Saptasense Protocol

Final electrode preparation and testing

Methods 3-5:

- Chitosan solution
  - 1% chitosan solution is created by dissolving chitosan in 2% acetic acid, vortexing and incubating at 37C until dissolved. This solution is then brought up to a pH from 4.5-5 using NaOH.
- GO Chitosan solution:
  - 50% of the 1% chitosan was combined with 2G/L GO solution to give 0.5% chitosan, 1% acetic acid, 1G/L GO solution
- Gold electrode prep:
  - Each gold electrode was washed with DI water and cleaned by electrochemical cycling in 0.1M sulfuric acid for 0.6 to 1.6V at scan rate 0.5V/s for 100 scans.
  - Chitosan was applied to the electrode by submerging the working, reference, control electrodes in the 1% chitosan solution and applying a constant current of 25µA (200 µA/cm2) for 120s
  - These electrodes were washed with DI water and then soaked in 1M NaOH for 5 minutes.
- Carbon electrode prep:
  - Each carbon electrode was washed with DI water and inserted into the GO Chitosan solution where CV was run on them from 0 to -1.5 at 0.15V/s for 24 cycles.
  - These were rinsed with DI water and allowed to dry
- Methylene blue intercalation:
  - 10uL of 20mM Methylene blue was dropped on dry modified gold and carbon electrodes and allowed to rest for 5 minutes before thorough washing with pH 8 Tris HCL

Layout of our assay:

- 6 carbon electrodes and 6 Gold electrodes all fully modified up through glutaraldehyde
  - 2 of each type were no-aptamer control with no aptamers attached
  - 2 were no sarcosine control
  - 2 of each were exposed to sarcosine
- 2 DPV cycles 0V to 0.8V were run on all electrodes before sarcosine (or PBS in place of sarcosine) addition to determine what normal aptamer DPV output looked like
- Non-control were incubated with 100uL of 1M sarcosine, control with PBS for 10 minutes
- This solution was washed off with PBS before each electrode then had DPV (same parameters as initial cycles) run on them again.