









CS

**REVIEWED**  
By Tamara Salazar at 9:22 am, Oct 20, 2022

10/19/2022

**Worklist: 6134**

<u>LAB CASE</u>	<u>ITEM</u>	<u>ITEM TYPE</u>	<u>DESCRIPTION</u>	
M2022-3767	3	UCK	AM 27 Urine Cannabinoids Confirmation by LC-QQQ	
M2022-3905	3	UCK	AM 27 Urine Cannabinoids Confirmation by LC-QQQ	
P2022-2915	3	UCK	AM 27 Urine Cannabinoids Confirmation by LC-QQQ	
P2022-2920	1	UCK	AM 27 Urine Cannabinoids Confirmation by LC-QQQ	
P2022-3034	1	UCK	AM 27 Urine Cannabinoids Confirmation by LC-QQQ	
P2022-3042	1	UCK	AM 27 Urine Cannabinoids Confirmation by LC-QQQ	
P2022-3094	1	UCK	AM 27 Urine Cannabinoids Confirmation by LC-QQQ	
P2022-3104	1	UCK	AM 27 Urine Cannabinoids Confirmation by LC-QQQ	

## AM# 27: Quantitation of THC and Metabolites in Blood and Urine by LC-MS/MS

Extraction Date: 10/18/2022

Analyst: Celena Shrum

Plate lot#: 220309

Plate Retest Date: 09/09/2022

**Mobile phase A:** 0.1% Formic Acid in LCMS Water

**Mobile phase B:** 0.1% Formic acid in Acetonitrile

**Blank Blood Lot:** Lampire 22B52015-1

**Column:** Phenomenex Phenyl Hexyl (4.6x50mm, 2.6um)

**LCMS-QQQ ID:** 069901

**Blank Urine Lot:** POC021022

### Pre-Analytic:

- 1. Check levels of mobile phases and needle wash refill as needed. Ensure waste is not full.
- 2. Ensure correct column is installed and begin mobile phase flow allow to equilibrate ~ 30 minutes.

### Analytic:

- 1. Remove standards, plate, controls, and samples from cold storage. Allow to reach room temperature.
- 2. Urine hydrolysis: add 1.5mL urine to blank plate, add 250µl 1N KOH. Shake and incubate at 40 degrees for 15 minutes.
- 3. Using a calibrated pipette, add **1000µl blood or 1000µl hydrolyzed urine** into the appropriate wells of the analytical (standards) plate. **Pipette ID: #42**
- 4. Place on shaking incubator at ambient temp., 900rpm for 15 minutes.
- 5. Add **500µL of 0.1% formic acid in water to blood samples or 500µl of saturated phosphate buffer to urine samples** to the appropriate wells of the analytical plate.
- 6. Place on shaking incubator at ambient temp., 900rpm for 15 minutes.
- 7. Transfer **800µL of blood+acid mixture or urine+acid** to corresponding wells of SLE+ plate.
- 8. Apply positive pressure for approx. 10-15 seconds (or until no liquid remains on top of sorbent). **(Load at 85-100 PSI- Selector to the right)** Manifold ID: 067104
- 9. Wait 5 minutes.
- 10. Add **2.25mL MTBE. (Add in 3 increments of 750uL)**
- 11. Wait 5 minutes.
- 12. Apply positive pressure for approx. 15 seconds. **(10-15 PSI- Selector to the left).**
- 13. Add **2.25mL Hexane. (Add in 3 increments of 750uL)**
- 14. Wait 5 minutes.
- 15. Apply positive pressure for approx. 15 seconds. **(10-15 PSI- Selector to the left).**
- 16. Remove plate containing eluate. Place on SPE Dry and evaporate to dryness at approx. 35°C. **SPE Dry ID: 067103**
- 16. Reconstitute in **100µL 100% MeOH** and heat seal plate with foil. Place in autosampler and run worklist.

### Post-Analytic

- 1. Create batch and process data.
- 2. Make any necessary integration changes, Curve weighting of Linear 1/x with  $r^2$  values  $\geq 0.98$  for each analyte
- 3. RT +/- 3% or 0.100 min, whichever is greater, +/- 20% Accuracy for greater than (+/- 30% for 10ng/ml or less). Ion ratios must be within +/- 20% of the averaged calibrators
- 4. Case sample response for THC 1ng/mL and OH-THC 3ng/mL (quantitative), Carboxy-THC: 5ng/mL (qualitative only) will be reported. Samples with a THC or OH-THC response over 50 ng/mL will be reported out as greater than 50 ng/mL.
- 5. Did all QCs pass for each analyte? (if not, describe in comments section)
- 6. Enter QCs into control charting.
- 7. Central File Packet to include: LIMS Worklist, Method Checklist, Calibration and Control Reports

COMMENTS: Only THC-COOH evaluated. C-THC curve range: 10-250. Per the method, an external control was included in the run since it was after the plate re-test date.

	1	2	3	4	5	6
a					P2022-2915-3	QC 1
b					M2022-3905-3	cal 100 ng
c					M2022-3767-3	cal 50 ng
d				P2022-3104-1	Urine Ext. Ctri.	cal 25 ng
e				P2022-3094-1	NEG Urine	cal 10ng
f				P2022-3042-1	Blood Ext. Crtl.	cal 5 ng
g				P2022-3034-1	NEG Blood	cal 3 ng
h				P2022-2920-1	QC 2	cal 1ng



Idaho State Police  
Forensic Services

CS

---

**AM #26 Screening of THC and Metabolites and AM #27  
Confirmation of THC and Metabolites Blood External  
Control Prep Sheet**

---

**Methanol External Control Solution (Lot: WS101322)**

100  $\mu$ L of 100  $\mu$ g/mL C-THC in 9900  $\mu$ L MeOH

*Approximate concentration 1ug/mL.*

<i>Component</i>	<i>Source</i>	<i>Source Lot Number</i>	<i>Expiration Date</i>
Methanol (LCMS)	Fisher	215245	-
C-THC	Cerilliant	FE08011801	08/31/2023
Prepared:	10/13/2022		
Expires:	08/31/2023		
Prepared By:	Celena Shrum		

**Blood External Control Solution (Lot: 101822)**

200 ul of methanol external control solution was added to 9800 ul of blood.

