

### Electroenzymatic Synthesis of L-DOPA

민경선, 유영제\*  
서울대학교  
(yjyoo@snu.ac.kr\*)

L-DOPA has been widely used drug for Parkinson disease, neurological disorder which afflicts one out of every 1700 individuals and is caused by deficiency of neurotransmitter dopamine. L-DOPA is a precursor of dopamine and can pass across the blood brain barrier. About 250 tons of L-DOPA is now supplied per year and most of the current supply is produced by chemical method. Because of the high production cost and its high commercial value, the alternative production of L-DOPA has been investigated; microbial or enzymatic production.

In this study, L-DOPA was electroenzymatically synthesized using tyrosinase immobilized 3-dimensional composite electrode. L-DOPA was synthesized by cresolase activity of tyrosinase and the serial conversion of L-DOPA to DOPAquinone by catecholase activity of tyrosinase was prevented by electrical reduction. Compared to previous approaches for L-DOPA synthesis, electroenzymatic system showed high conversion rate and productivity during short reaction time, 95.9% and 1576 mg/Lh, respectively. This highly improved conversion rate can be explained by kinetic study.