



LightLab3  
by Orange Photonics

## In-house Data Drives Quality and Cost Savings

*Develop and produce products with  
confidence and accuracy*



# Kitchen Operations: LightLab allows for independence and profitability

With access to in-house testing, your kitchen and formulate product operation will reach new operational heights and cost savings, while improving quality.

## SAVE TIME

12 minutes v. 3+ days

Reduce time required for submissions

Test any time

Be nimble

## SAVE TESTING COSTS

Limit per-test cost

Reduce man-hours associated with testing submissions

Only send final release tests through costly labs

\$4/test v. \$100/sample

## PREVENT MISTAKES

Verify COA before formulation

Check all stored ingredients for potential mixups

Ensure Lab Accuracy

Do real Quality Assurance

## DEVELOP NEW PRODUCTS FASTER

Test anything with cannabinoids, no limits to new products

Operational flexibility

Test everything

Discover and proliferate novel Cannabinoids

# Measure Active Raw Materials

- Don't assume potency or trust accuracy of CoA, develop internal process based on internal numbers
  - Distillate and oil can vary widely in concentration
    - Prior to formulation, confirm the potency and homogeneity of your raw materials!
    - Prevent misdosing and need to reformulate
    - If distilling/extracting in-house, start with the biomass; material input profile dramatically affects process outcome
  - Prevent downstream losses of time, product availability, and money
    - Test potency of 20 analytes in 15 minutes versus 3+ days or more
    - There is little to no internal R&D paperwork versus burdensome Metrc tracking for sampling to external laboratory

# Prevent Out-of-Specification Events

- Know you're in spec before you even go to mold or fill a can
  - Test preformulations and sample runs first for final confirmations
    - Ensure that accidental mixups or raw material degradation doesn't affect expensive mass runs
    - Speed up batch time or increase annual turns based on in-process data and risk assessments, vastly increase profitability.
  - Eliminate costly quarantining for OOS
    - \$\$\$ of Time
    - \$\$\$ of Labor
    - \$\$\$ of Product
    - Limited number of product reworks possible

# Develop New Products with Flexibility

- Give your kitchen operation the tool it needs to create exciting recipes and test potency in-house
  - Be Flexible and Knowledgeable
    - Every product change (flavors, ingredients, process) affects quality and potency
    - Develop and improve process without ongoing lab testing
      - Release/wholesale only requires FINAL BATCH to be tested via 3<sup>rd</sup> party
  - Test gummies, chocolates, hard candies, mints, beverages, concentrated beverage enhancers, baked goods, sublingual strips, taffy, concentrates, nanoemulsifications, distillate, and all of your in-process products.

# Future-Ready your Quality Organization

- Batch testing of raw material and finished goods is standard protocol in other industries
- LightLab is GMP/GLP compliant and provides excellent framework for low-cost, easy-to-implement GMP programs
  - Develop QA/QC protocols easier than you think with built-in workflows and SOPs
  - Quality programs save money, catch mistakes
- Prepare for future International cGMP manufacture and sales
  - Quality programs, SOPs, historic data sets and current traceability are all important aspects of cGMP programs
  - Start building out working process and internal testing strategies that will aid longterm sales strategies

# EXAMPLE 1: Less TAT = More Runs

- Lab Turn Around Time limits profitability
  - How many batches would you run per year with faster testing?
    - Formulate, produce, and package without constraint
    - Transition all raw material testing to internal on LightLab
  - Release-at-Risk programs can be set up with internal quality testing in place



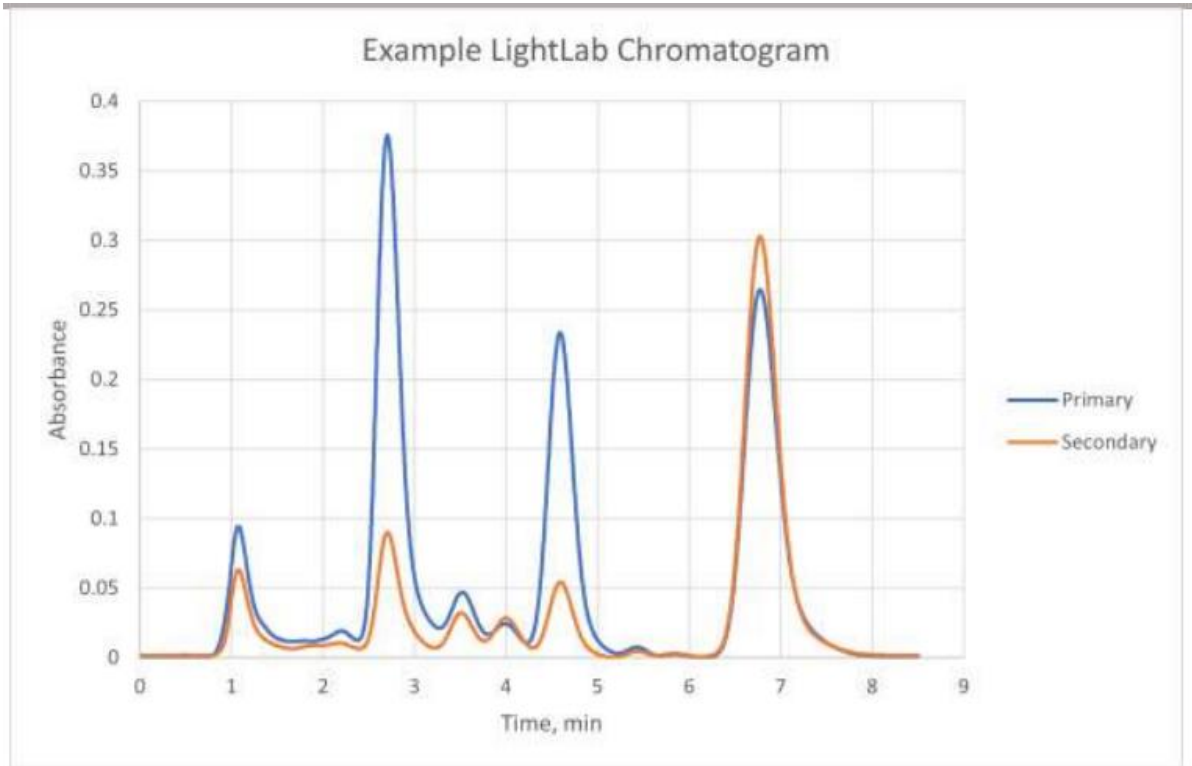
# EXAMPLE 2: Prevent Costly OOS Situations