*Approximately 20ng/mL*

<i>Component</i>	<i>Source</i>	<i>Source Lot Number</i>
Negative Blood	Lampire	22B52015-1
Methanol External Control Solution	-	WS101322
Prepared:	10/18/2022	
Expires:	08/31/2023	
Prepared by:	Celena Shrum	



**Idaho State Police  
Forensic Services**

---

**AM #26 Screening of THC and Metabolites and AM #27  
Confirmation of THC and Metabolites Urine External  
Control Prep Sheet**

---

**Methanol External Control Solution (Lot: WS101322)**

100  $\mu$ L of 100  $\mu$ g/mL C-THC in 9900  $\mu$ L MeOH

*Approximate concentration 1ug/mL.*

<i>Component</i>	<i>Source</i>	<i>Source Lot Number</i>	<i>Expiration Date</i>
Methanol (LCMS)	Fisher	215245	-
C-THC	Cerilliant	FE08011801	08/31/2023
Prepared:	10/13/2022		
Expires:	08/31/2023		
Prepared By:	Celena Shrum		

**Urine External Control Solution (Lot: 101322)**

200  $\mu$ L of methanol external control solution was added to 9800  $\mu$ L of urine.

*Approximately 20ng/mL each*

<i>Component</i>	<i>Source</i>	<i>Source Lot Number</i>
Negative Urine	Pocatello Lab	POC021022
Methanol External Control Solution	-	WS101322
Prepared:	10/13/2022	
Expires:	08/31/2023	
Prepared by:	Celena Shrum	

**Idaho State Police  
Forensic Services**

**Request for Departure from an Analytical Method or Quality Standard**

---

Deviation Number (assigned by QM): TOX-22-02

Date of Request:

03/02/2022

Requestor/Discipline:

Celena Shrum/Toxicology

Analytical Method/Quality Standard, Revision #:

Toxicology AM #25, AM #26, and AM #27, Revision 13

Temporary or Permanent Deviation:

Permanent

---

**Scope of Deviation** (record specific information, e.g. affected programs, evidence types, expected end date; etc):

Deviation will remain in place until the change is made in the next method revision.

**Deviation Request** (Describe detailed instructions of the changes being made; include reference to specific section number(s) in the method manual):

Toxicology AM #25 3.3.1.1 Internal standards are prepared by the ToxBox plate manufacturer and contained on the 96 well plate. If the run contains urine samples, a positive external urine control must also be run.

Toxicology AM #26 3.3.2 A negative control will be run with each extraction. If the run contains urine samples, a negative urine control and external positive urine control must also be included.

Toxicology AM #27 3.3.2 A negative control will be run with each extraction. If the run contains urine samples, a negative urine control and positive external urine control will also be included in the run.

The deviation is to include the option of using an internal urine control in lieu of an external urine control.

**Technical Justification for Analytical Method Deviations:**

Internal controls serve the same purpose as external controls but also helps to avoid the possible issues that can occur with using external controls (incorrect spiking, incorrect preparation, evaporation of compounds, etc.). If these errors occur, runs need to be repeated and this wastes time, sample, and supplies.

**Technical Review**

---

Departure approved

Comments:

Departure Not Approved

Comments:



Approver: Rachel Cutler

Date: 3/2/22

Title: Lab Manager

**Quality Review**

---

Quality Approver: Jason Crowe

Title: Quality Manager

Date: 3/2/2022



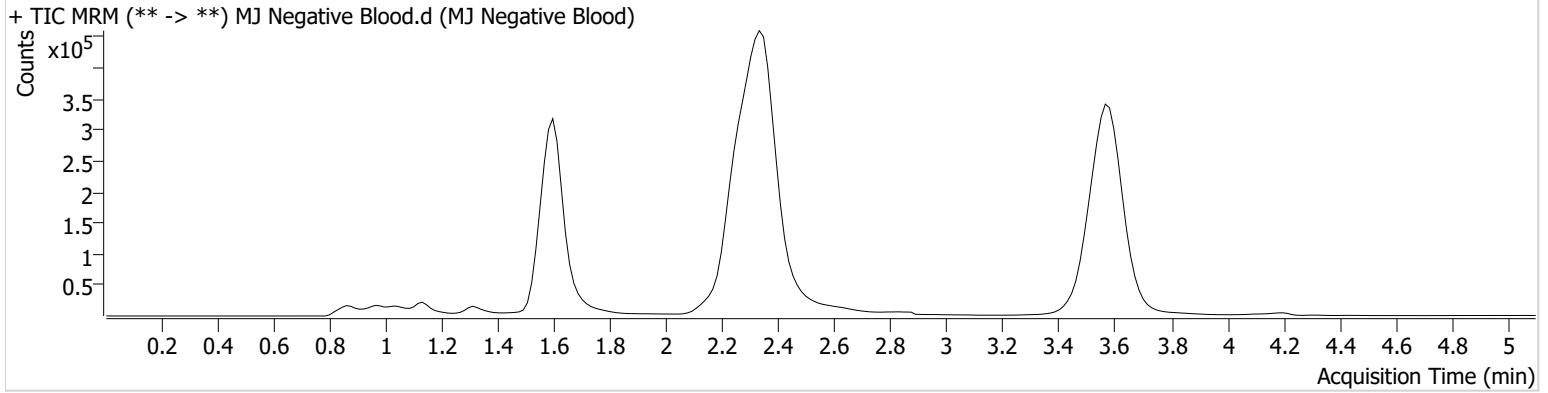


# AM #27 Cannabinoid Quant. Results

**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	MJ Negative Blood.d
<b>Type</b>	Sample	<b>Sample</b>	MJ Negative Blood
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-G5	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 4:46:58 PM		
<b>Sample Info.</b>			

