Research on Electrochemical Biosensors Based on Topological Materials

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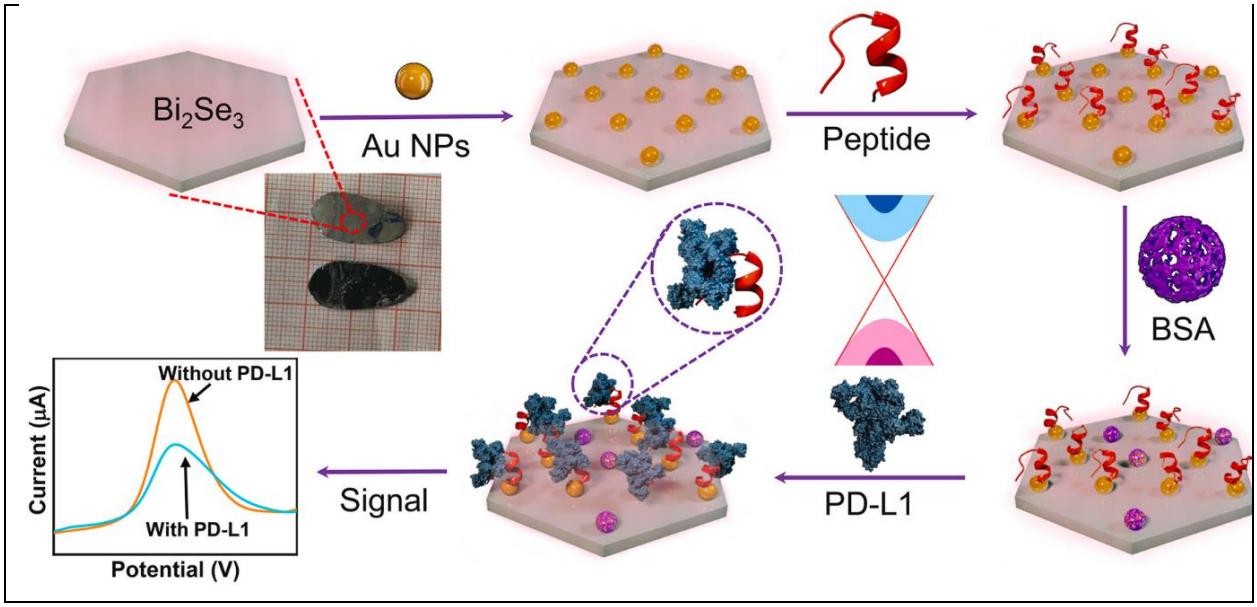
Topological materials are a new class of quantum materials, which have robust surface states with Dirac-like electronic structures. The robust surface state is originated from the intrinsic bulk properties and is immune to the defects and impurities. The use of the topological surface state in the solid-liquid interface for electrochemical detection avoids the interference from defects and impurities. Programmed cell death-1 (PD-L1) is an important immune checkpoint protein. PD-L1 expression has become a predictive biomarker of response to immune checkpoint inhibitors (ICIs) in several types of solid tumors. In this work, we developed a biosensor based on the topological insulator material Bi_2Se_3 with a targeting peptide on it. the biosensor based on topological insulator material with peptide on it has great potential in the application of detecting various biomarkers of diseases.



Pic.1

Bibliography

[1] Yujiu Jiang, Peng Zhu, Jinge Zhao, Shanshan Li, Yetong Wu, Xiaolu Xiong, Xu Zhang, Yuxiang Liu, Jiangyue Bai, Zihang Wang, Shiqi Xu, Minxuan Wang, Tinglu Song, Zhiwei Wang, Weizhi Wang, Junfeng Han, Anal. Chim. Acta 1239, 340655 (2023).