SOP-072 LC-MS Test Mix Evaluation and Troubleshooting

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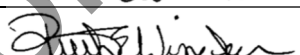
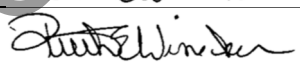
SOP Name: Review of Evidence Storage Room Access (Room 2607)		SOP #: 060
North Carolina Office of the Chief Medical Examiner Toxicology Laboratory	**Revision:** 1 – Normalized language throughout (LC-MS) 2.2.2 – Added Orbi trap	**Revision Date/Initials:** JOB – 09/12/2017

Approving Authority Name	Approving Authority Signature	Approval Date
Ruth E. Winecker, Ph.D.		04/15/2015
Ruth E. Winecker, Ph.D.		06/10/2016
Ruth E. Winecker, Ph.D.		09/12/2017

SOP-072 LC-MS Test Mix Evaluation and Troubleshooting

1. **Principle**

1.1. Prior to beginning an analytical run on an LC-MSLC-MS or LC-MS-ion trap instrument a test-mix should be run prior to analysis, when able, to ensure acceptable performance.

1.1.1. The test mix could be either a neat containing the analytes to be analyzed or an injection of an extracted standard or QC.

2. **Evaluation and Troubleshooting Guide**

2.1. Chromatography

2.1.1. Make sure peaks are present, if not:

2.1.1.1. Check that the right vial was injected

2.1.1.2. Make sure the correct instrument and processing method is chosen, in accordance with the assay SOP.

2.1.1.3. Check the volume of the LC solvents.

2.1.1.4. Check for leaks or clogs in the LC-MS system.

2.1.1.5. Check that the mass spectrometer is working properly by observing signal/scans in TSQ-Tune program

2.1.1.6. Consult with the LC-MS chemist to troubleshoot the problem

2.1.2. Unless specific to the analyte, make sure that the peaks do not front, tail or have shoulders. If chromatography is poor:

2.1.2.1. Inject another neat to make sure it is not extraction related.

2.1.2.2. Make sure the correct instrument method is chosen, in accordance with the assay SOP.

2.1.2.3. Check to see when the column was last replaced, and replace if necessary.

2.1.2.4. Consult with the LC-MS chemist

2.2. Mass spectrometry

2.2.1. For triple quadrupole mass spectrometers:

2.2.1.1. Check that calculated ion ratio agrees with the target, if not:

2.2.1.1.1. Check instrument worksheet for the last time the transfer ion tube, housing, and sweep cone was cleaned.

2.2.1.1.1.1. Clean if necessary or consult LC-MS chemist

2.2.1.1.2. Check instrument worksheet for the last time the instrument had a preventative maintenance, calibration, or cleaning of Q0/Q00.

2.2.1.1.2.1. If needed, consult LC-MS chemist

2.2.2. For LC-MS-ion trap and Orbi Trap instruments:

2.2.2.1. Check that the full scan spectra contains the expected ions in approximately the expected ratios.

2.2.2.1.1. Check instrument worksheet for the last time the transfer ion tube, housing, and sweep cone was cleaned.

2.2.2.1.1.1. Clean if necessary or consult LC-MS chemist

2.2.2.1.2. Check instrument worksheet for the last time the instrument had a preventative maintenance, calibration, or cleaning of Q0/Q00.

2.2.2.1.2.1. If needed, consult LC-MS chemist

2.3. Instrument and Processing Methods

2.3.1. If there appears to be a problem with the instrument or processing methods, inform the LC-MS chemist.

3. **Maintenance**

3.1. If routine maintenance is suggested see SOP-071 LC-MS Routine Maintenance and references therein.

3.1.1. For procedures and cleaning beyond the scope of SOP-071 please consult the LC-MS chemist