- Ensure batches are consistently formulated prior to sending for outside lab testing
  - What is the cost of quarantine time?
    - Product not on shelves
    - Product holding up operations
  - Reformulation costs are prohibitive

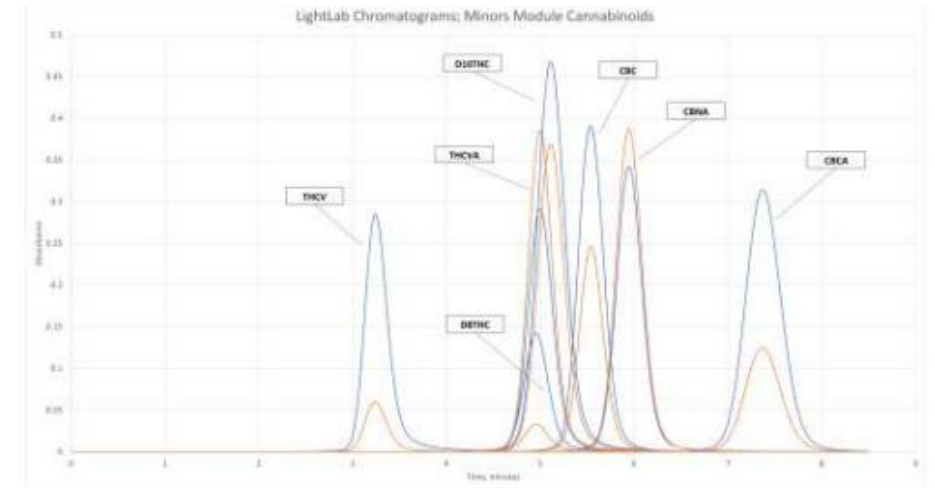
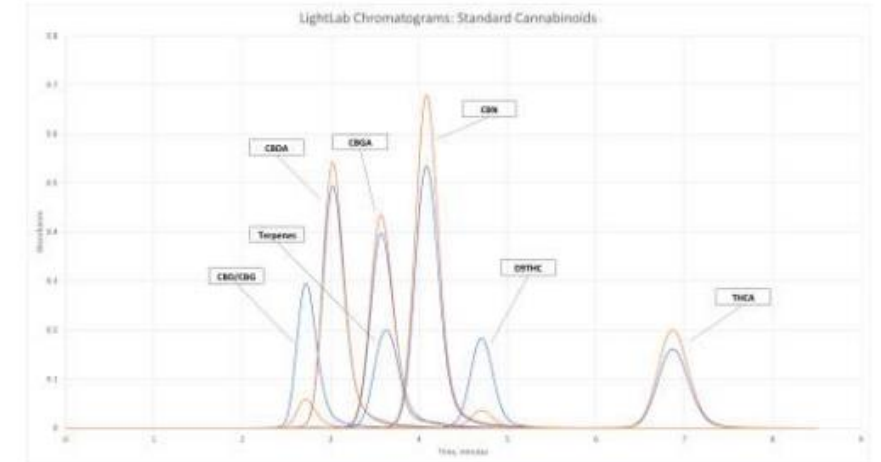




