

## Abstract

Depression in adolescence is a growing public health concern, with symptoms beginning during the adolescent transition (9-to-14 years)<sup>1</sup> and conferring heightened risk for long-term deleterious psychological and cognitive outcomes.<sup>20-21</sup> Depression is associated with specific deficits in hippocampal-dependent memory (e.g., declarative memory).<sup>9-11</sup> Although the brain mechanisms underlying depression-related memory deficits are not understood, one potential risk factor may be poor sleep (e.g., short sleep duration, variable timing, or altered sleeping brain rhythms) given the causal role of sleep in supporting new hippocampal-dependent memory formation (sleep dependent memory [Hc-SDM]).<sup>12</sup> The adolescent transition is a particularly vulnerable time that involves sleep pattern and underlying sleeping brain rhythm maturation.<sup>2,3,13-15</sup> Although a few nights of insufficient sleep does not consistently affect Hc-SDM performance in adolescents<sup>18,50-53</sup>; typical insufficient weekly sleep is associated with reduced hippocampal volume.<sup>19</sup> **At present, the independent trajectories between poor sleep, depression, and Hc-SDM across the adolescent transition and the longitudinal associations between these factors are poorly understood.** To address this question, 46 youths (9-to-14 years) will be assessed using a repeated measurement-burst design over a year using a personalized, mobile health (mHealth) platform. At three evaluations, for 7 consecutive days, participants will complete daily sleep diaries, ecological momentary assessments, and Hc-SDM tasks and simultaneously wear remote sleep tracking head bands to assess maturing brain rhythms. We hypothesize that poor sleep and depression symptoms across the adolescent transition will predict long-term Hc-SDM performance trajectory deficits. Further, we hypothesize that changes in sleeping brain rhythms will to next day and future depression symptoms and cognitive task performance. The Conte Center Seed Funding Opportunity will support essential data collection to test the interactions of early life brain maturation, memory, and mental health and will directly lead to a NICHD R01 application to apply sleep-based interventions to support cognitive trajectories in vulnerable, depressed youth.