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Abstract

In an attempt to advance GO-based environmental applications, herein we probed the anti-biofouling properties and mechanisms of graphene oxide (GO) surface coating. A flexible and mechanically stable GO membrane was fabricated using vacuum filtration technique and its ability to inactivate bacterial growth and subsequent biofilm formation was investigated. Our preliminary results authenticate that the GO membrane, owing to its unique physicochemical surface properties, exhibits superior antibacterial activity against planktonic cell proliferation. An optical coherence tomography (OCT)-based nondestructive in situ monitoring of bacterial biofilm evolution and behavior revealed that the GO surface initially inhibited biofilm growth for 24 h under continuous flow conditions but was incapable of completely averting biofilm development under long-term operation (48 h). We further confirmed that the observed biofilm