

Cannabis Breathalyzer System



Client

Hound Labs

Practice Areas

TechBio & Life Sciences

Core Disciplines

Software Engineering
Mechanical Engineering
Systems Engineering
Transfer to Manufacture
Electrical Engineering
Optical Science
Quality System Management
Embedded Systems
Microfluidics

Challenge

Hound Labs needed to detect Δ -9 THC in exhaled breath with clinical-grade sensitivity – in a portable, field-ready device suitable for law enforcement and workplace environments. Beyond the engineering challenges, the project required rigorous scientific validation of THC pharmacodynamics in breath, including peer-reviewed evidence supporting detection feasibility.

Solution

Triple Ring assembled multidisciplinary development teams to design and validate a fully integrated breath analysis platform from early concept through functioning prototype. The system combined portable breath capture hardware with microfluidic lab-on-a-chip cartridges and biological sensing technologies. Validation studies were executed in parallel to generate peer-reviewed scientific evidence supporting the detection approach, with flexible R&D resourcing deployed across the full concept-to-validation arc.

Client Impact

- Delivered fully functioning prototype systems including breath capture device, control station, and microfluidic cartridges
- Produced clinical-grade THC detection data at the point of use in field conditions
- Generated peer-reviewed scientific evidence validating breath-based THC detection feasibility
- Established the technical and scientific foundation for a first-in-class cannabis breathalyzer platform

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