## Sample Chromatogram





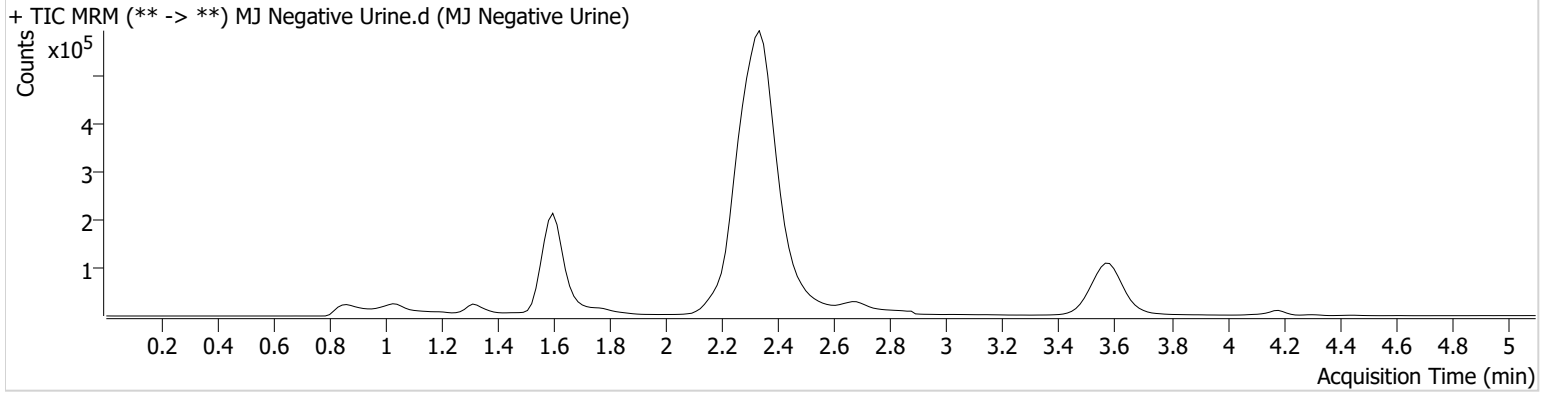
# AM #27 Cannabinoid Quant. Results



**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	MJ Negative Urine.d
<b>Type</b>	Sample	<b>Sample</b>	MJ Negative Urine
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-E5	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 5:09:48 PM		
<b>Sample Info.</b>			

## Sample Chromatogram



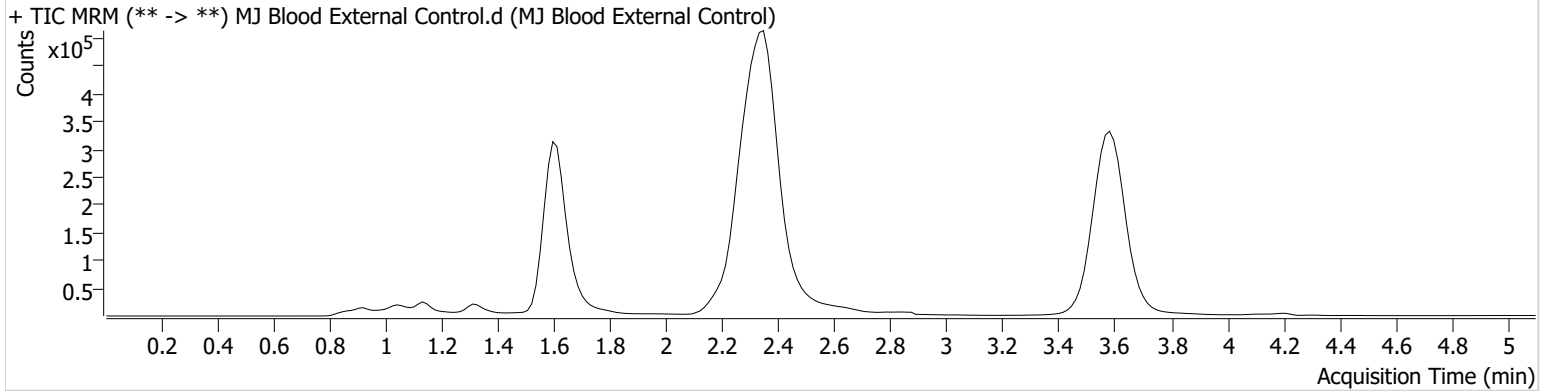
# AM #27 Cannabinoid Quant. Results



**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	MJ Blood External Control.d
<b>Type</b>	Sample	<b>Sample</b>	MJ Blood External Control
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-F5	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 4:54:34 PM		
<b>Sample Info.</b>			

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.640	116768	∞	51.1	943.24	270383	16.3717 ng/ml

