Cholinesterase-based biosensor for preliminary detection of toxic heavy metals in the environment and agricultural-based products

ABSTRACT

Heavy metals with high chemical activity from sludge and waste release, agriculture, and mining activity are a major concern. They should be carefully managed before reaching the main water bodies. Excessive exposure to heavy metal may cause toxic effect to any types of organism from the biomolecular to the physiological level, and ultimately cause death. Monitoring is the best technique to ensure the safety of our environment before a rehabilitation is needed. Nowadays, enzyme-based biosensors are utilised in biomonitoring programmes as this technique allows for a real-time detection and rapid result. It is also inexpensive and easy to handle. Enzyme-based biosensors are an alternative for the preliminary screening of contamination before a secondary screening is performed using high-performance technology. This review highlights the current knowledge on enzyme-based biosensors, focusing on cholinesterase for toxic metal detection in the environment.