ASSURANCE LABORATORIES

Liquid Chromatography & Tandem Mass Spectrometry Testing (LC/MS/MS)

Quantification of Compounds within Urine, Blood, and Saliva

What is LC/MS/MS?

Combining the liquid chromatography and mass spectrometry analytical techniques in this sequence (LC/MS/MS) allows for the highest degree of accuracy and specificity in compound identification. Liquid chromatography separates compounds within a sample based on their differential affinities for the liquid solvent vs. the column matrix that the solvent carries the sample through. Compounds with a greater affinity for the matrix will be retained on the column longer and therefore elute from the column later. Each compound has a specific retention time (RT) based on its chemical affinity. After eluting from the LC, the compounds are then directed to the source of the mass spectrometer where they are desolvated (converted from liquid to gas) in preparation for the first round of mass spectrometry, which separates compounds by their mass to charge ratio (m/z).

Mass spectrometry utilizes alternating direct current (DC) and radio frequency (RF) voltages to effectively serve as a mass filter, allowing only compounds with a chosen m/z to pass through. After a compound passes the first round of MS, it enters a collision cell where it is bombarded with nitrogen (a stable, inert gas, to prevent unexpected chemical reaction) to fragment the compound into smaller pieces. These pieces are then subject to the second round of MS. The chosen mass fragments then pass through to the detector. Because a given compound will tend(on a population basis) to fragment the same way every time (Breaking at its weakest points), the second round of MS provides very specific information about compound identity.

Sample Requirements:

Whole Blood:

2mL minimal; Recommended 4mL with EDTA (lavender tubes)

Urine

2ml minimal

Saliva

1 saliva swab, with capacity indicator

Turn Around Time:

48 hours