Citalopram (C<sub>20</sub>H<sub>21</sub>FN<sub>2</sub>O)

Citalopram is considered a Selective Serotonin Reuptake Inhibitor (SSRI).

**MDD: Top Ten of the most common antidepressant drugs sold in the US used to treat major depressive disorders (MDD). Around 21% of the people living in the US in 2023 have MDDs.**

Serotonin C<sub>10</sub>H<sub>12</sub>N<sub>2</sub>O

Neurotransmitter that helps stabilize mood feelings, and happiness. It also helps with healing and sleeping which are vital for the health and development of the human body. It comes from an amino acid known as tryptophan.

Citalopram Toxicity

About Citalopram Function: An antidepressant that inhibits serotonin production is linked to the power and effect of serotonin. Being an SSRI, it inhibits the CNS neuronal reuptake of serotonin.

Biotransformation: Biotransformation of citalopram is hepatic (relating to the liver), with a half-life of 35 hours.

Hepatotoxicity

Citalopram can affect the liver due to its metabolism. Risk of QT Prolongation is often found with patience with impaired liver function (the hearts contraction and relaxation).

Serotonin

Measuring the Citalopram

**Challenge**
- Expensive
- Long Run time
- Expert Technician Required

**Aim**
- Cost Effective
- Quick Response
- At-Home Measurement

**Potentiometry:** Measures the change of ion selectivity found in chemical reactions to monitor substance concentration.

\[ E_{cell} = E^0 - \left( \frac{RT}{nF} \right) \ln(Q) \]

Measuring the Citalopram is considered a Selective Serotonin Reuptake Inhibitor (SSRI).

**Dosage-Time Response**

- 45.8
- 47.1
- 47.5
- 43.9

- 54.3
- 53.2
- 42.9
- 44.0

- 12.1
- 80.1
- 64.3
- 66.3

- 96.5
- 62.4

Sheet Resistivity Measurements

Contact Angle Measurements

**Conclusion**

- Successfully build a cost-effective LIG citalopram potentiometric sensor.
- Optimized to address challenges associated with form factor
- Illustrated promising response, sensitivity, and stability
- Demonstrated the potential to be used in the real world for quick and accurate sensing of the Citalopram.

**References**


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