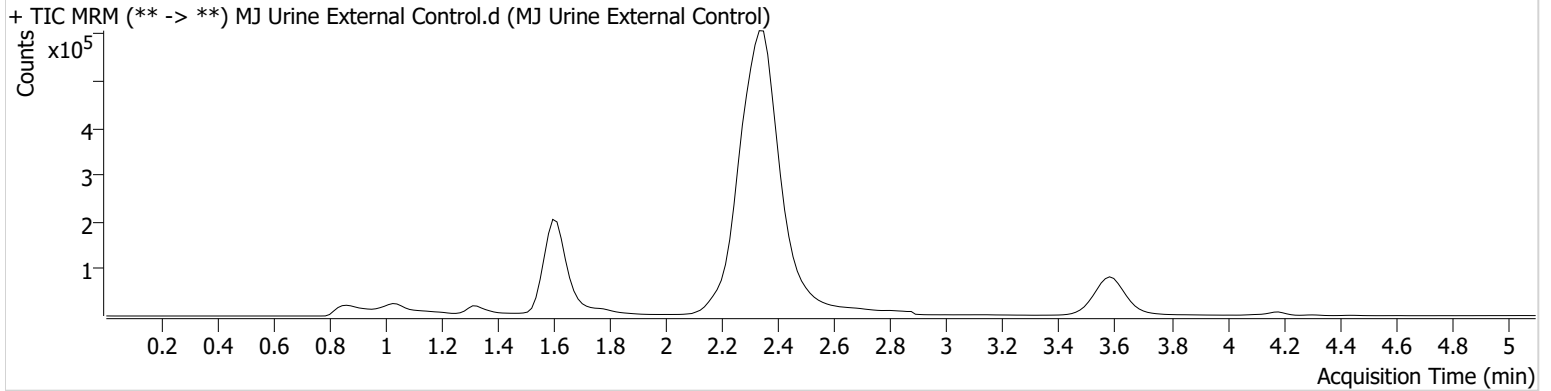
# AM #27 Cannabinoid Quant. Results



**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	MJ Urine External Control.d
<b>Type</b>	Sample	<b>Sample</b>	MJ Urine External Control
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-D5	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 5:17:23 PM		
<b>Sample Info.</b>			

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.640	64464	∞	43.0	171.98	142751	17.2755 ng/ml

# AM #27 Cannabinoid Quant. Results

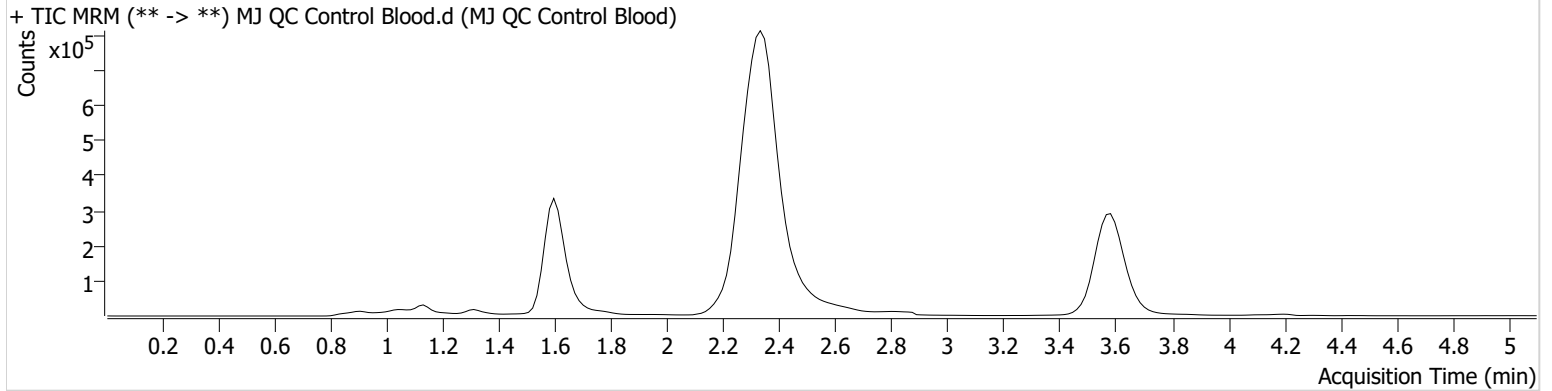


**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	MJ QC Control Blood.d
<b>Type</b>	QC	<b>Sample</b>	MJ QC Control Blood
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-A6	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 4:31:45 PM		

**Sample Info.**

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.640	104226	502.36	45.3	∞	258936	15.0269 ng/ml

