

George A. Mashour, M.D., Ph.D., Recipient of the 2021 Excellence in Research Award

Kevin K. Tremper, Ph.D., M.D.

It is my great pleasure to congratulate Dr. George A. Mashour on receiving the 2021 Excellence in Research Award from the American Society of Anesthesiologists (Schaumburg, Illinois). Dr. Mashour is internationally renowned in the fields of anesthesiology, neuroscience, and translational science, and is highly deserving of this recognition.

After his undergraduate study of philosophy and classics, Dr. Mashour received his M.D. and Ph.D. in neuroscience from Georgetown University (Washington, D.C.) in 2001 and was a two-time Fulbright Scholar in the neurosciences (Max Delbrück Center for Molecular Medicine, Berlin, Germany, 1998–1999; University of Bonn, Bonn, Germany, 2002–2003). He completed his residency and chief residency in anesthesiology at the Massachusetts General Hospital/Harvard Medical School (Boston, Massachusetts) in 2006 and a fellowship in neurosurgical anesthesiology at the University of Michigan (Ann Arbor, Michigan) in 2007. He is currently the Robert B. Sweet Professor and Chair of the Department of Anesthesiology at the University of Michigan Medical School, with additional professorships in neurosurgery, pharmacology, neuroscience, and psychology.

Dr. Mashour's main scientific focus has been the study of consciousness and its interruption during general anesthesia and sleep. He has built a multidisciplinary research team that spans neuroscience, anesthesiology, physics, network science, engineering, psychology, and philosophy. In the field of anesthesiology, he has made a number of important contributions, including (1) being a key player in introducing the science of consciousness to the study of anesthetic mechanisms, (2) conducting the first application of graph theory/network science to the study of anesthetic state transitions in the brain, (3) clarifying the relationship of sleep and general anesthesia through studies of homeostasis and causal interventions in the hypothalamus, and (4) identifying a common neural correlate of anesthetic-induced unconsciousness across propofol, sevoflurane, and ketamine in humans and animals. Additionally, he has conducted major clinical studies of neurologic and psychiatric outcomes of surgery, including investigations of intraoperative awareness, perioperative stroke, and delirium. In the field of neuroscience, Dr. Mashour has been recognized internationally for (1) investigating neural correlates



of consciousness, (2) identifying the role of the prefrontal cortex in regulating the level of consciousness, (3) providing the first rigorous empirical evidence for a neuroscientific basis of the near-death experience, (4) characterizing the role of network dynamics in consciousness, and (5) proposing a theoretical framework to study the evolutionary neurobiology of consciousness.

Dr. Mashour has conducted neuroscience in computational brain models, mice, rats, monkeys, healthy human volunteers, and patients. His work has been funded by the National Institutes of Health (Bethesda, Maryland) as a principal investigator through multiple (and competitively renewed) R01 grants with concurrent UL1, U01, T32, and R13 award mechanisms. According to the Blue Ridge Institute for Medical Research (Horse Shoe, North Carolina), he is currently the No. 1 National Institutes of Health-funded anesthesiology faculty member in the United States. His neuroscientific studies of consciousness have also been funded by the James S. McDonnell Foundation (St. Louis, Missouri) through a multicenter collaborative that he led. Dr. Mashour has authored more than 200 publications, with notable original articles and invited commentaries appearing in *New England Journal*

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of *Medicine*, *Lancet*, *Science*, *Science Advances*, *Nature Human Behavior*, *Proceedings of the National Academy of Sciences of the United States of America*, *Current Biology*, and *eLife*; highly respected anesthesiology journals such as *ANESTHESIOLOGY*, *British Journal of Anaesthesia*, and *Anesthesia & Analgesia*; and highly respected neuroscientific journals such as *Journal of Neuroscience*, *Neuroimage*, and *Neuron*. He has also been the sole or lead editor of five textbooks on anesthesiology and the neurosciences, all published by Cambridge University Press and Oxford University Press. Dr. Mashour has been invited to give keynote and named lectures on consciousness and unconsciousness across the United States as well as in Europe, Asia, and Australia. As one notable example, Dr. Mashour was the 2018 Thomas Willis Lecturer in the Nuffield Department of Clinical Neuroscience at the University of Oxford (Oxford, United Kingdom). As another example of his international reputation, in 2015 Dr. Mashour was awarded an August Wilhelm Scheer Visiting Professorship by the Technische Universität München (Munich, Germany; funded fellowship for up to 1 yr) and was named an Honorary Fellow of the university's Institute for Advanced Study; he was one of only 14 faculty members in the world to receive the honor that year and the only representative from medical sciences. Throughout his career, he has also been an active mentor of graduate students, postdoctoral fellows, and junior faculty—he currently mentors Foundation for Anesthesia Education and Research (Schaumburg, Illinois) and National Institutes of Health K23 Mentored Patient-Oriented Research Career Development Award fellows and has led multiple trainees to independent National Institutes of Health funding. In 2011, he received the inaugural Excellence in Mentorship award at the University of Michigan, which spanned the entire campus, and in 2020 he was elected to the Academy of Research Mentors in Anesthesiology, which is led by the Foundation for Anesthesia Education and Research.

In addition to his individual scientific pursuits and mentorship, Dr. Mashour has been a research leader institutionally and nationally. He conceived of and founded two scientific centers at the University of Michigan: the Center for Consciousness Science (founded in 2014, which he directed for 5 yr) and the Center for Drug Repurposing (founded in 2019, for which he serves as executive sponsor). He was the sole director (2015–2020) and is currently the co-director of the Michigan Institute for Clinical & Health Research (Ann Arbor, Michigan), the National Institutes of Health–funded Clinical and Translational Science Awards institute serving the University of Michigan; he served as Associate Dean for Clinical and Translational Research from 2015 to 2019. Dr. Mashour received a \$58 million National Institutes of Health Clinical and Translational Science

Awards grant as the lead principal investigator in 2017 and is the co-principal investigator of a renewal application that is currently under consideration. He has served on the Clinical and Translational Science Awards steering committee of the National Institutes of Health and as a National Institutes of Health study section member. He served on the board of directors of the Association for Clinical and Translational Science (Washington, D.C.) and as editor-in-chief of its official journal. He has also served as an editor for *ANESTHESIOLOGY* and *Anesthesia & Analgesia*. Dr. Mashour is currently one of 12 trustees of the International Anesthesia Research Society (San Francisco, California), president-elect of the Association of University Anesthesiologists (San Francisco, California), and a past president of the Society for Neuroscience in Anesthesiology and Critical Care (Richmond, Virginia). He previously served on the board of the Foundation for Anesthesia Education and Research, chairing the Grants Management Committee.

In his leadership roles, including his current role as chair, he has been an active advocate for diversity. For example, Dr. Mashour conceived of and sponsored a groundbreaking multidisciplinary symposium on LGBTQ research and researchers at the University of Michigan that drew from fields as diverse as science, public health, architecture, history, and dance. He built upon this event by collaborating with the Institute for Research on Women and Gender, University of Michigan, facilitating a pilot grant program and scientific network initiative to promote large-scale grant opportunities in trans health. Dr. Mashour is currently leading a national initiative in diversity and anti-racism in academic anesthesiology.

Dr. Mashour has received numerous institutional and national awards as a scientific mentor, clinical educator, and researcher. In recognition of his many contributions, he received the Presidential Scholar Award from the American Society of Anesthesiologists in 2011 and was elected to the National Academy of Medicine (Washington, D.C.) in 2018.

I was extremely pleased when I was informed that George was being honored by our society with this prestigious award, for I feel there is no one more deserving of this recognition.

Competing Interests

The author declares no competing interests.

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