# HPLC is the Gold Standard for Cannabinoid Potency



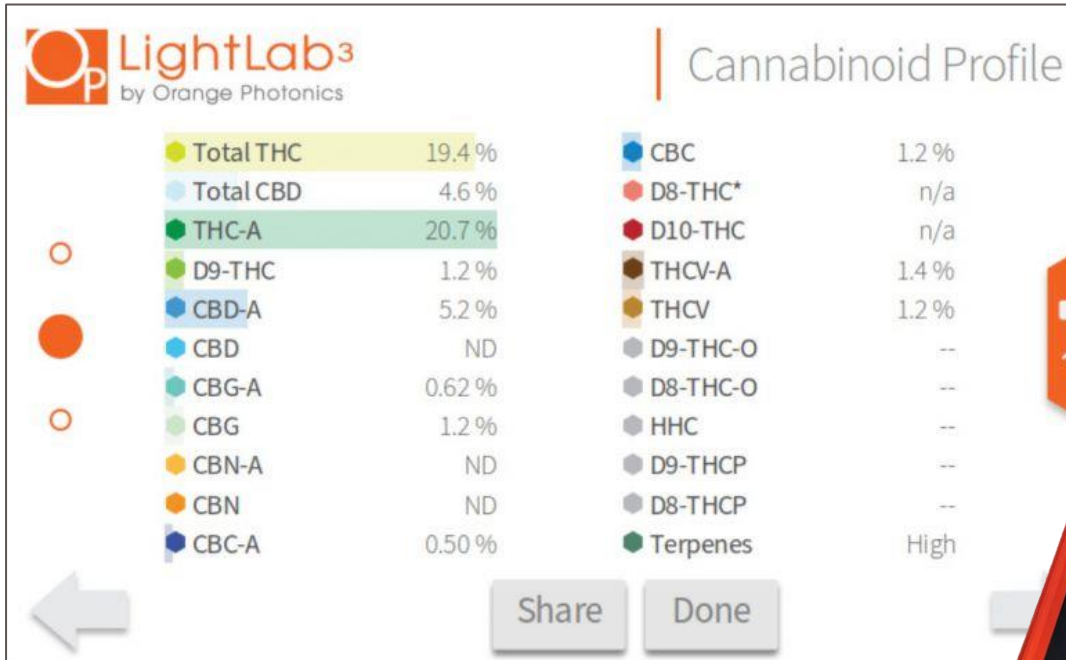
- HPLC is High Performance Liquid Chromatography
- It's *specific*, works well for cannabinoid molecules, is stable, and a very common analytical technique.



# LightLab is Fit-for-Purpose Cannabis Analysis

- Fast, traceable, accurate determination of 19+ Cannabinoid Profile Potency in over 20 different sample forms
- Fit-for-purpose HPLC for the non-scientific user
  - Technology is analogous to the benchtop standards
- Proprietary Reverse-Phase Column Material and Design
  - Uniquely engineered to allow for non-diluted samples
- Multiple Linear Regression analysis used in a proprietary algorithm, like a chemist in the box
- Annual Calibration with certified Cayman Reference Standards
- SOPs, User Training and Support Workshops
- Simple touchscreen operation
- WiFi-based Reachback file support available





**LightLab<sup>3</sup> by Orange Photonics**

### Cannabinoid Profile

Total THC	19.4 %	CBC	1.2 %
Total CBD	4.6 %	D8-THC*	n/a
THC-A	20.7 %	D10-THC	n/a
D9-THC	1.2 %	THCV-A	1.4 %
CBD-A	5.2 %	THCV	1.2 %
CBD	ND	D9-THC-O	--
CBG-A	0.62 %	D8-THC-O	--
CBG	1.2 %	HHC	--
CBN-A	ND	D9-THCP	--
CBN	ND	D8-THCP	--
CBC-A	0.50 %	Terpenes	High

Share Done




**LightLab<sup>3</sup> HS**  
High Sensitivity Cannabis Analyzer

**Certificate of Analysis**

Date: 2023-01-31T10:11:16  
 LightLab: Jill's HS  
 Serial: LL030466  
 Operator: KMBK  
 Sample ID: KMBK  
 2022

Method: LightLab HPLC  
 Test Type: Hemp Compliance  
 Moisture: 0.0%  
 Weight / Volume: 0.504 g  
 Solvent: 20 ml  
 Temperature: 24.6 °C  
 Cultivar: Painted Lady  
 Cal Expiration: 2024-01-04T03:09:42

### Cannabinoid Profile

	%	LOQ
Total THC	0.20%	0.050
THC-A	ND	0.050
D9-THC	n/a	--
CBD-A	n/a	--
CBD	n/a	--
CBG-A	n/a	--
CBG	n/a	--
CBN-A	n/a	--
CBN	n/a	--
CBC-A	n/a	--
CBC	n/a	--
D8-THC*	n/a	--
D10-THC	n/a	--
THCV-A	n/a	--
THCV	n/a	--
D9-THC-O	n/a	--
D8-THC-O	n/a	--
HHC	n/a	--
D9-THCP	n/a	--
D8-THCP	n/a	--
Terpenes	n/a	--
THC	0.17%	--
CBD	n/a	--

ND: n/a = Not Analyzed; LOQ = Limit of Quantification;  
 Total THC = (THC-A) + (D9-THC); Total CBD = (0.877 x CBD-A) + CBD.  
 Precision and higher detection limit than other cannabinoids



Approved \_\_\_\_\_ Date \_\_\_\_\_



Scan for Authenticity

LightLab Delivers Valuable Insight, Any Time or Place