CS

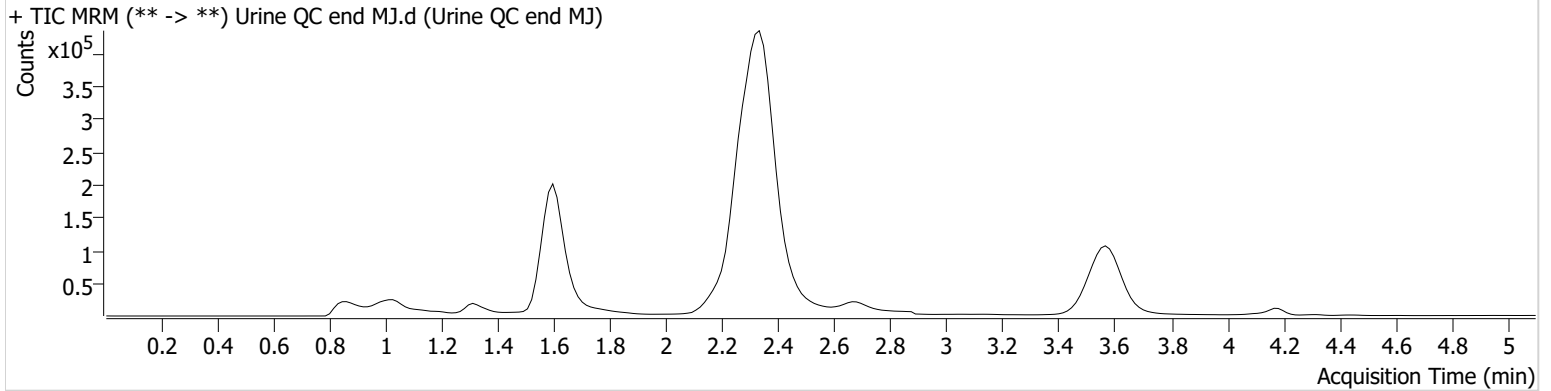


# AM #27 Cannabinoid Quant. Results

**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	Urine QC end MJ.d
<b>Type</b>	QC	<b>Sample</b>	Urine QC end MJ
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-H5	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 7:34:20 PM		
<b>Sample Info.</b>			

## Sample Chromatogram

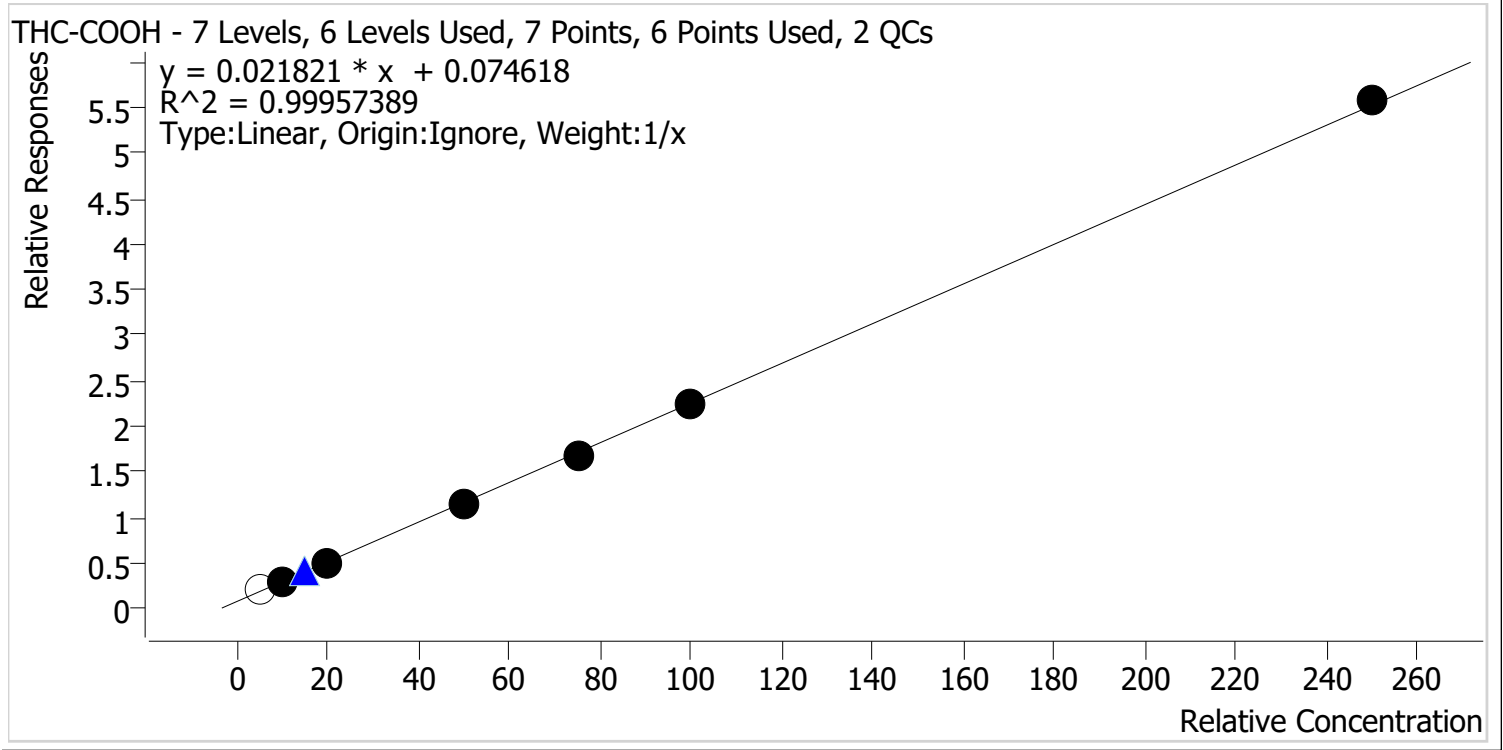


Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.625	58137	∞	50.0	282.81	147774	14.6099 ng/ml



# AM #27 Cannabinoids Quant. Calibration Curve Report

**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Last Cal. Update** 10/19/2022 1:07 PM  
**Analyst Name** ISP\datastor  
**Analyte** THC-COOH **Internal Standard** THC-COOH-D9



Sample	Level	Enabled	Expected Concentration	Final Concentration	Accuracy
Cal 1 MJ	1	x	5.0	6.3	127.0
Cal 2 MJ	2	✓	10.0	10.7	106.8
Cal 3 MJ	3	✓	20.0	19.0	95.1
Cal 4 MJ	4	✓	50.0	49.5	99.1
Cal 5 MJ	5	✓	75.0	74.0	98.7
Cal 6 MJ	6	✓	100.0	99.4	99.4
Cal 7 MJ	7	✓	250.0	252.4	100.9

