E111

Developmental Regulation of Proteolytic Activities of Proteasome in Chick Embryonic Myoblasts in Culture

Pil Joong Chung[1*], Hye Sun Kim[1], and Chin Ha Chung[2]
Department of Biological Science, Ajou University[1],
Department of Molecular Biology, Seoul National University[2]

The peptide hydrolyzing activities of proteasome were found to change in their levels during the differentiation of chick embryonic myoblasts in culture. The peptide-cleaving activity against Suc-Leu-Leu-Val-Tyr-7-amido-4-methycoumarin increases with the time of culture and reaches a maximal level by the initiation of cell fusion and remaines at a higher level during the culture. On the other hand, the hydrolyzing activity of N-benzyloxycarbonyl-Ala-Arg-Arg-4-methoxy-β-naphthylamide slightly changes with the time of cell culture. The permeable inhibitors of proteasome, N-carbobenzoxy-leu-Leu-norvalinal and N-benzyloxycarbonyl-Ile-Glu(O-t-butyl)-Ala-leucinal, were found to block membrane fusion of chick embryonic myoblasts in culture with dose-dependency. Furthermore, they cause accumulation of ubiquitinylated proteins in cell extracts. These results suggest that the hydrolyzing activities of proteasome are developmentally regulated and proteasome may be a crucial protein for the growth and differentiation of myoblasts.

E112

Bat Liver-Tissue Based Biosensor for the Determination of Cytosine and Hydrogen Peroxide

Chang-Han Kim, Hyo-Shik Kwon, Seok-Ho Jung and Young-Ki Kim

Department of Science Education, College of Education, Chungbuk National University, Cheongju 361-763, Korea

The bioelectrode for cytosine has been constructed by immobilizing bat-liver tissue on an ammonia gas sensor. The bat-liver tissue containing cytosine deaminase convert one molecule of cytosine into one molecule of ammonia. The bat-liver tissue electrode showed linear response to cytosine concentration in the 1×10^{-4}M~3.2×10^{-2}M with a slope of 51 mV/decade in 0.10M phosphate buffer solution at pH 7.4. This electrode were investigated for the effects of pH, temperature, interferences, amino acid and lifetime.

An amperometric sensor for hydrogen peroxide has been made by immobilizing bat-liver tissues in carbon paste. A very short response time (9~12 seconds) and a relatively large usable pH range (5.4~8.2) were obtained. A detection limit of the electrode was 2×10^{-6}M hydrogen peroxide. The bat-liver tissue electrode offered high biocatalytic stability and activity and extremely low cost. The electrode had a useful lifetime of 15 days.