

The **Scissortail Symposium Series**
Presented by Ian Cameron and STL Technical Directors

Science Communication:

Why Does Testing Cost So Much
and Take So Long?!

Ian Cameron - Laboratory Director



Ian founded Scissortail Laboratory in 2018 after SQ788 passed in Oklahoma. Previously, Ian was the National Laboratory Director for a series of cannabis testing labs on the west coast. Prior to that, he worked for nearly 25 years in the environmental testing space.

Allison Hastings-Trahan - Assistant Laboratory Director



Allison has worked in cannabis analytical testing since 2018

She earned her BS in Biology from University of Central Oklahoma and also holds an Associate's Degree in Biology from TCC

She has experience in nearly all analytical technologies and brings a focused, motivated energy to the cannabis testing industry

Anndrea Osborne - Laboratory Manager



Anndrea began working at Scissortail Laboratory in 2022. Prior to joining us, she worked in cannabis production and plant nursery environments

She earned her BS in Plant Molecular Biology from the University of Texas at Austin where she also worked as a plant genetics research assistant

Anndrea works diligently to meet regulatory requirements while exceeding client expectations

Audri Malik - Microbiology Technical Director



Audri has worked in the cannabis industry in multiple capacities since 2018

Before that, she earned her BS in Biology from the University of Oklahoma and her Associates Degree in Biology from OCCC

Her passion for elevating plant science in the cannabis industry has helped develop Scissortail Laboratory's microbiology department far beyond compliance testing

Danielle Wright-Johnson - Organics Technical Director



Danielle has worked for Scissortail Laboratory since 2019, moving up the ranks from Sample Prep Technician to Technical Director

She earned her BS in Chemistry from Langston University with hours in the Chemistry Masters Program at Oklahoma State

Danielle attended an internship at NASA in 2015 and again in 2016

Topics of Discussion

Issues in Cannabis Testing

Testing In the Cannabis Spaces vs. Other Industries

How Do We Move Forward and What The Future Holds

How To Prepare For A Changing Industry

How Do You Know - Quality Control, Precision & Accuracy

How To Interpret Your CoA

Instrumentation

Cannabis Testing Is A Juggling Act

What's The Delay?

So Why Does Testing Take So Long and Cost So Much?

Issues in Cannabis Testing

Producing quality data with these instruments is not new, they've been used in multiple industries for decades

Lack of overarching quality program has caused the issues and the distrust that we see in the cannabis testing space today

Cannabis is just as quantifiable as any other matrix



Testing in Cannabis vs. Other Industries

In comparison, in environmental testing, the EPA has published specific methodologies that all accredited environmental labs throughout the country must follow

Additionally, accreditation bodies look into how closely the laboratory's procedures follow the published methods and whether the quality control protocols are being followed before the lab publishes data



How Do We Move Forward?

With that in mind, it is up to laboratories to regain the industry's trust in analytical processes and in the validity of the data being produced

This includes confirming unexpected results **WITHOUT** charging the client

Partnering with other trusted laboratories to confirm unusual results

That said, part of this responsibility relies on the end-user understanding what quality-controlled data looks like

What The Future Holds

Across the country, states are beginning to create methodologies that cannabis laboratories have to adhere to

Here in Oklahoma, new testing standards have been released that all testing laboratories must begin following in June 2024

So what does that mean for the end user?



How To Prepare For A Changing Industry

These symposiums are designed to help laboratories ensure their procedures are compliant with these increasing standards

And to help the end user tailor their processes to these standards

It's important for everyone in the industry to have an understanding of what "good" data looks like and what to expect to help us all legitimize our industry

How Do You Know - Quality Control

When producing scientific data, there are two things laboratories are trying to achieve:

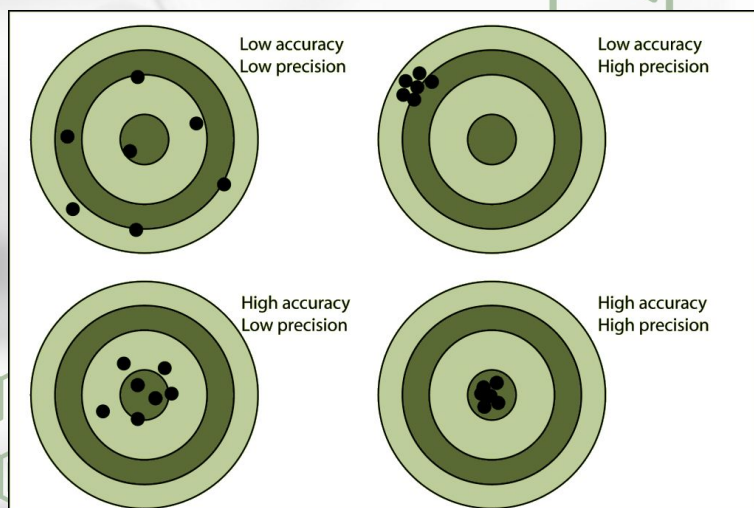
Accuracy - Can we quantify the amount that is in the sample?

