Daniel Toker

Curriculum Vitae

Department of Neurology
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RESEARCH INTERESTS

I develop integrated computational and experimental approaches to understand mechanisms of pathological unconsciousness, including epilepsy and coma, and identify therapeutic targets.

EDUCATION

- Ph.D. in Neuroscience, University of California, Berkeley, 2019
- B.A. in Philosophy, Certificate in Neuroscience, Princeton University, *Magna Cum Laude*, 2013

PROFESSIONAL APPOINTMENTS

- Assistant Project Scientist: Neural Circuit Development and Dynamics Lab, UCLA, 2026—Present
- Postdoctoral Scientist: Neural Circuit Development and Dynamics Lab, UCLA, 2022—2026 (Advisor: Ranmal Samarasinghe, MD, PhD; joint appointment)
- Postdoctoral Scientist: Higher Cognition, Language, & Consciousness Lab, UCLA, 2020—2026 (Advisor: Martin M. Monti, PhD; joint appointment)
- Graduate Researcher: D'Esposito Lab (Advisor: Mark D'Esposito), UC Berkeley, 2016—2019
- Clinical Research Associate: Halo Neuroscience, San Francisco, CA, 2014—2015
- Lab Manager: Cognitive Affective Neuroscience Lab, UC Berkeley, 2013—2014
- Research Assistant: Koch Laboratory, Caltech, 2013
- Research Assistant: Computational Memory Lab, Princeton University, 2010—2013

PUBLICATIONS

- **Toker, D.**, Zheng, Z.S., Thum, J.A., Guang, J., Annen, J., Miyamoto, H., Yamakawa, K., Vespa, P.M., Laureys, S., Schnakers, C., Bari, A.A., Hudson, A., Pouratian, N., & Monti, M.M. 2026. Adversarial AI reveals mechanisms and treatments for disorders of consciousness. *Nature Neuroscience.*
- **Toker, D.** & Monti, M. 2025. Different Diseases, Same Circuits: Lessons from Rare and Overlooked Causes of Disorders of Consciousness. *Brain Communications*.
- **Toker, D.**, McCrimmon, C.M., Cao, Q., Pandey, A., Guzman, A., Shriram, A., Hudson, A., Monti, M.M., & Samarasinghe, R.A. Human Brain Assembloids Model Anesthetic-Induced Neural Dynamics. In revision.
- McCrimmon, C.M.* and **Toker, D.***, Pahos, M., Lozano, K., Lin, J.J., Parent, J., Tidball, A., Zheng, J., Molnár, L., Mody, I., Novitch, B.G., & Samarasinghe, R.A. 2025. Modeling cortical versus hippocampal network dysfunction in a human brain assembloid model

of epilepsy and intellectual disability. *Cell Reports*. * co-first authors (author order decided by coin flip)

