The Role of Neuromodulation in Reactive Balance

Hillary Fruge

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The Utah State Psychology Department and Dr. Christopher Warren present The Role of Neuromodulation in Reactive Balance.

When balance is perturbed, generating a rapid balance reaction is critical to avoid a fall. During reactive balance, the central nervous system (CNS) is able to briefly speed up neural processing in motor pathways far beyond what is typical for normal, voluntary actions. The source of this boost to reactive balance is unknown. One candidate mechanism is phasic norepinephrine (NE) release. NE is a neuromodulator that makes neurons more responsive to simple inputs. Phasic NE release occurs in reaction to a wide range of events including unexpected or startling events. Phasic NE release includes targets in the vestibular system, the motor cortex, and the spinal cord. In my talk I will review evidence for the effects of NE in the central nervous system and the antecedent events that provoke phasic NE release. This will all lead up to my proposal that phasic NE release is critical for reactive balance, and I will describe my current research line for investigating this possibility.

Dr. Christopher Warren is an assistant professor at Utah State University in the Neuroscience PhD Program and Brain and Cognition PhD Specialization. He researches how the brain optimizes cognitive performance under varying circumstances. Specifically, he studies how neuromodulator systems mediate the impact of factors including arousal, danger, and motivation learning, attention, and decision making.

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