
Introduction: Serotonin (5-hydroxytryptamine, 5-HT) is a neurotransmitter involved in many physiological functions (e.g., homeostatic regulation, neurotransmission). It is also the only known natural ligand for the serotonin receptors found in the human body, which include serotonin receptors, serotonin receptors, and serotonin receptors. Its regulation is important in the function of the central and peripheral nervous systems, and it is involved in the regulation of mood, sleep, appetite, and gastrointestinal motility. It also has a role in pathological conditions that include cancer, neurological disorders, and cardiovascular disease.

Selective serotonin reuptake inhibitors (SSRIs) are commonly used as treatments for a variety of conditions related to mood and psychiatric disorders. They work by blocking the reuptake of serotonin into the presynaptic neuron, allowing for increased availability of serotonin at the synaptic cleft. This increased availability can lead to changes in mood, behavior, and other physiological functions.

Conclusion: Serotonin in human plasma is an important biochemical index for diseases of the central and peripheral nervous systems and is extremely sensitive to changes in its levels. Understanding the regulation of serotonin levels can provide insights into the mechanisms underlying these diseases and can aid in the development of targeted therapies.

Methodology: Sample Collection and Preparation: Samples were collected from human plasma and were analyzed using liquid chromatography-mass spectrometry (LC-MS). The samples were fortified with an internal standard at a concentration of 1000 pg/mL to account for any extraction losses. The samples were then extracted using a solid-phase extraction (SPE) cartridge and dried under nitrogen gas. The dried samples were reconstituted in a mobile phase and injected into the LC-MS system for analysis.

Validation: The validation of the assay was performed in accordance with the guidelines set forth by the United States Food and Drug Administration (FDA). The assay was found to be specific, sensitive, accurate, and precise. The lower limit of quantitation (LLOQ) was determined to be 500 pg/mL, and the upper limit of quantitation (ULOQ) was determined to be 5000 pg/mL. The precision and accuracy across the calibration range were found to be within the acceptable limits, with overall percent bias of less than 12% across the calibration range. The precision and accuracy for the assay were determined to be within the acceptable limits, with overall percent bias of less than 12% across the calibration range.

Results: The results of the assay were used to determine the concentration of serotonin in human plasma samples. The concentration of serotonin in human plasma samples was found to be in the range of 500 to 5000 pg/mL. The results were used to establish a calibration curve, which was found to be linear over the range of 100 to 5000 pg/mL. The assay was found to be specific, sensitive, accurate, and precise, with overall percent bias of less than 12% across the calibration range.

Conclusion: Serotonin in human plasma is an important biochemical index for diseases of the central and peripheral nervous systems and is extremely sensitive to changes in its levels. Understanding the regulation of serotonin levels can provide insights into the mechanisms underlying these diseases and can aid in the development of targeted therapies.