- **Toker, D.**, Chiang, J.N., Vespa, P.M., Schnakers, C. and Monti, M.M. 2025. The Dipeptidyl Peptidase-4 Inhibitor Saxagliptin as a Candidate Treatment for Disorders of Consciousness: A Deep Learning and Retrospective Clinical Analysis. *Neurocritical Care*.
- **Toker, D.**, Müller, E., Miyamoto, H., Riga, M.S., Lladó-Pelfort, L., Yamakawa, K., Artigas, F., Shine, J.M., Hudson, A., Pouratian, N. and Monti, M. 2024. Criticality supports cross-frequency cortical-thalamic information transfer during conscious states. *eLife*.
- Thum, J.A., Malekmohammadi, M., **Toker, D.**, Sparks, H., Alijanpourotaghsara, A., Choi, J.W., Hudson, A.E., Monti, M.M. and Pouratian, N. 2024. Globus pallidus externus drives increase in network-wide alpha power with propofol-induced loss-of-consciousness in humans. *Cerebral Cortex*.
- Frohlich, J., Crone, J.S., Mediano, P.A., **Toker, D.**, & Bor, D. 2023. Dissociations between neural activity and conscious state: a key to understanding consciousness. *Frontiers in Human Neuroscience*.
- Frohlich, J., Chiang, J.N., Mediano, P.A., Nespeca, M., Saravanapandian, V., **Toker, D.**, Dell'Italia, J., Hipp, J.F., Jeste, S.S., Chu, C.J. and Bird, L.M. 2022. Neural complexity is a common denominator of human consciousness across diverse regimes of cortical dynamics. *Communications Biology*.
- **Toker, D.**, Pappas, I., Lendner, J.D., Frohlich, J., Mateos, D.M., Muthukumaraswamy, S., Carhart-Harris, R., Paff, M., Vespa, P.M., Monti, M.M., Sommer, F.T., Knight, R.T., and D'Esposito, M. 2022. Consciousness is supported by near-critical slow cortical electrodynamics. *Proceedings of the National Academy of Sciences*.
- Frohlich, J., **Toker, D.**, & Monti, M.M. 2021. Consciousness among delta waves: a paradox? *Brain*.
- Luppi, A.I., Cain, J., Spindler, L.R., Górska, U.J., **Toker, D.**, Hudson, A.E., Brown, E.N., Diringer, M.N., Stevens, R.D., Massimini, M., Monti, M.M., Stamatakis, E.A., & Boly, M. 2021. Mechanisms Underlying Disorders of Consciousness: Bridging Gaps to Move Toward an Integrated Translational Science. *Neurocritical Care*.
- DiCesare, J.A., Malekmohammadi, M., Sparks, H., **Toker, D.**, Monti, M., Hudson, A., & Pouratian, N. 2020. Pallidocortical Connectivity Changes with Anesthetic Loss of Consciousness in Parkinson's Disease Patients. *Neurosurgery*.
- **Toker, D.**, Sommer, F., D'Esposito, M. 2020. A simple method for detecting chaos in nature. *Communications Biology*.
- Jarreau, P., Cancellare, I., Carmichael, B., Porter, L., **Toker, D.**, & Yammine, S. 2019. Using Selfies to Challenge Public Stereotypes of Scientists. *PLoS ONE*.
- **Toker, D.** and Sommer, F. 2019. Information Integration In Large Brain Networks. *PLoS Computational Biology*.
- Lositsky, O., Chen, J., **Toker, D.**, Honey, C.J., Poppenk, J., Hasson, U., & Norman, K. 2016. Neural Pattern Change During Encoding of a Narrative Predicts Retrospective Time Estimates. *eLife*.
- Bishop, S.J., Aguirre, G.K., Nunez-Elizalde, A.O., **Toker, D.** 2015. Seeing the world through non-rose colored glasses: anxiety and the amygdala response to blended expressions. *Frontiers in Human Neuroscience*.

GRANTS, AWARDS, & NOMINATIONS

- 2026: Cures Within Reach Clinical Trials to Validate AI-Driven Drug Repurposing
- 2026: UCLA Broad Stem Cell Research Center Transformative Technology Development (TTD) Award
- 2024: Nomination for the UCLA Chancellor's Award for Postdoctoral Research
- 2023: NIH Kirschstein-NRSA F32 Fellowship
- 2022: Excellence in Research Award, UCLA Life Sciences
- 2019: Outstanding Graduate Student Instructor Award
- 2016: National Science Foundation (NSF) Graduate Research Fellowship
- 2013: George A. Miller Prize in Cognitive Science
- 2013: John Martyn Warbeke 1903 Prize in Metaphysics & Epistemology
- 2013: Tomb Prize for a thesis on the philosophy of time
- 2012: Sandra & Jeremiah Lambert '55 Award for Undergraduate Neuroscience

INVITED TALKS

- **Toker, D.** Advancing Coma Research Without Animal Models: Human-Derived and Computational Approaches. *Johns Hopkins 12th Annual 3Rs Symposium*, 2025.
- **Toker, D.** Incretin-Based Therapies for Disorders of Consciousness: AI, Retrospective Observations, and Preclinical Data. *UC & Western Neurotrauma Symposium*, 2024.
- **Toker, D.** Criticality supports thalamocortical information processing during conscious states. *USC MoBI Seminar Series*, May 2023.
- **Toker, D.** Edge-of-Chaos Criticality Supports Neural Information Processing During Conscious States. *Tiny Blue Dot Foundation Annual Meeting*, Allen Brain Institute, October 2022.
- **Toker, D.** Putting Measures of Integrated Information to the Test. *Northern California Consciousness Conference*, March 2016.

