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A newly emerging trend of Chitosan-Based sensing platform for the Organophosphate pesticide detection using Acetylcholinesterase

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Organophosphate pesticides have been extensively used to protect the agricultural produce from being damaged by the pests while growing and the subsequent degradation in its quality. However, in the process of doing so, the pesticides and their degradation products, enter the soil and water and start accumulating in the food products. Consequently, the remnants of the pesticide or its degradation products concentrate in the food products, they can be potentially damaging to the central nervous system of human beings when consumed. There is the plausibility of deteriorating health in the individual when the key enzyme, Acetylcholinesterase, which is responsible for the orderly functioning of the nervous system, is inhibited by the pesticides. This review gives an insight into the recent approaches towards the rapid sensing of the deleterious pesticides. Numerous sensing platforms, comprising of chitosan as the key element of the immobilization matrix for the subsequent binding of acetylcholinesterase have been highlighted in this study. Chitosan

plays the decisive role in helping maintain the activity of the acetylcholinesterase immobilized by various techniques. The acetylcholinesterase enzyme-inhibition based biosensors pave the way for a speedy and feasible detection of the organophosphate pesticides present in the food articles by bypassing the copious pre-treatments. They also carry the possibility to be used for the real-life sample analysis. Thus, various transducers have been used in combination with the biopolymer chitosan, to produce highly sensitive biosensors for the detection of even trace amounts of these pesticides efficiently.

Speaker Biography

Hitika Hemant Patel currently working as a Food Chemist at Analytical and Environmental Services, Vadodara. Here, She analyzing and testing the various food products and water for their purity and nutritional value. She also serve as a Microbiologist for the analysis of different food and water samples. Her plan in the future is to achieve a PhD. She interested in going for a research in the field of food technology for improving the nutritional value of food products and in the development of new commodities of food.

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