Abstract Submitted
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Electrochemical impedance spectroscopy for graphene surface modification and protein translocation through the chemically modified graphene nanopore[1] PURUSHOTTAM TIWARI, YUPING SHAN, XUEWEN WANG, YESIM DARICI, JIN HE, Department of Physics, Florida International University, Miami, FL 33199 — The multilayer graphene surface has been modified using mercaptohexadecanoic acid (MHA) and 1,2-dimyristoyl-sn-glycero-3-phosphoethanolamine-N-[methoxy(polyethylene glycol)-750] (DPPE-PEG750). The surface modifications are evaluated using electrochemical impedance spectroscopy (EIS). EIS measurements show the better graphene surface passivation with DPPE-PEG750 than with MHA. After modification with ferritin, the MHA modified surface shows greater charge transfer resistance (R_{ct}) change than DPPE-PEG750 modified surface. Based on these results the translocations of ferritin through modified graphene nanopore with diameter 5-20 nm are studied. The translocation is more successful through DPPE-PEG750 modified graphene nanopore. This concludes that that the attachment of ferritin to DPPE-PEG750 modified graphene nanopore is not significant compared to MHA modified pore for the ferritin translocation hindrance. These results nicely correlate with the EIS data for respective R_{ct} change of ferritin modified surfaces.

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