A facile molecularly imprinted polymer-based fluorometric assay for detection of histamine

Histamine is a biogenic amine naturally present in many body cells. It is also a contaminant that is mostly found in spoiled food. The consumption of foods containing high levels of histamine may lead to an allergy-like food poisoning. Analytical methods that can routinely screen histamine are thus urgently needed. In this paper, we developed a facile and cost-effective molecularly imprinted polymer (MIP)-based fluorometric assay to directly quantify histamine. Histamine-specific MIP nanoparticles (nanoMIPs) were synthesized using a modified solid-phase synthesis method. They were then immobilized in the wells of a microplate to bind the histamine in aqueous samples. After binding, o-phthaldialdehyde (OPA) was used to label the bound histamine, which converted the binding events into fluorescent signals. The obtained calibration curve of histamine showed a linear correlation ranging from 1.80 to 44.98 mM with the limit of detection of 1.80 μM. This method was successfully used to detect histamine in spiked diary milk with a recovery rate of more than 85%.