ICCOB PA 001

Early detection of cancerous cells using electrochemical biosensor

Devyani Goswami, Shristi Das

Amity University Kolkata

Email: devyanigoswami6258338@gmail.com

Cancer is a most dreadful disease that can occur in human body by dividing cells uncontrollably and capable of transporting to any parts of the body by the process of metastasis. According to estimates from the International Agency for Research on Cancer (IARC), in 2018 there were 17.0 million new cancer cases and accounting for nearly 10 million deaths in 2020. It's proven that early diagnosis of cancer helps to reduce the cancer death rate significantly. It is a known fact that immune cells fail to recognize these cancerous cells and fight with them. The main reason is the low concentration of surface antigen on these cancerous cells as well as PDL-1 (Programmed death-ligand 1) protein which deceives the T-cells in recognizing them (tells to ignore the cancer cells). Higher concentration of IFN-γ (interferon gamma secreted from activated T-cells) leads to overexpression of PDL-1 (inhibitor checkpoint) on the tumour cell surface. Thus, IFN-γ is useful for adjuvant immunotherapy for different types of cancer for their capability of inducing senescence in tumour cells. Although IFN-γ remains to be a controversial topic regarding its role in immune status and tumour immunity. However, focusing on the concentration level of IFN-γ in blood samples can determine the presence or absence of cancer. Biosensor based techniques have been recently recommended as a rapid and cost-effective tool for early diagnosis of tumour biomarkers. Electrochemical biosensors are most suitable device for early detection of cancer among individuals. Biosensor based (these) techniques have been recently recommended as a rapid and cost-effective tool for early diagnosis of tumour biomarkers. Attaching an anti-IFN-γ-antibody to the electrochemical biosensor can detect the concentration level of IFN-γ and would help in detection of cancerous cells. This study reviews the possibility of using anti-IFN-γ-antibody on electrochemical biosensors.