

## Ultra-rapid prostate specific antigen biosensing using magnetic mediation

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Prostate specific antigen cancer (PSA) is a 34 KDa serine protease secreted by the epithelial cells of the prostate gland to liquefy the semen. A higher level of PSA (more than 4 ng/ml) might be a strong indication of prostate cancer. Therefore, we try in this work to construct a washless and ultra-rapid method for PSA biosensing useful for sensitive and very cheap medical analysis. The technique is based on the modification of a bare gold surface with a self-assembled monolayer of PSA substrate previously labeled with magnetic nano-carriers. The functionalized strip area dipped onto 1 ng/ml PSA containing sample undergoes visible structural changes within 5 min due to the peptide cleavage and the attraction of the released magnetic beads onto the external magnet. With increased PSA concentrations, we can easily observe a further degradation of the magnetic-organic film. Whereas, no significant bare areas appear from the modified strip using a similar construct of non specific peptide and a concentration up to 100 ng/ml of the enzyme. Those results suggest the specificity and the rapidity of our detection mechanism which can be implemented into more advanced physical transducers to develop a cost-effective lab-on-a-chip device for diagnostic usage.

### Biography

Chiheb Esseghaier got Engineer degree in Industrial Biology from Institut National des Sciences Appliquées et de Technologie (INSAT), Tunis in 2007. After that, he continued his master studies at the same institute in Industrial Biotechnology field and he got the MSc degree in 2008. Then, he moved to Sherbrooke University to work on research project on SPR biosensor and gallium arsenide semi-conductor bio-functionalization. In November 2010, he joined BBBL lab in Institut National de la Recherche Scientifique (INRS) to start Ph.D. program in developing optical and electrochemical biosensors. Chiheb has published several papers in very reputed journals and participated in couple of famous worldwide conferences.

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