

Amperometric biosensor for selective determination of dopamine based on tyrosinase/carbon nanoparticle/polypyrrole composite electrode

민경선, 유영제*
서울대학교
(yjyoo@snu.ac.kr*)

Dopamine is one of important neurotransmitters affects the brain processes. Low dopamine level in the brain tissue is associated with a variety of disease state and tools for measuring dopamine in tissue might help to diagnose disease such as Parkinson's. Electrochemical method can be used as direct measurement for the dopamine and have several advantages such as small dimension, easy operation, fast response, and high accuracy. However, major problem of electrochemical detection of the dopamine in real tissue is the co-existence of many interfering compounds. Among the interfering compounds, ascorbic acid is important because both the ascorbic acid and the dopamine can be oxidized at a near potential and this results in overlap of voltametric response. In this study, amperometric biosensor was developed for selective determination of the dopamine in the presence of the ascorbic acid. The biosensor was based on 3-dimensional tyrosinase/carbon nanoparticles/polypyrrole composite electrode and showed high sensitivity (467mA/Mcm^2) and low detection limit ($5\mu\text{M}$).