ANSI/ASB Standard 113, First Edition, 2023

Standard for Identification Criteria in Forensic Toxicology

Interpretation

Request for Interpretation:

Our laboratory has a couple of interpretation questions regarding the recently published Standard 113 "Standards for Identification Criteria in Forensic Toxicology." We are a small public laboratory assessing the potential need for new instrumentation or increased funding for consumable costs required to get in compliance with the standard. We would appreciate any clarification you could provide.

We perform DUID analysis of blood and due to limited instrumentation, we have several substances that are identified either by duplicate LCMSMS or duplicate full scan GCMS extractions. We use two separate aliquots for each technique, though the extraction and instrumentation techniques are identical. We are trying to evaluate our current practices for compliance with the new standard and were wondering if you had clarification about the following two sections:

4.3.1.3 "Repetition of the same technique on the same matrix does not earn additional points toward the total needed for identification. For example, repeating the same GC-MS analysis of blood does not earn additional points for an identification."

4.1.5, "Although one hyphenated instrumental technique (e.g., LC-MS/MS) may be sufficient to achieve identification, this alone does not ensure the reliability, reproducibility, quality, and integrity of results. As a matter of good laboratory practice, two aliquots of the same or different matrices from the same subject should be independently analyzed."

Our understanding is LCMSMS (two transitions monitored) is worth five points, which satisfies requirements for identification. Would duplicate LCMSMS analysis be acceptable to confirm a substances even if the second technique did not gain any additional identification points?

We are also trying to determine points for GCMS analysis with or without a concurrent standard analyzed:

Given 4.2.2 "Identification points for chromatographic and electrophoretic separations are only awarded when a reference standard/positive control is concurrently analyzed", would a GCMS run without a concurrent standard earn 2 points for a low resolution full scan MS match, or 0 points since there is no concurrent standard and we have to take the GCMS as a hyphenated singular technique.

Additionally, we have been trying to determine an acceptable time range for "Concurrently Analyzed" which appears to be defined as "close to the same time". Does this mean something needs to be on the same batch to be considered concurrent? Would it be acceptable to run a standard later the same week? Could we internally define "concurrent" as something like "with the same mobile phase and absent column maintenance." Can the definition be different for GC vs. LC runs?

Thank you in advance for any assistance or guidance that you can provide regarding these standards.

Response:

Thank you for requesting clarification on ANSI/ASB Standard 113, *Standard for Identification Criteria in Forensic Toxicology*.

A properly validated liquid chromatography/mass spectrometry/mass spectrometry (LCMSMS) analytical technique in which two different low resolution precursor product ion transitions are monitored (with appropriate ion ratios as defined in ANSI/ASB Standard 098*, Standard for Mass Spectral Analysis in Forensic Toxicology*) and a concurrently analyzed reference standard/positive control of the analyte of interest does yield five (5) identification points (1 point for chromatography + 2 points each for Low Resolution MS^n, precursor product ion transitions).

Duplicating the same technique on the same matrix for no additional identification points will meet the recommendation of Section 4.1.5, provided the two aliquots are independently analyzed.

When a reference standard or positive control of the analyte of interest is not included with a chromatographic technique, as with your example of GCMS, the standard does allow one to claim the points for the detector that is used; however, there are no points for the chromatographic technique. Further, Section 4.2.2 states: "At least one chromatographic or electrophoretic separation technique, including a concurrently analyzed reference standard/positive control of the analyte of interest, shall be performed to achieve identification." So at least one technique must include a chromatographic separation with a concurrently analyzed reference standard or positive control.

The outer bounds as to what constitutes "concurrently analyzed" was discussed by the ASB Toxicology Consensus Body. The opinion was that there are numerous variables that must be considered in establishing what is reasonable for these outer bounds of time. Therefore, the document allows laboratories to consider their own operations and define what is reasonable for their method. It may be expected that the laboratory document what they define as "concurrently analyzed" and be able to defend this time frame to accreditation bodies and legal entities.

We hope these explanations are helpful to your understanding of ANSI/ASB Standard 113, *Standard for Identification Criteria in Forensic Toxicology*. Your support of the development and use of ANSI/ASB standards and best practice recommendations is greatly appreciated.