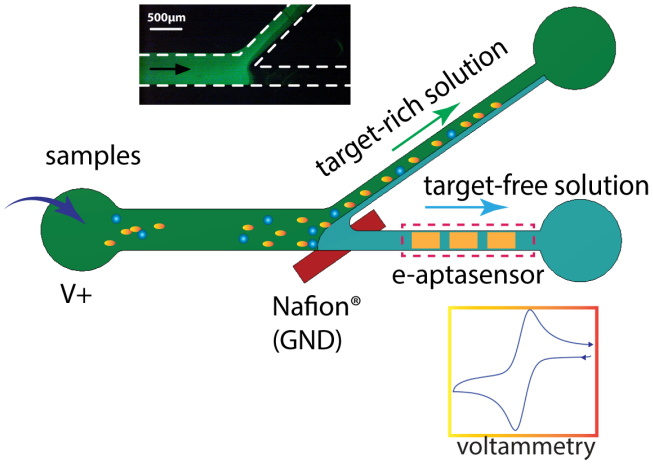
MicroTAS 2017 conference paper supporting materials

Title:

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



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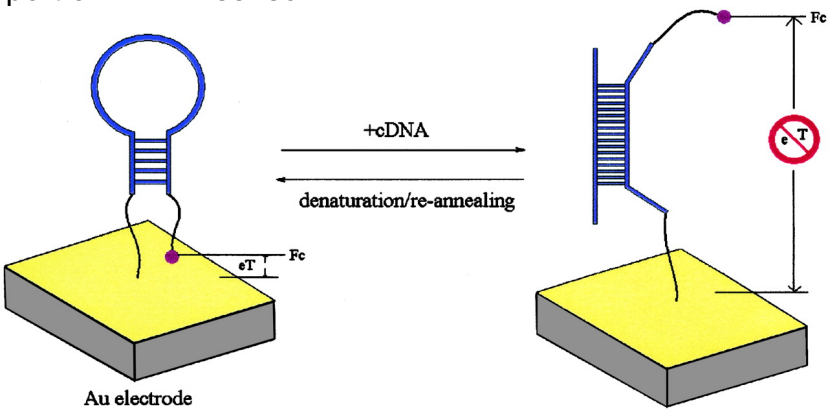
Techniques and their references:

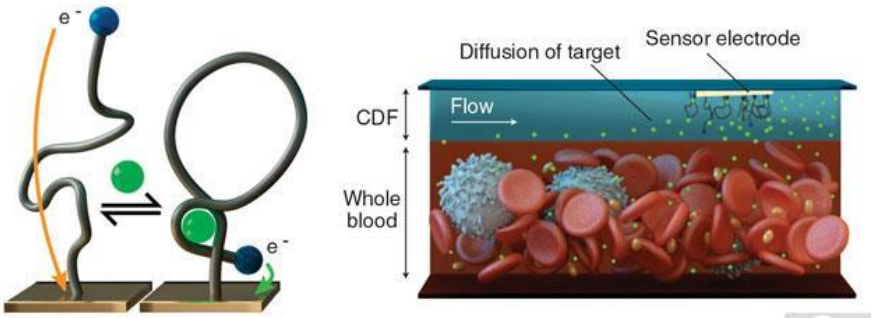
- **e-aptasensor (electrochemical-based aptamer sensor)**

  -Early report of E-DNA sensor:

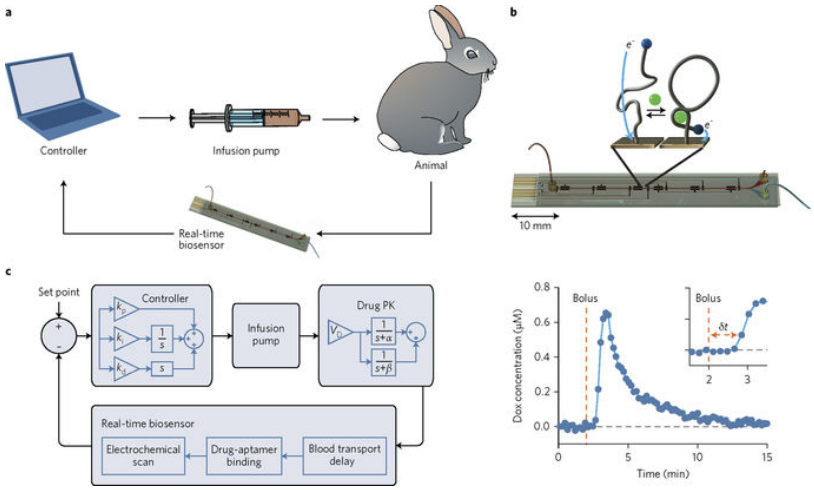


(source: Fan, C., Plaxco, K. W., & Heeger, A. J. (2003). Electrochemical interrogation of conformational changes as a reagentless method for the sequence-specific detection of DNA. *Proceedings of the National Academy of Sciences*, *100*(16), 9134-9137.)

