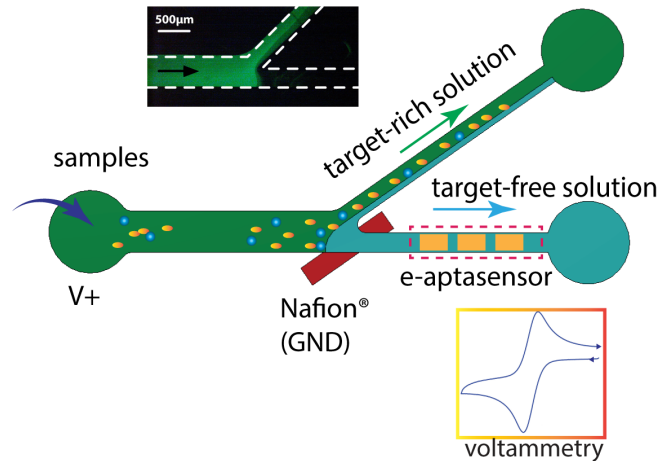


MicroTAS 2017 conference paper supporting materials

Title:

An auto-regeneratable electrochemical aptasensor for continuous monitoring of biomolecules enabled by ion concentration polarization



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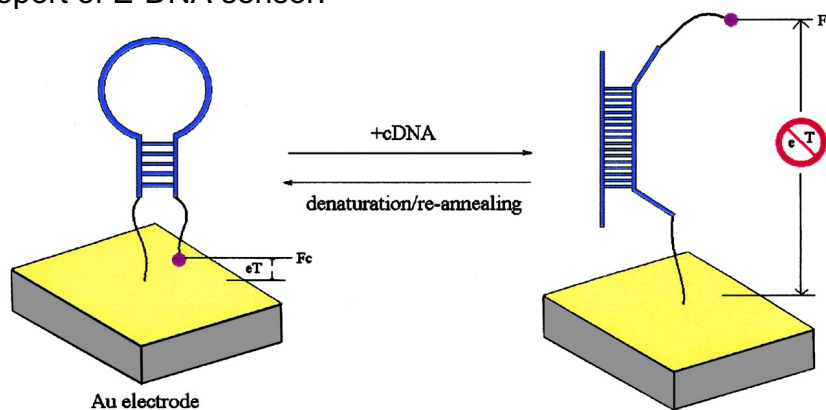
²Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR),

³Singapore Institute for Neurotechnology (SINAPSE), SINGAPORE,

Techniques and their references:

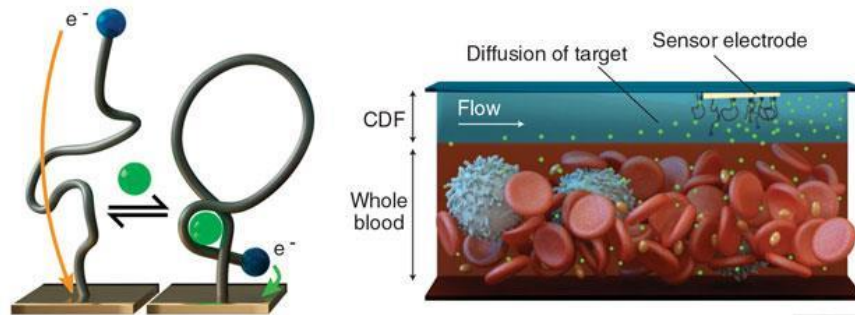
- e-aptasensor (electrochemical-based aptamer sensor)**

-Early report of E-DNA sensor:

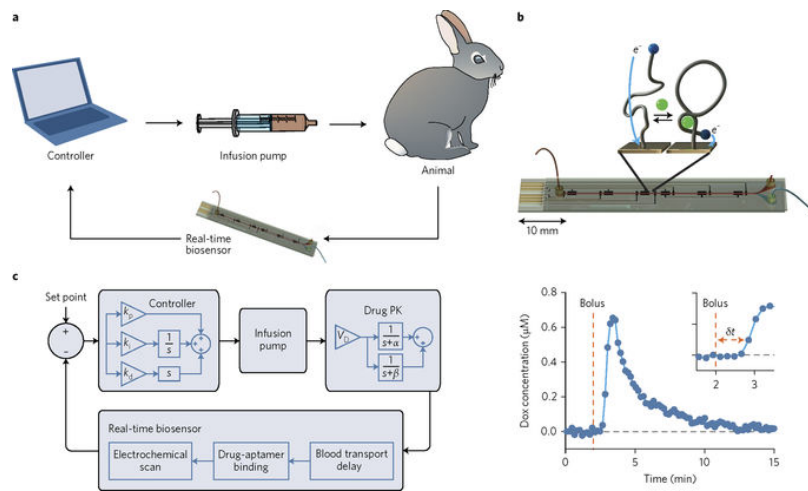


(source: Fan, C., Plaxco, K. W., & Heeger, A. J. (2003). Electrochemical interrogation of conformational changes as a reagentless method for the sequence-specific detection of DNA. *Proceedings of the National Academy of Sciences*, 100(16), 9134-9137.)

