



Edwin (Ted) Abel, PhD

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B.A., Chemistry, Swarthmore College, Advisors: Dr. Greg Florant and Dr. Peter Thompson
M.Phil., Biochemistry, University of Cambridge, Christ's College, Advisor: Dr. Tim Hunt
Ph.D., Biochemistry and Molecular Biology, Harvard University, Advisor: Dr. Tom Maniatis
Postdoctoral Fellow, Center for Neurobiology and Behavior, College of Physicians and Surgeons, Columbia University, Advisor: Dr. Eric R. Kandel

Co-authored over 235 scientific papers and edited two books
h-index of 86; publications have been cited over 27,500 times
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<https://scholar.google.com/citations?user=2XITxRcAAAAJ&hl=en>

Fast Facts

- Founding Director, Iowa Neuroscience Institute
- Chair and Departmental Executive Officer, Department of Neuroscience and Pharmacology, University of Iowa
- Roy J. Carver Chair in Neuroscience, Carver College of Medicine, University of Iowa
- Brush Family Professor of Biology and Director, Biological Basis of Behavior Program, University of Pennsylvania, 1998-2016
- Leadership
 - Member, National Advisory Mental Health Council (2022-present)
 - Member, BRAIN Initiative Multi-Council Working Group (2022-present)
 - Chair, Section on Neuroscience, American Association for the Advancement of Science (2017)
 - President, Molecular and Cellular Cognition Society (2017-2019)
 - Chair, NIMH Board of Scientific Counselors (2014-2018)
 - Editor-in-Chief, *Neurobiology of Learning and Memory* (2012-2022)
 - Brain and Behavior Research Foundation, Scientific Council (2015-present)
 - Associate Editor, *Behavioral Neuroscience* (2006-2014)
 - NIH: Learning and Memory Study Section (2006-2010)
 - Cure Autism Now, Board of Directors (2005-2007)
 - NSF Behavioral Neuroscience Advisory Panel (1998-2003)
- Principal Honors and Awards
 - Presidential Lecturer, University of Iowa (2021)
 - Scholar of the Year, University of Iowa (2021)
 - Elected Fellow, American Psychological Association (2020)
 - Elected Member, National Academy of Medicine (2019)
 - Elected Fellow, Association for Psychological Science (2018)
 - Elected Fellow, American Association for the Advancement of Science (2015)
 - Donald O. Hebb Lecturer, Dalhousie University, Nova Scotia, Canada (2015)
 - Presidential Symposium Lecturer, Association for Psychological Science (2013)
 - Elected Fellow, American College of Neuropsychopharmacology (2012)
 - Dean's Award for Mentorship of Undergraduate Research, University of Pennsylvania (2006)
 - Human Frontiers Science Program Research Grant (2005-2009)
 - David and Lucile Packard Foundation Fellowship for Science and Engineering (2000-2006)
 - John Merck Scholars Award (1998-2002)
 - Freedman Award, National Alliance for Research on Schizophrenia and Depression (1996-1998)
 - Damon Runyon-Walter Winchell Cancer Research Fund Postdoctoral Fellowship (1993-1996)
 - National Science Foundation Fellowship, Harvard University (1987-1990)
 - Marshall Scholarship, University of Cambridge (1985-1987)

Research Summary.

Edwin G. (Ted) Abel, Ph.D. is the founding director of the Iowa Neuroscience Institute, an interdisciplinary center at the University of Iowa focused on the causes, treatments, and prevention of diseases that affect the brain and nervous system. He also chairs the Department of Neuroscience and Pharmacology at Iowa. Abel is recognized as a pioneer in defining the molecular mechanisms of long-term memory storage and in identifying how these processes go awry in neurodevelopmental and psychiatric disorders. He uses molecular and genetic approaches to define how neural circuits mediate behavior, including identifying the molecular impact of sleep deprivation on neuronal function and revealing epigenetic mechanisms that mediate memory.

- Abel's research on protein kinase A was the first to functionally connect long-lasting forms of synaptic plasticity to memory in mammals.
- Abel's work examining transcriptional regulation and memory was among the first to define the epigenetic mechanisms mediating memory storage. This research defined the epigenetic mechanisms for enhancing cognition, laying the groundwork for therapeutic approaches to target cognitive deficits.
- In creative experiments examining the role of sleep in memory, Abel found that brief periods of sleep deprivation impaired memory consolidation. Using a combination of molecular, genetic, and viral approaches, he determined that sleep loss impacts cAMP signaling, protein synthesis and spine structure, making him the first to identify molecular approaches to prevent memory deficits caused by sleep loss.
- Recent work in Abel's lab on mouse models for the study of autism has defined for the first time a potential molecular mechanism underlying the male bias of this disorder.

