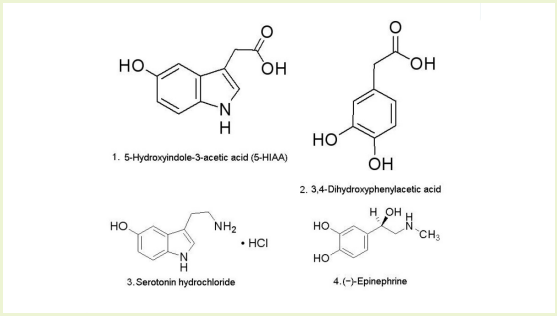
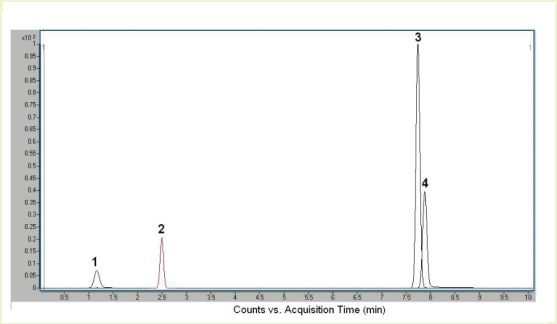
Serotonin, Metabolites & Analogs

Analysis of neurotransmitters (NT) and their metabolites without Fluorescent Tags





Notes: Neurotransmitters are important natural molecules that play significant roles in the mammalian central nervous system. The method presented is sensitive enough to be used to quantitate the metabolite concentrations in blood samples and may be applicable to relevant clinical studies.

Method Conditions

Column: Cogent Diamond Hydride™, 4µm, 100Å

Catalog No.: 70000-15P-2

Dimensions: 2.1 x 150 mm

Solvents: A: DI H_2O/ 0.1% formic acid
B: Acetonitrile/ 0.1% formic acid

Gradient:

time (min.)	%B
0	95
2	95
4	70
5	70
7	45
8	45

Injection vol.: 1µL

Flow rate: 0.4 mL/min

Detection: ESI – pos - Agilent 6210 MSD TOF mass spectrometer.

Sample: Mix of 4 compounds: 153.5µg /mL of each in water. Dilution: 30µL of the mix sample into 70µL of 0.1% formic acid in acetonitrile.

Peaks: 1. 5-hydroxy-3-indole acetic acid (5-HIAA) metabolite of serotonin 192 m/z
2. 3,4-dihydroxyphenylacetic acid (DOPAC) 169 m/z
3. Serotonin 177 m/z
4. Epinephrine 184 m/z

t_0: 1.44 min

Discussion

An Aqueous Normal Phase chromatographic method, coupled with ESI detection (LC-MS), was developed for the analysis of neurotransmitters and their metabolites. Current HPLC-based methods which are used to analyze NT and metabolites in biological fluids have several drawbacks since they often require a derivatization to convert NT into a fluorescent molecule or using ion pairing reagents in the chromatographic process. The ion pair reagents typically are not MS compatible or hinder MS detection. Mass spectrometry (MS) coupled to HPLC with Diamond Hydride column is a powerful technique which can be used within the field of analytical toxicology or can be used for accurate determination of NT and metabolites in biological samples for routine assessment of physiological or various pathological processes.

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