CS

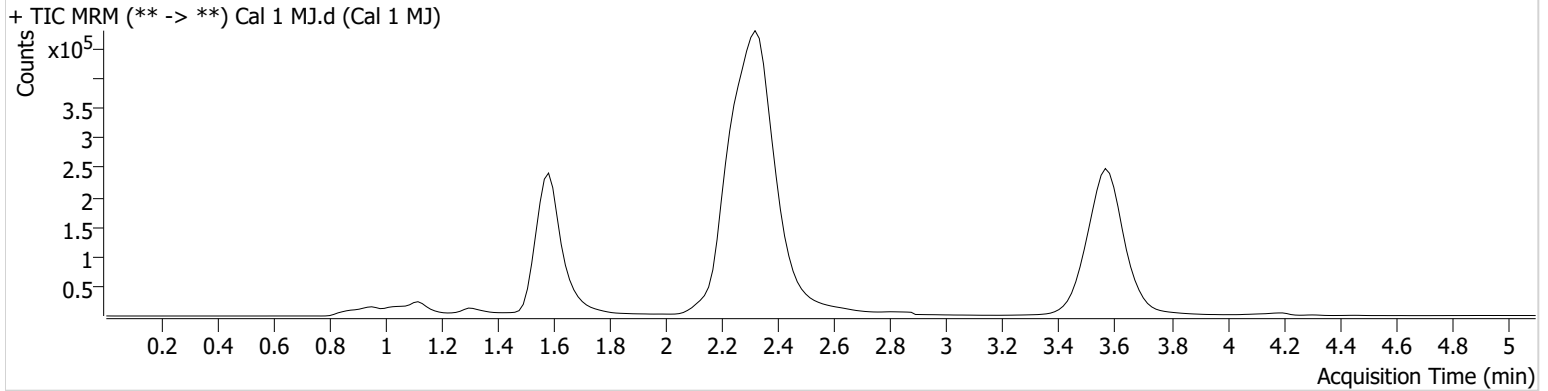


# AM #27 Cannabinoid Quant. Results

**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	Cal 1 MJ.d
<b>Type</b>	Cal	<b>Sample</b>	Cal 1 MJ
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-H6	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 3:30:44 PM		
<b>Sample Info.</b>			

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.625	50870	∞	27.6 <b>Low</b>	∞	238631	6.3497 ng/ml

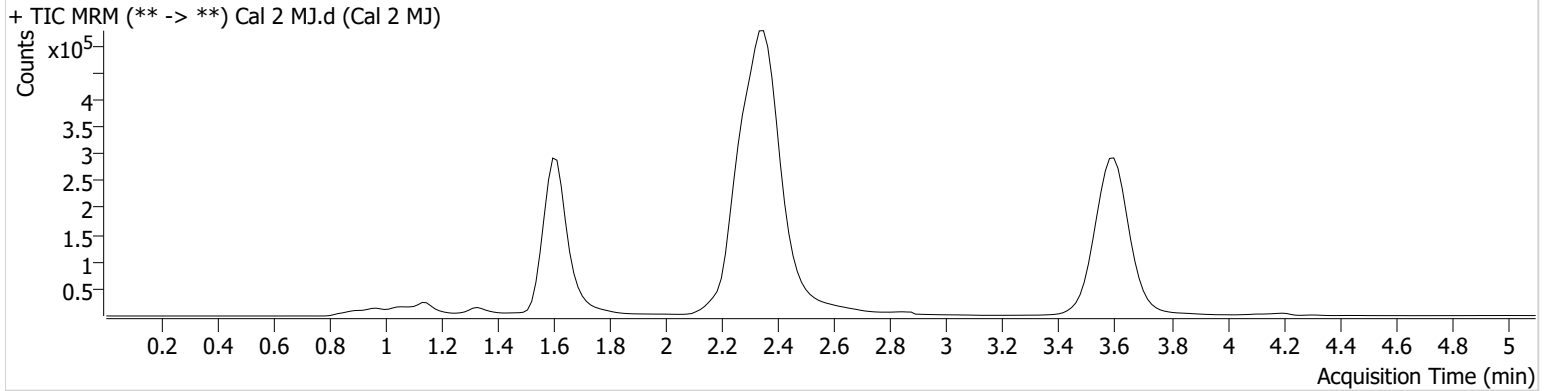
# AM #27 Cannabinoid Quant. Results



**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	Cal 2 MJ.d
<b>Type</b>	Cal	<b>Sample</b>	Cal 2 MJ
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-G6	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 3:38:30 PM		
<b>Sample Info.</b>			

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.640	79251	∞	42.5	∞	257584	10.6803 ng/ml



