Investigating the Purpose of Neurotransmitters

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Background

• Neurotransmitters are important chemicals in the brain that cause transient effects
• Two important neurotransmitters are dopamine and serotonin
• Over-excitation of dopamine pathway is thought to cause schizophrenia
• Parkinson’s disease is believed to be caused by the destruction of dopamine pathways
• Dopamine pathways are also extremely involved in drug addiction and rewarding behavior
• Serotonin is regulated in the treatment of depression.
Research

• Known Information:
  – Fast Scan Cyclic Voltammetry (FSCV) measures neurotransmitter concentration at the instant it is released.
  – The concentration is measured in electric current change caused by the oxidation and reduction of the neurotransmitter.

• Goal of research:
  – Connect a known of concentration of neurotransmitters to a specific current change through a process called calibration.
Project Results

- It was found that a concentration of 25.2 uM of Oxygen correlates to 3 nA current change, a concentration of 37.5 uM correlates to a 4.3 nA current change and a concentration of 50 uM correlates to a 7.9 nA current change.