

Title:	Use of UV-vis-NIR spectroscopy to monitor label-free interaction between molecular recognition elements and erythropoietin on a gold-coated polycarbonate platform
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Abstract:	<p>Label-free-based detection is pivotal for real-time monitoring of biomolecular interactions and to eliminate the need for labeling with tags that can occupy important binding sites of biomolecules. One simplest form of label-free-based detection is ultraviolet-visible-near-infrared (UV-vis-NIR) spectroscopy, which measure changes in reflectivity as a means to monitor immobilization and interaction of biomolecules with their corresponding partners. In biosensor development, the platform used for the biomolecular interaction should be suitable for different molecular recognition elements. In this study, gold (Au)-coated polycarbonate was used as a platform and as a proof-of-concept, erythropoietin (EPO), a doping substance widely abused by the athletes was used as the target. The interaction of EPO with its corresponding molecular recognition elements (anti-EPO monoclonal antibody and anti-EPO DNA aptamer) is monitored by UV-vis-NIR spectroscopy. Prior to this, to show that UV-vis-NIR spectroscopy is a</p>

	<p>suitable method for measuring biomolecular interaction, the interaction between biotin and streptavidin was demonstrated via this strategy and reflectivity of this interaction decreased by 25%. Subsequent to this, interaction of the EPO with anti-EPO monoclonal antibody and anti-EPO DNA aptamer resulted in the decrease of reflectivity by 5% and 10%, respectively. The results indicated that Au-coated polycarbonate could be an ideal biosensor platform for monitoring biomolecular interactions using UV-vis-NIR spectroscopy. A smaller version of the Au-coated polycarbonate substrates can be derived from the recent set-up, to be applied towards detecting EPO abuse among athletes. (C) 2014 Elsevier B.V. All rights reserved.</p>
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