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Potentiometric biosensor for asparagine detection

Punia Sandeep[1] and **Kumar Kuldeep**[2]
[1]Markandeshwer University, India
[2]M.M. Modi College, India

Catharanthus roseus is a plant of medical value and has been used since many years. It secretes a number of alkaloids which imparts the medicinal importance to this plant. L-asparaginase enzyme is produced by bacteria, fungi, yeast, actinomycetes and plants. L-asparaginase is known to treat cancer by breaking down asparagine to aspartic acid and ammonia. Using L-asparaginase extracted from fresh leaves of *Catharanthus roseus* a potentiometric biosensor was developed. The crude enzyme was immobilized in different matrixes such as calcium alginate beads, agar and paraffin wax. The immobilized enzyme was conjugated with Ion Sensing Electrode (ISE) and its mV readings were noted with different asparagine concentrations ranging from 10^{-9} to 10^{-1} M. Calcium alginate beads gave the most reliable response so they were used for the detection of asparagine levels in leukemic serum samples. The asparagine concentration in leukemic serum samples was 10^{-2} to 10^{-3} M. The developed biosensor was reliable, novel, cost effective and easy to use.

sandy17111987@gmail.com

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