear extinction during slow-wave sleep. *Nature Neuroscience*, in press. Advance online publication: doi: 10.1038/nn.3527. PMID: 24056700. PMCID in process.