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강연제목: 뇌내 신경전달물질의 기저농도 변화 측정을 위한 전기화학측정 기술 개발

Abstract:

Dopamine (DA) and serotonin (5-HT) are key neurotransmitters regulating various brain activities, such as behavior, emotions, and motivation through diverse neural circuits. Various studies have aimed to measure the changes in DA and 5-HT concentrations in the brain, by traditional methods like microdialysis and fast scan cyclic voltammetry (FSCV). However, these tools have limitations in analyzing neurotransmitter concentrations, including low temporal resolution and difficulty distinguishing between DA and 5-HT. Our group previously developed Multi-Cyclic Square Wave Voltammetry (MCSWV) to measure basal neurotransmitter concentrations with high spatial and temporal resolution by distinguishing them through their oxidation-reduction patterns, which has enabled its application in various neuroscience studies. However, there are still limitations in using this electrochemical method to measure neurotransmitter concentrations. The first limitation is the challenge of long-term measurements, as by-products of electrochemical reactions and immune responses make sustained measurements difficult. The second issue is that the oxidation signals of DA and 5-HT are still similar, making it challenging to differentiate the concentration of each neurotransmitter. Therefore, this study aims to address these challenges and present the process and results of overcoming them.

Brief Biosketch

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