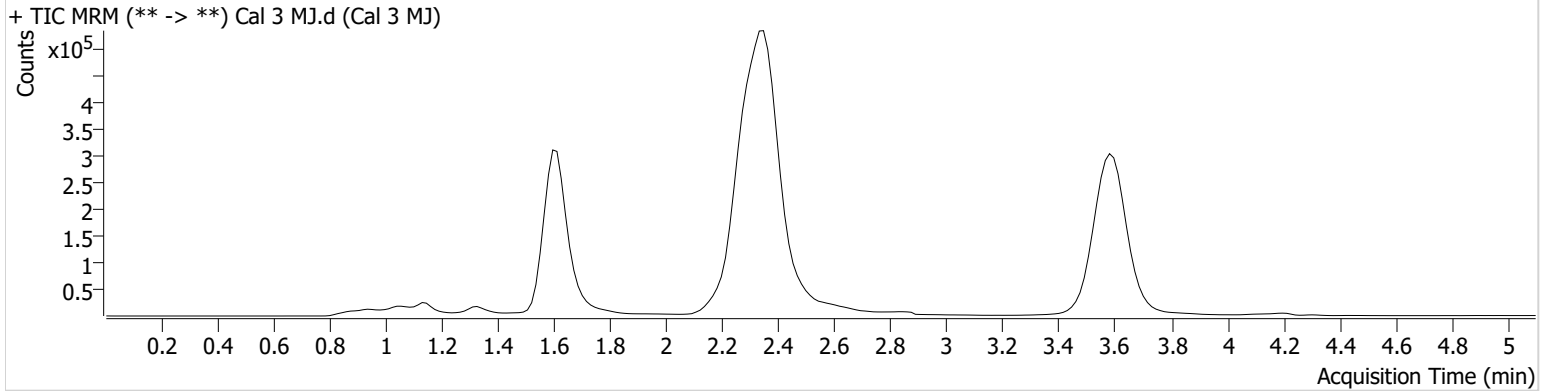
# AM #27 Cannabinoid Quant. Results



**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	Cal 3 MJ.d
<b>Type</b>	Cal	<b>Sample</b>	Cal 3 MJ
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-F6	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 3:46:06 PM		

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.640	125551	∞	50.3	∞	256345	19.0256 ng/ml

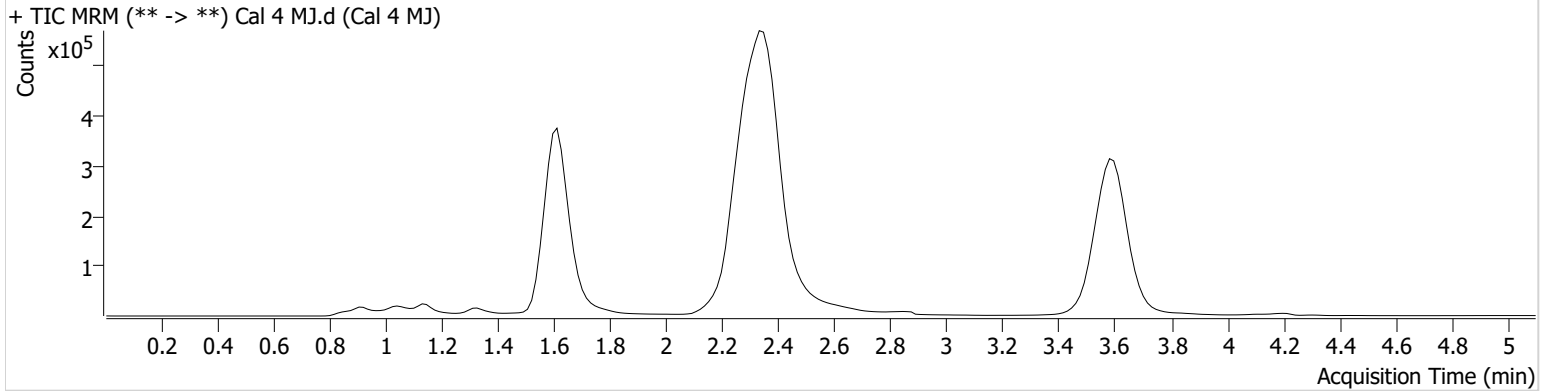


# AM #27 Cannabinoid Quant. Results

**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

**Instrument** Falco (069901) **Data File** Cal 4 MJ.d  
**Type** Cal **Sample** Cal 4 MJ  
**Acq. Method** AM 27 THCQ.m **Operator** Celena Shrum  
**Sample Position** P1-E6 **Comment**  
**Injection Volume** 10  
**Acq. Date-Time** 10/18/2022 3:53:42 PM  
**Sample Info.**

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.640	301637	∞	54.7	∞	261082	49.5267 ng/ml

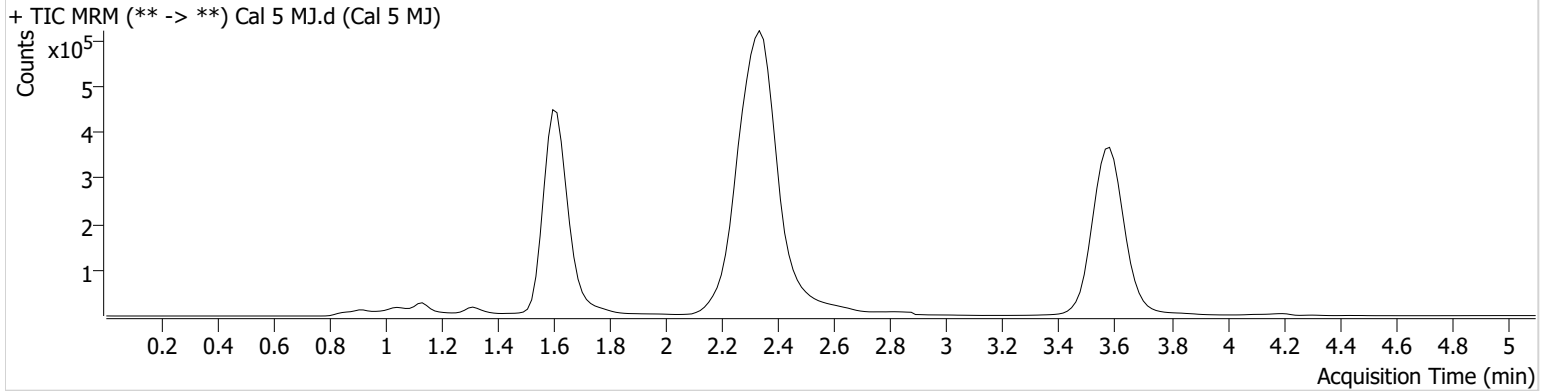


# AM #27 Cannabinoid Quant. Results

**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

**Instrument** Falco (069901) **Data File** Cal 5 MJ.d  
**Type** Cal **Sample** Cal 5 MJ  
**Acq. Method** AM 27 THCQ.m **Operator** Celena Shrum  
**Sample Position** P1-D6 **Comment**  
**Injection Volume** 10  
**Acq. Date-Time** 10/18/2022 4:01:19 PM  
**Sample Info.**