Precision - Can we reproduce that value consistently?

To evaluate these questions, labs run quality control samples

If you question your testing results, review the QC package

Precision vs. Accuracy



Quality Control Types

QC Type	Purpose	Determines
Calibration Verification	CCVs ensure the instrument calibration is still appropriate	Accuracy Precision
Sample Duplicate	Dups ensure the sample result is reproducible	Precision
Spikes	Spikes ensure the process can recover the actual amount in the sample	Accuracy
Blanks	Blanks ensure there is no contamination within the process	Cleanliness

Sample Duplicates

Duplicates are two aliquots pulled from the SAME sample, not two separate samples

Unfortunately, there is no analytical significance between the results of two separate samples

Similar results between two samples of the same batch is an indicator of a well-homogenized batch, but nothing else



How To Interpret Your CoA

Are we discussing data in the same units:

ppm vs ppb

mg/unit vs mg/gram for edibles

Percent vs mg per weight

Unit weight for edibles will change the potency

What is the reported LOQ for each compound

Action Limit is the value over which a compound is deemed unsafe

Do CoAs have an expiration date?

Certificate of Analysis
Sample: 2010SL0006.0013
SIC Industries
Girl Scout Cookies
Batch: 2010SL0006
Report Created: 10/10/2020

Cannabinoids		Terpenes	
Compound	Amount	Compound	Amount
THC	24.88%	Myrcene	0.11%
THC-A	0.00%	Pinene	0.05%
THC-O	0.00%	Terpinolene	0.02%
THC-V	0.00%	Limonene	0.01%
THC-D	0.00%	Humulene	0.01%
THC-E	0.00%	Valerene	0.01%
THC-F	0.00%	Terpene	0.01%
THC-G	0.00%	Terpene	0.01%
THC-H	0.00%	Terpene	0.01%
THC-I	0.00%	Terpene	0.01%
THC-J	0.00%	Terpene	0.01%
THC-K	0.00%	Terpene	0.01%
THC-L	0.00%	Terpene	0.01%
THC-M	0.00%	Terpene	0.01%
THC-N	0.00%	Terpene	0.01%
THC-O	0.00%	Terpene	0.01%
THC-P	0.00%	Terpene	0.01%
THC-Q	0.00%	Terpene	0.01%
THC-R	0.00%	Terpene	0.01%
THC-S	0.00%	Terpene	0.01%
THC-T	0.00%	Terpene	0.01%
THC-U	0.00%	Terpene	0.01%
THC-V	0.00%	Terpene	0.01%
THC-W	0.00%	Terpene	0.01%
THC-X	0.00%	Terpene	0.01%
THC-Y	0.00%	Terpene	0.01%
THC-Z	0.00%	Terpene	0.01%

Cannabis Testing Is A Juggling Act

As we move forward as an industry, it's important for all involved to understand expectations in good analytical testing

First and foremost, laboratories are determining patient safety

But simultaneously, they're working to cut costs and keep turn around times competitive

A standard Turn Around Time assumes that everything works perfectly, but...

Ok, But What's The Delay?

Often times, everything doesn't work perfectly

Unexpected results require reanalysis or even reprep before reanalysis

QC Failures are common and require reanalysis of the entire batch of 24 samples

Every lab has QC failures - how the lab handles failures is what's important

Runtimes are limiting - 30 minutes for one sample to run on a GC/MS

A QC failure on a GC/MS means a half a day's runtime lost

Producing Analytical Data Is Expensive

Laboratories must have a minimum of eight expensive instruments to run a full suite of tests

Instruments aren't "plug-and-play" and require skilled, educated analysts

The consumables required to prepare and analyze samples are expensive

Instrumentation - Chemical Analysis

HPLC - High Performance Liquid Chromatograph

Potency

LC/MS/MS - Liquid Chromatograph Mass Spectrometry

Pesticides

GC/MS - Gas Chromatograph Mass Spectrometry

Terpenes

GC/FID - Gas Chromatograph Flame Ionization Detector

Residual Solvents

ICP/MS - Inductively Coupled Plasma Mass Spectrometry

Heavy Metals

Instrumentation - Microbial Detection and Moisture

Polymerase Chain Reaction (PCR)

Detects the actual DNA of the organisms of interest

Plating

Provides favorable conditions for the organisms of interest to grow

ELISA - Enzyme-Linked Immunoassay

Technique used to detect mycotoxins

Water Activity Meter

Determines the samples potential to mold

Moisture Balance

Calculates the amount of water in a sample

So Why Does Testing Take So Long and Cost So Much?

Instrumentation and analyst skill required to produce analytical data are expensive

Faster TAT = More Sensitive Instruments + More Skilled Analysts

Cheaper Cost = Less Sensitive Instruments + Less Skilled Analysts

Unfortunately, what happens in the industry is laboratories try to achieve both, and end up losing the quality of their data.

Our next Symposium is December 12th

Same place, same time!

Sampling:

The Importance of a Homogenized Batch and Random Sampling