

Max B. Kelz, MD PhD, Candidate Statement for Director at Large

As a practicing clinical neuroanesthesiologist and basic scientist, Dr. Kelz has conducted experiments in fruit flies, mice, and humans, gaining mechanistic insights across the phylogenetic tree. Clinically, Dr. Kelz cares for patients at the Hospital of the University of Pennsylvania who require spine or brain surgery. The Kelz laboratory seeks to understand the molecular and neuronal mechanisms culminating in entry into as well as exit from the anesthetized state. Dr. Kelz was amongst the first to speculate that the forward process through which patients enter states of general anesthesia is not identical to the reverse process through which they exit. Such anesthetic hysteresis carries implications for all state transitions including abrupt and covert—awareness under anesthesia, and sluggish or delayed emergence. For more than a decade, Dr. Kelz has attempted to identify endogenous neural systems that regulate sleep and wakefulness and upon which general anesthetics may exert their hypnotic effects. He has hypothesized that anesthetic-induced hypnosis arises in part via specific recruitment of sleep promoting networks while emergence can be facilitated via interactions with wake-promoting systems. General anesthesia and natural sleep are distinct states with similar traits. By probing the similarities and exploiting the differences between sleep and anesthesia, he strives to enhance the mechanistic understanding of natural and drug-induced modulation of arousal.

Dr. Kelz has presented his research in SNACC symposia and has been an active member of SNACC for the past six years. He has been continuously funded by the NIH for more than a decade. He is actively involved in teaching and has directly mentored trainees with varying levels of experience ranging from undergraduates (15), to medical students (11), Penn graduate students (5) and MD PhD students (5), residents (7), postdoctoral fellows (12) as well as junior faculty on K08 grants (2). Dr. Kelz is currently the David E. Longnecker Associate professor of Anesthesiology and Critical Care and is the Director for Research Education in the Department of Anesthesiology at the University of Pennsylvania.