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.625	414101	∞	57.0	∞	245098	74.0077 ng/ml

CS

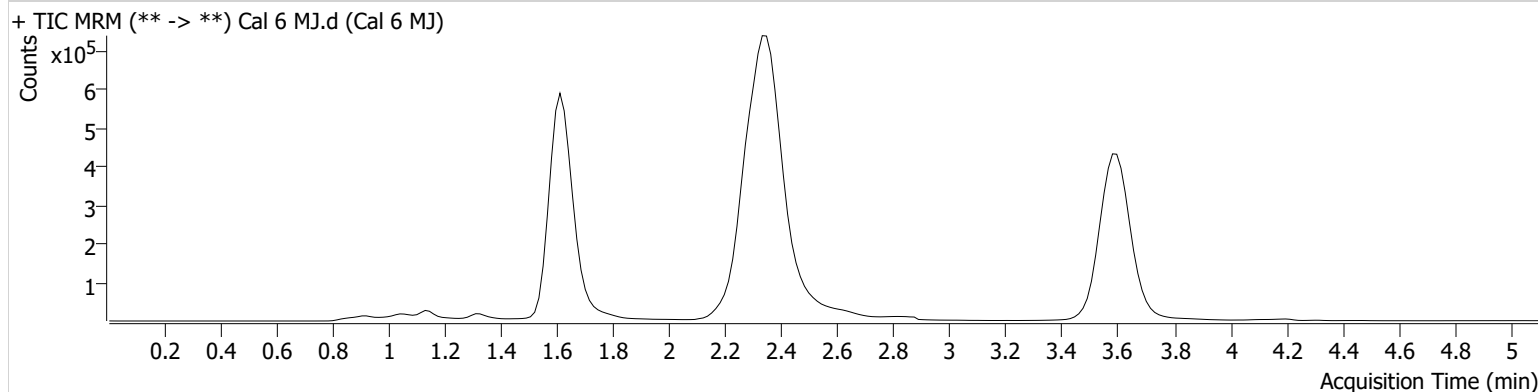


# AM #27 Cannabinoid Quant. Results

**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	Cal 6 MJ.d
<b>Type</b>	Cal	<b>Sample</b>	Cal 6 MJ
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-C6	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 4:08:55 PM		

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.640	548064	∞	57.4	∞	244297	99.3915 ng/ml

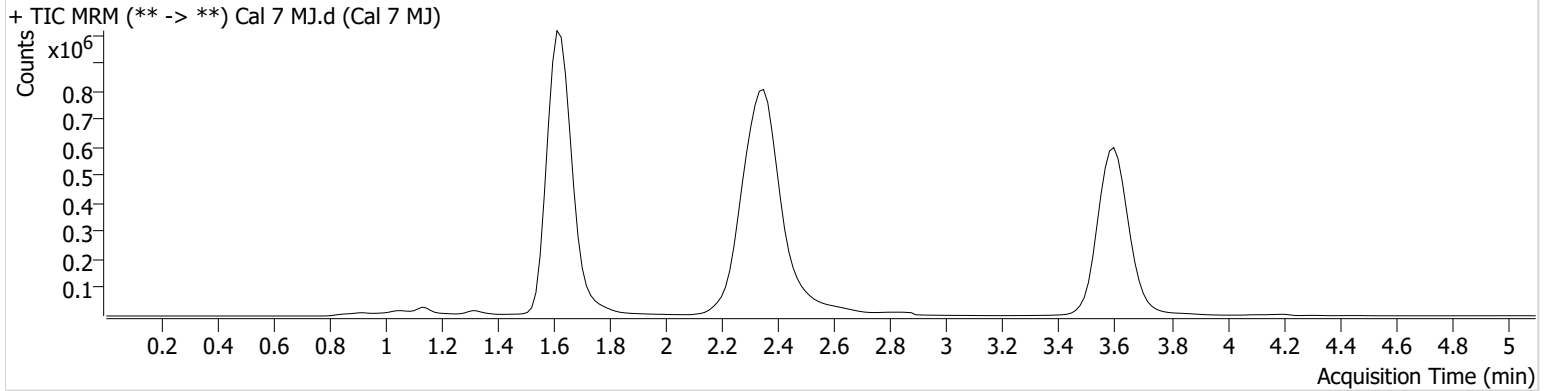
# AM #27 Cannabinoid Quant. Results



**Batch results** D:\MassHunter\Data\2022\AM 27-28\101822 AM 27 28 CS\QuantResults\AM 27.batch.bin  
**Calibration Last Update** 10/19/2022 1:07:34 PM

<b>Instrument</b>	Falco (069901)	<b>Data File</b>	Cal 7 MJ.d
<b>Type</b>	Cal	<b>Sample</b>	Cal 7 MJ
<b>Acq. Method</b>	AM 27 THCQ.m	<b>Operator</b>	Celena Shrum
<b>Sample Position</b>	P1-B6	<b>Comment</b>	
<b>Injection Volume</b>	10		
<b>Acq. Date-Time</b>	10/18/2022 4:16:31 PM		
<b>Sample Info.</b>			

## Sample Chromatogram



Name	RT	Resp.	S/N	Ratio	S/N	ISTD Resp.	Final Conc.
THC-COOH	1.640	1392212	∞	58.5	5641.57	249432	252.3683 ng/ml