-Advanced application of e-aptasensor for real-time disease /drug monitoring



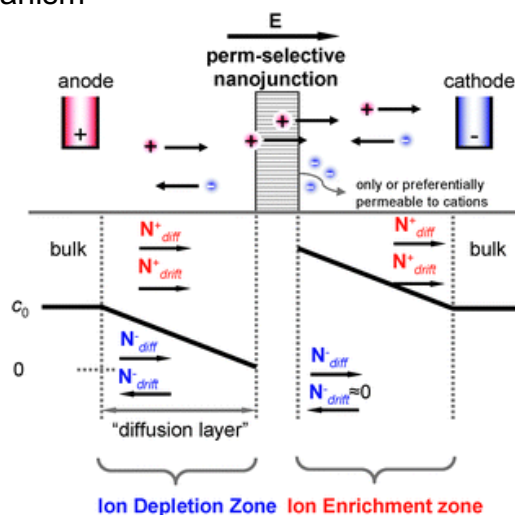
(Source: Ferguson, B. S., Hoggarth, D. A., Maliniak, D., Ploense, K., White, R. J., Woodward, N., ... & Plaxco, K. W. (2013). Real-time, aptamer-based tracking of circulating therapeutic agents in living animals. *Science translational medicine*, 5(213), 213ra165-213ra165.)



(source: Mage, P. L., Ferguson, B. S., Maliniak, D., Ploense, K. L., Kippin, T. E., & Soh, H. T. (2017). Closed-loop control of circulating drug levels in live animals. *Nature Biomedical Engineering*, 1, 0070.)

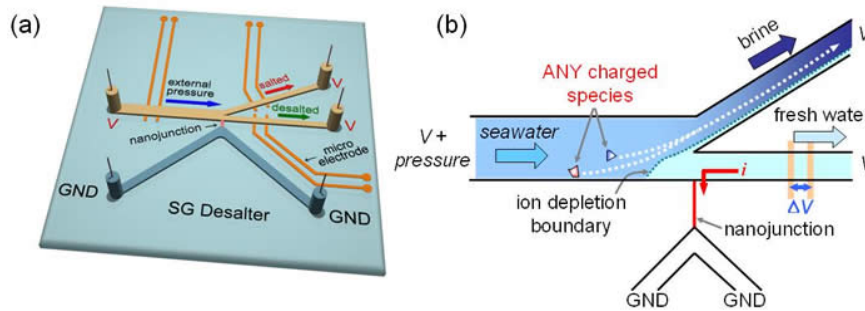
• Ion Concentration Polarization (ICP)

- ICP working mechanism



(source: Kim, S. J., Song, Y. A., & Han, J. (2010). Nanofluidic concentration devices for biomolecules utilizing ion concentration polarization: theory, fabrication, and applications. *Chemical Society Reviews*, 39(3), 912-922.)

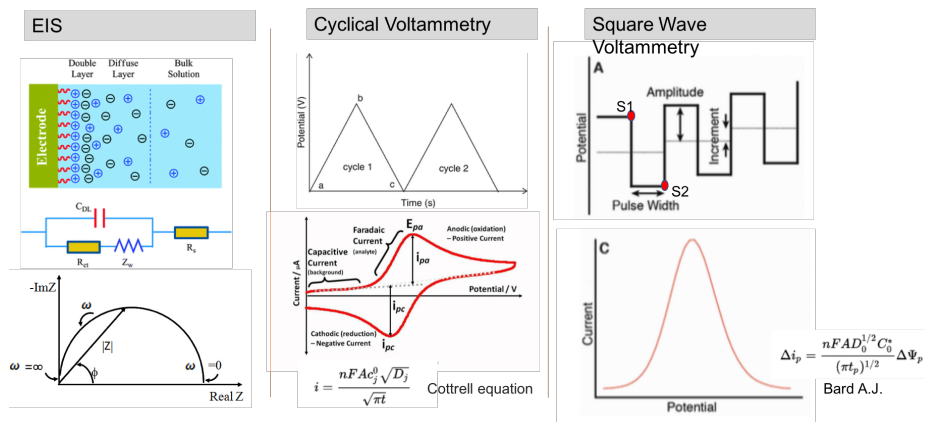
- Application of ICP in desalination



(Source: Kim, S. J., Ko, S. H., Kang, K. H., & Han, J. (2010). Direct seawater desalination by ion concentration polarization. *Nature Nanotechnology*, 5(4), 297-301.)

• Electrochemical methods

- Common methods



(more info: Wang, J. (2006). *Analytical electrochemistry*. John Wiley & Sons.)

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IMB Lab: Integrative Microfluidic Biotechnology: <http://bioeng.nus.edu.sg/imb>

SINAPSE: Singapore Institute of Neurotechnology: <http://www.sinapseinstitute.org/>

IME: Institute of Microelectronics (A*STAR): <https://www.a-star.edu.sg/ime/>