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강연 제목: 지속적 인지증강의 신경생리학적 기제와 두뇌건강관리의 미래
How does the brain learn better?: the neurobiology of learning to learn and the future of brain health care

Abstract:
Learning and memory are fundamental cognitive processes that allow animals to persistently and stably store information and flexibly adapt to dynamic environments. My research has focused on how persistent changes to circuit functions allow our brain to acquire long-lasting memory while accomplishing sustained cognitive enhancement in new learning. I studied how cognitive control training induces general cognitive enhancement by altering hippocampal neural circuit function beyond forming specific and explicit memories. I showed that cognitive control facilitated learning new tasks and rapidly changed medial entorhinal cortex (MEC)-to-dentate gyrus (DG) synaptic circuit function, resulting in an excitatory-inhibitory sub-circuit change that persists for months. Specifically, cognitive control training increases inhibition that attenuates the DG response to MEC input and, through disinhibition, potentiates the response to strong inputs, pointing to overall signal-to-noise enhancement. Next. I studied whether genetically increasing neurogenesis recruits inhibitory interneuron plasticity in the hippocampus to improve social recognition memory. I found that enhancing neurogenesis promoted social recognition, augmented PV inhibitory contacts in CA2/3 and enhanced functional inhibitory synaptic inputs onto CA2/3. Chemogenetic manipulation of inhibiotory interneuron was sufficient to decrease social interference. These neurobiological findings suggest that sustained circuit function changes store item-event associations and optimize information processing for improving cognition.

Brief Biosketch
2004 년 서울대학교 사회과학대학 심리학과 학사
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