Immunoassay vs. mass spectrometry: What is the difference?

Immunoassay Drug Screens	Mass spectrometry (LC-MS/MS)*
○ Identify drug class: • E.g. Amphetamines • E.g. Benzodiazepines	○ Identify specific drugs and/or metabolites: • E.g. Amphetamine, methamphetamine, MDMA • E.g. Temazepam, oxazepam, etizolam
○ Turnaround time ≤ 1 hour	○ Turnaround time up to 3 days
○ Limited sensitivity and specificity	○ Optimal sensitivity and specificity
○ Higher detection limits	○ Lower detection limits

Which result is the *right* result?

Immunoassay drug screens are considered *presumptive* tests

LC-MS/MS (broad-spectrum urine drug screen) is considered *definitive* testing

* SMH broad-spectrum urine drug screen

Drug Screen Q&A: positive immunoassay, negative LC-MS/MS

Question

My patient had a positive immunoassay screen for benzodiazepines but was negative on the LC-MS/MS broad-spectrum urine drug screen (no benzos were reported). Which result should I trust?

Answer

Trust the LC-MS/MS broad-spectrum urine drug screen.

Immunoassays can only identify **drug class** and can potentially cross-react with off-target substances to produce false-positive or false-negative results.

LC-MS/MS tests can identify **specific drugs and metabolites**, are more sensitive (lower detection limits), and less prone to false-positive or false-negative results.

If you ever need assistance interpreting a urine drug screen result, you can always contact the Toxicology Laboratory at 416-864-6060 ext. 2458 to be transferred to the Clinical Biochemist on-call

Drug Screen Q&A: drug not identified on the LC-MS/MS broad-spectrum drug screen

Question

My patient admitted to taking drug X, but I didn't see it listed on the LC-MS/MS report. How come?

Answer

The LC-MS/MS broad-spectrum urine drug screen is a TARGETED assay.

It can only identify **drugs included in our SMH drug library**. We do our best to provide a comprehensive list of illicit and prescription medications, but there may be some drugs that we cannot detect.

If you would like to request a drug to be added to our library, please contact the Toxicology Laboratory at 416-864-6060 ext. 2458 to be transferred to the Clinical Biochemist on-call