IBBME DISTINGUISHED LECTURE

THURS. NOV. 14
GALBRAITH 202

EMERY BROWN

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The Dynamics of the Unconscious Brain Under General Anesthesia

General anesthesia is a drug-induced, reversible condition comprised of five behavioral states: unconsciousness, amnesia (loss of memory), analgesia (loss of pain sensation), akinesia (immobility), and hemodynamic stability with control of the stress response. The mechanisms by which anesthetic drugs induce the state of general anesthesia are considered one of the biggest mysteries of modern medicine. We study three problems to decipher this mystery. First, we present findings from our human studies of general anesthesia using combined fMRI/EEG recordings, high-density EEG recordings and intracranial recordings which have allowed us to give a detailed characterization of the neurophysiology of loss and recovery of consciousness due to propofol. Second, we present a neuro-metabolic model of burst suppression, the profound state of brain inactivation seen in deep states of general anesthesia. We show that our characterization of burst suppression can be used to design a closed-loop anesthesia delivery system for control of a medically-induced coma. Finally, we demonstrate that the state of general anesthesia can be rapidly reversed by activating specific brain circuits. Our results show that it is now possible to have a detailed neurophysiological understanding of the brain under general anesthesia, and that this understanding, can be used to control anesthetic states. Hence, general anesthesia is not a mystery.

THURSDAY
NOVEMBER 14
12-1:30 PM
GALBRAITH 202
Pizza lunch

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