Current Major Grants

- NIH RO1 MH 087463 (Epigenetic mechanisms of memory storage)
- NIH RO1 MH 117964 (Molecular, cellular and circuit effects of sleep deprivation on hippocampal function)
- NIH RO1 AG 062398 (Mechanistic studies on the impact of sleep deprivation on gene regulation)
- NIH P50 HD 103556 (University of Iowa Hawkeye Intellectual and Developmental Disabilities Research Center)

Important Publications

1. **Abel, T.**, Bhatt, R. and Maniatis, T. (1992). A *Drosophila* CREB/ATF transcriptional activator binds to both fat body- and liver-specific regulatory elements. *Genes & Development* 6: 466-480.
2. Nguyen, P. V., **Abel, T.** and Kandel, E. R. (1994). Requirement for a critical period of transcription for induction of a late phase of LTP. *Science* 265: 1104-1107.
3. **Abel, T.**, Nguyen, P. V., Barad, M., Deuel, T. A. S., Kandel, E. R., and Bourtchouladze, R. (1997). Genetic demonstration of a role for PKA in the late phase of LTP and in hippocampus-based long-term memory. *Cell* 88: 615-626.
4. **Abel, T.**, Martin, K. C., Bartsch, D. and Kandel, E. R. (1998). Memory suppressor genes: Inhibitory constraints on the storage of long-term memory. *Science* 279: 338-341.
5. Lattal, K. M. and **Abel, T.** (2004). Behavioral impairments caused by injections of the protein synthesis inhibitor anisomycin after contextual retrieval reverse with time. *PNAS* 101: 4667-4672.
6. Vecsey, C. G., Baille, G., Jaganath, D., Havekes, R., Daniels, A., Wimmer, M., Huang, T., Brown, K., Li, X.-Y., Descalzi, G., Kim, S. S., Chen, T., Shang, Y.-Z., Zhuo, M., Houslay, M. D. and **Abel, T.** (2009). Sleep deprivation impairs cAMP signaling in the hippocampus. *Nature* 461: 1122-1125.
7. Hawk, J. D., Bookout, A. L., Poplawski, S. G., Bridi, M., Rao, A. J., Sulewski, M. E., Kroener, B. T., Mangelsdorf, D. J. and **Abel, T.** (2012). Nr4a nuclear receptors support memory enhancement by histone deacetylase inhibitors. *J. Clin. Invest.* 122: 3593-3602.
8. Havekes, R., Park, A. J., Ferri, S. L., Tudor, J. C., Bruinenberg, V. M., Poplawski, S. G., Day, J. P., Aton, S. J., Radwanska K., Meerlo P., Houslay M.D., Baillie G.S. and **Abel, T.** (2016). Sleep deprivation causes memory deficits by negatively impacting neuronal connectivity in hippocampal area CA1. *eLife* 5: e13424.
9. Mews, P., Donahue, G., Drake, A. M., Luczak, V., **Abel, T.** and Berger, S. (2017). Acetyl-CoA synthetase regulates histone acetylation and hippocampal memory. *Nature* 546: 381-386.
10. Grissom, N. M., McKee, S. E., Schoch, H., Bowman, N., Havekes, R., George, R., O'Brien, W. T., Kumar, M., Pickup, S., Jangir, V. K., Mahrt, E., Siegel, S., Poptani, H., Portfors, C., Nickl-Jockschat, T., Reyes, T. M. and **Abel, T.** (2018). Male-specific deficits in natural reward learning in a mouse genetic model of autism. *Molecular Psychiatry* 23: 544-555.
11. Chatterjee S., Bahl E., Mukherjee U., Walsh E. N., Shetty M. S., Yan A. L., Vanrobaeys Y., Lederman J. D., Giese K. P., Michaelson J. J., and **Abel T.** (2022). Endoplasmic reticulum chaperone genes encode effectors of long-term memory. *Science Advances* 8: eabm6063. doi: 10.1126/sciadv.abm6063.

Videos and Audio Interviews

- University of Iowa Presidential Lecture, "It's Not a Dream, It's a Memory": <https://youtu.be/ouYWO0HgaO4>
- How Iowa is advancing our understanding of autism: <https://btn.com/2020/04/02/iowa-autism-research/>
- Iowa Neuroscience Institute: <https://uiowa.edu/stories/breaking-barriers-brain-research>
- NPR's Science Friday: "What your genes can tell you about your memory": <https://www.sciencefriday.com/person/ted-abel/>