Electrochemical Impedance Spectroscopy (EIS) *Biosensor for the Detection of Chinese Hamster Ovary- Host Cell Protein (CHO-HCP) Residues in Bio-Therapeutics*

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Production of recombinant therapeutic proteins using cell-based host expression system is regarded as the corner stone in the treatment of various life-threatening diseases including cancer and autoimmune diseases. About 70% of the recently approved therapeutic proteins are produced in Chinese hamster ovary (CHO) cell lines. However, the presence of host cell proteins (HCPs) as low as (1 to 100ppm) will adversely affect the quality, safety and immunogenicity thus affecting the acceptance of the produced bio-therapeutic proteins. Searching for reliable, detectable and generic method for HCP detection is mandatory. In this regard, we assume that Electrochemical Impedance Spectroscopy (EIS) is the method of choice. Polyclonal rabbit antibody raised against CHO cell proteins extract were immobilized to a gold electrode that has been treated with 8-mercaptooctanoic acid and then activating the layer with EDC/NHS. Following the addition of CHO proteins and its further interaction with the rabbit antibodies, the charge transfer resistance is monitored. Notably the addition of successive concentrations of CHO protein extracts increased the charge transfer resistance of the electrochemical system. Results comparison with a commercial ELISA quantification system revealed consistent results with higher sensitivity (240pg/ml) using the electrochemical system. System validation using real and CHO-HCP spiked-therapeutics is in progress.