CONFERENCE PRESENTATIONS

- **Toker, D.** Modeling Cortical Versus Hippocampal Network Dysfunction in a Human Brain Assembloid Model of Epilepsy and Intellectual Disability. *Cold Spring Harbor Laboratory Development & 3D Modeling of the Human Brain Conference*, 2024. (Selected talk)
- **Toker, D.**, McCrimmon, C., Pahos, M., Lozano, K., Molnár, L., Mody, I., Parent, J., Novitch, B.G., Samarasinghe, R.A. SCN8A Mutations and Circuit-Level Dysfunction in DEE-13 Hippocampal Organoids. *American Epilepsy Society Annual Meeting*, December 2023. (Poster)
- **Toker, D.**, Tobias, B., Lozano, K., Taitano-Johnson, C., Monti, M., Hudson, A., & Samarasinghe, R. Human cortical organoids recapitulate hallmarks of anesthesia. *International Anesthesia Research Society Annual Meeting*, April 2023. (Poster)

- **Toker, D.**, Sommer, F., & D'Esposito, M. A simple method for detecting chaos (or its absence) in the brain. *Society for Neuroscience Annual Meeting*, October 2019. (Poster)
- **Toker, D.** & Sommer, F. Integrated information in large brain networks. *Society for Neuroscience Annual Meeting*, November 2017. (Poster)

PATENTS

- Wingeier, B., Lin, R., & **Toker, D.** (2019). U.S. Patent No. 10,507,324. Washington, DC: U.S. Patent and Trademark Office.

TEACHING EXPERIENCE

- Graduate Student Instructor: **Circuits, Systems, & Behavioral Neuroscience**. University of California, Berkeley, 2018. Instructors: Hillel Adesnik, Yang Dan, and Kristin Scott. Received **UC Berkeley's Outstanding Graduate Student Instructor Award** based on student evaluations, faculty observations, and demonstrated teaching effectiveness.
- Graduate Student Instructor**: The Evolution of the Human Brain** University of California, Berkeley, 2016—2017. Instructor: Terrence Deacon.

ACADEMIC SERVICE

Departmental Service

- **Academic Chair**, UCLA Psychology Postdoctoral Committee (2023—2025): Organized annual networking and career development events for psychology postdocs across UCLA.

Peer Review & Editorial

- Guest Editor: *Frontiers in Human Neuroscience*
- Manuscript Reviewer for *Brain*, *Neurology*, *NeuroImage*, *PLoS Computational Biology*, *Journal of Cognitive Neuroscience*, *Communications Biology*, *Patterns*, *Neuroscience of Consciousness*, *Entropy*, *PLoS ONE*, *PLoS Mental Health*

Research Mentoring

- Mentored graduate and undergraduate students in computational modeling, stem cell culture, and brain organoid techniques (UCLA, 2022—Present)
- Mentored undergraduate students in computational neuroscience (UC Berkeley, 2016—2019)

OUTREACH & PUBLIC ENGAGEMENT

- Science communication via social media platforms with combined audience of 197,000+ followers, focusing on neuroscience and AI
- Writer, *Mind Field* documentary series (2017-2019). Daytime Emmy nomination for Outstanding Writing
- Blog: thebrainscientist.com

MEDIA COVERAGE

- Featured in *Big Think*: "Inside a neuroscientist's quest to cure coma" (April 2025)
- Featured in *Big Think*: "Inside the search for a universal signature of unconsciousness" (August 2025)
- Featured in *Popular Mechanics*: "We May Finally Have a 'Cure' for Coma" (August 2025)

PROFESSIONAL MEMBERSHIPS

- American Epilepsy Society
- International Anesthesia Research Society
- Society for Neuroscience

REFERENCES

- Martin M. Monti, PhD: monti@ucla.edu
- Ranmal Samarasinghe, MD, PhD: RSamarasinghe@mednet.ucla.edu
- Mark D'Esposito, MD: despo@berkeley.edu
- Friedrich T. Sommer, PhD: fsommer@berkeley.edu