The Lewis H. Wright Memorial Lecture is sponsored annually by the Wood Library-Museum of Anesthesiology (WLM) and honors the lecture's namesake, who was a pioneer in American anesthesiology.

This year's distinguished guest is Emery N. Brown, M.D., Ph.D., Warren M. Zapol Professor of Anaesthesia, Harvard Medical School, Anesthetist, Massachusetts General Hospital (MGH), and Edward Hood Taplin Professor of Medical Engineering and Professor of Computational Neuroscience at Massachusetts Institute of Technology (MIT). At MIT, Dr. Brown is also the Director of the Harvard-MIT Health Sciences and Technology Program. Dr. Brown was born in Florida, graduated with a B.A. in Applied Mathematics at Harvard College, an A.M. in Statistics at Harvard University, an M.D. in Medicine at Harvard Medical School and a Ph.D. in Statistics at Harvard University. Dr. Brown completed an internship in internal medicine at the Brigham and Women’s Hospital in 1988 and a residency in anesthesiology at the MGH in 1992. He joined the faculty at Harvard Medical School in 1992 and MIT in 2005; Dr. Brown is the only person to hold simultaneous endowed chairs at Harvard Medical School and MIT.

Dr. Brown's facility with statistics was apparent very early in his career. In 1992, he received a Robert Wood Johnson Minority Medical
Faculty Award and described “The Development of Statistical Methods for the Analysis of Diurnal Cortisol Patterns.” In 1996, Dr. Brown received grants to study the “Statistical Analysis of Human Circadian Rhythms,” and in 2000 he described the “Statistical Analysis of Hippocampal Information.”

Dr. Brown then became intrigued by the $64 million question we ask ourselves every day: “How does general anesthesia work?” During our training, we all learned the Meyer-Overton Hypothesis or Lipid Solubility-Anaesthetic Correlation and the Membrane Protein Hypothesis of general anesthesia. For Dr. Brown, the key to exploring the human body and the mechanism of general anesthesia was of course, statistics. He saw its value in interpreting human physiology and its elegance in refining models of consciousness and unconsciousness. His experimental research has focused on how anesthetics act in the brain to create the state of general anesthesia. In his research, Dr. Brown has developed signal processing algorithms to help understand how the brain represents and transmits information. Dr. Brown’s research group grew from a few postdoctoral students to an interdisciplinary team of anesthesiologists, neuroscientists, a statistician, a neurosurgeon, bioengineers and a mathematician at MGH, MIT and Boston University. This team has developed the first detailed neurophysiological descriptions of how anesthetics act at specific receptors in specific circuits to produce the states of altered arousal that comprise general anesthesia.

In 2007, Dr. Brown was the first anesthesiologist to receive an NIH Director’s Pioneer Award to promote research focusing on the mechanism of general anesthesia. In this effort, Dr. Brown and his colleagues identified and quantified the neural circuits and receptors where general anesthetic drugs act. He showed that anesthetics create altered states of arousal by generating oscillations or rhythms in brain circuits that, in turn, disrupt the normal transmission of signals among different brain regions. In 2013-14, Dr. Brown served on President Obama’s BRAIN Initiative Working Group; and in 2015, Dr. Brown received the ASA Excellence in Research Award. For the past two years, Dr. Brown and his team have conducted Phase II Clinical Trials, seeking to understand how patients awaken from general anesthesia. Using methylphenidate (Ritalin)™, which acts at the brain’s dopaminergic receptors, they have discovered that the state of general anesthesia, as we know it, can be reversed. Dr. Brown is one of only 19 people – and the only anesthesiologist – to have been elected to the National Academy of Medicine (2007), the National Academy of Sciences (2014) and the National Academy of Engineering (2015).

In the 2017 Lewis H. Wright Memorial Lecture, titled “A History of Neuroscience Research in Anesthesiology,” Dr. Brown will highlight the contributions of neuroscience in the field of anesthesia. The objectives of his lecture are to:

- Understand the history of how neuroscience has been used to study anesthesiology and how anesthesia has been used in neuroscience studies.
- Understand why to date anesthesiology is viewed as a sub-discipline of applied pharmacology and not as a clinical neuroscience subspecialty like neurology, neurosurgery, psychiatry, sleep, medicine and psychology.
- Understand what the role of neuroscience in modern anesthesiology research is and what is the impact this research is having on translating neuroscience ideas into anesthesiology practice.

Dr. Brown will present the lecture in four parts. In part 1, he will discuss ways in which anesthetic drugs have been used as probes to understand altered states of arousal such as sleep, coma and hallucinations. To give some meaning to this approach, it is critical to remember that many classical experiments in neuroscience were conducted while patients were under general anesthesia. In part 2, Dr. Brown will review examples of anesthetic confounds in neuroscience experiments and discuss implications for both neuroscience and anesthesiology. In part 3, he will discuss examples of serendipity – when the use of anesthetic drugs has provided an unexpected new insight into either a pathological brain state or into how to design a new therapy for a neuropsychiatric disorder. In part 4, Dr. Brown will discuss the importance of formal integration of anesthesiology into clinical neuroscience. It is hoped that that this integration will allow neuroscience to design more principled approaches to delivering anesthesia care and anesthesiology to contribute new insights for the other fields of clinical neuroscience, and finally, for anesthesiology to contribute fundamental knowledge about the workings of the brain.

On behalf of the WLM, we thank Dr. Brown for his creativity, his rigorous application of statistics to the clinical neuroscience of anesthesiology and his commitment to elucidating the mechanism of general anesthesia. With this year’s Lewis H. Wright Memorial Lecture, the audience will be asked to consider the history of anesthesia from another vantage point. On Friday, October 16, 1846, the first public demonstration of anesthesia occurred in the Bulfinch Building of Massachusetts General Hospital. It is fitting that 171 years later, in Boston, Massachusetts, Dr. Emery N. Brown will share his thoughts and interpretations on the truly magnificent gift of anesthesia.