EuroSciCon

10th Edition of International Conference on

Analytical Chemistry

February 28-March 01, 2019
London, UK

Insights Anal Electrochem 2019, Volume 5
DOI: 10.21767/2470-9867-C1-009

Applicability of molecularly-imprinted polymers on the early detection of dengue infection

Buensuceso Clarisse E[1], Florian R del Mundo[1], Nuesca Guillermo M[1], Sabido Portia Mahal G[1] and **Advincula Rigoberto C[1, 2]**

[1]University of the Philippines Diliman, Philippines
[2]Case Western Reserve University, USA

Dengue infection is a vector-borne systemic disease prevalent in several tropical countries with dengue fever or breakdown fever as its most common manifestation. If not treated immediately, dengue infection can develop into more fatal conditions such as dengue hemorrhagic fever and dengue shock syndrome. At present, there is no clinically certified antiviral medication for dengue treatment and as such early diagnosis is very crucial. This study will be using dengue NS1 protein, a protein present at the onset of dengue infection, as its target analyte. Molecular imprinting is a robust technique that has gained attention in the past few years due to its increasing applicability in disease detection. The technique involves the formation of molecular imprints onto the surface of the polymeric material whose size, shape and functionality complements that of the target analyte. In this particular study, epitope imprinting strategy was employed wherein a small portion of the target analyte called the epitope was used as the template for fabrication. Because these epitopes are part of the original target analyte, easy detection can be made using different transduction techniques such as electrochemistry, surface plasmon resonance spectroscopy and fluorescence spectroscopy. Under optimized electrochemical parameters, the monomer, o-phenylenediamine, was electropolymerized in the presence of the epitope template via cyclic voltammetry to form the MIP films. The templates were removed using ACN-H_2O mixture with acetic acid. The fabricated MIP film was then tested for its rebinding, sensitivity and selectivity properties. These tests were conducted using square-wave voltammetry and differential pulse voltammetry. A linear relationship between dengue NS1 protein (in milli Q water) and the ratio in anodic peak current [(I-Io)/Io] was established with a working linear range of 4 ng/mL to 40 ng/mL. The fabricated polymer sensor film exhibited long-term stability, high sensitivity and good selectivity towards dengue NS1 protein. This indicated that the formation of stable sensor films was successful.

clarisse.elica@gmail.com