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

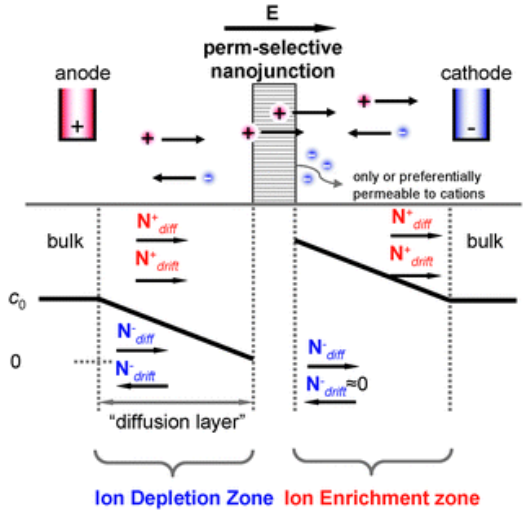


(Source: Ferguson, B. S., Hoggarth, D. A., Maliniak, D., Ploense, K., White, R. J., Woodward, N., ... & Plaxco, K. W. (2013). Real-time, aptamer-based tracking of circulating therapeutic agents in living animals. *Science translational medicine*, *5*(213), 213ra165-213ra165.)



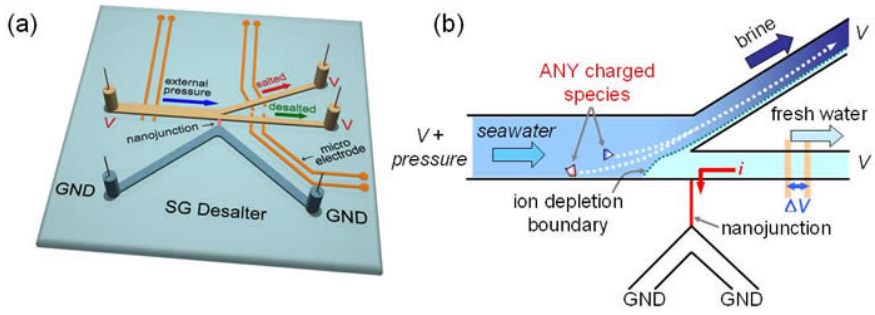
(source: Mage, P. L., Ferguson, B. S., Maliniak, D., Ploense, K. L., Kippin, T. E., & Soh, H. T. (2017). Closed-loop control of circulating drug levels in live animals. *Nature Biomedical Engineering*, *1*, 0070.)

- **Ion Concentration Polarization (ICP)**
  - ICP working mechanism



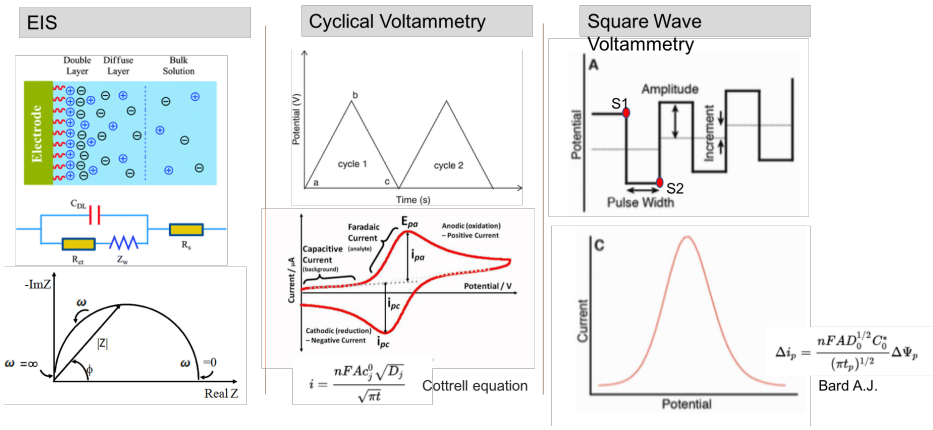
(source: Kim, S. J., Song, Y. A., & Han, J. (2010). Nanofluidic concentration devices for biomolecules utilizing ion concentration polarization: theory, fabrication, and applications. *Chemical Society Reviews*, *39*(3), 912-922.)

- Application of ICP in desalination



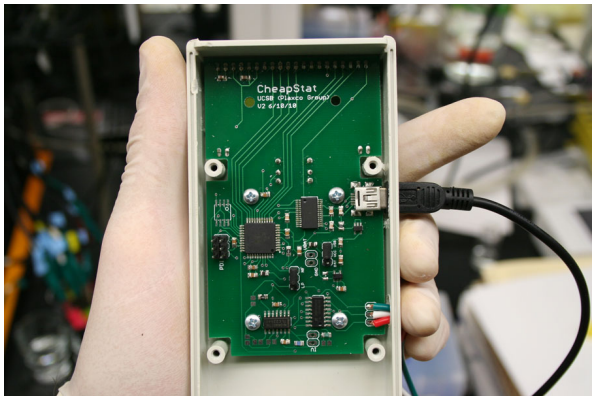
(Source: Kim, S. J., Ko, S. H., Kang, K. H., & Han, J. (2010). Direct seawater desalination by ion concentration polarization. *Nature Nanotechnology*, *5*(4), 297-301.)

- **Electrochemical methods**
  - Common methods



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

- **Integration with IC**



(source: Rowe, A. A., Bonham, A. J., White, R. J., Zimmer, M. P., Yadgar, R. J., Hobza, T. M., ... & Plaxco, K. W. (2011). CheapStat: an open-source,"Do-It-Yourself" potentiostat for analytical and educational applications. *PloS one*, *6*(9), e23783.)

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