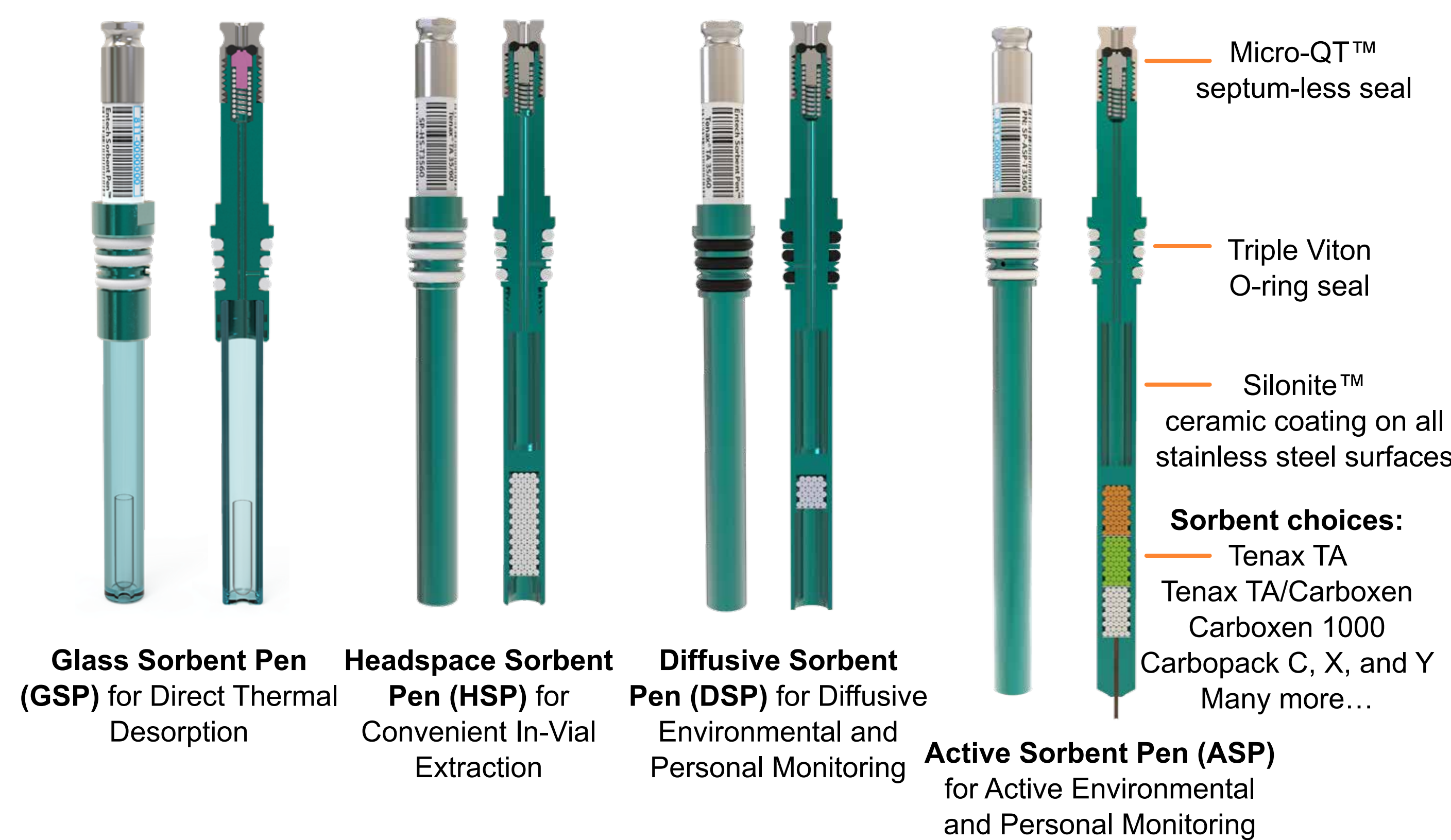


Overview



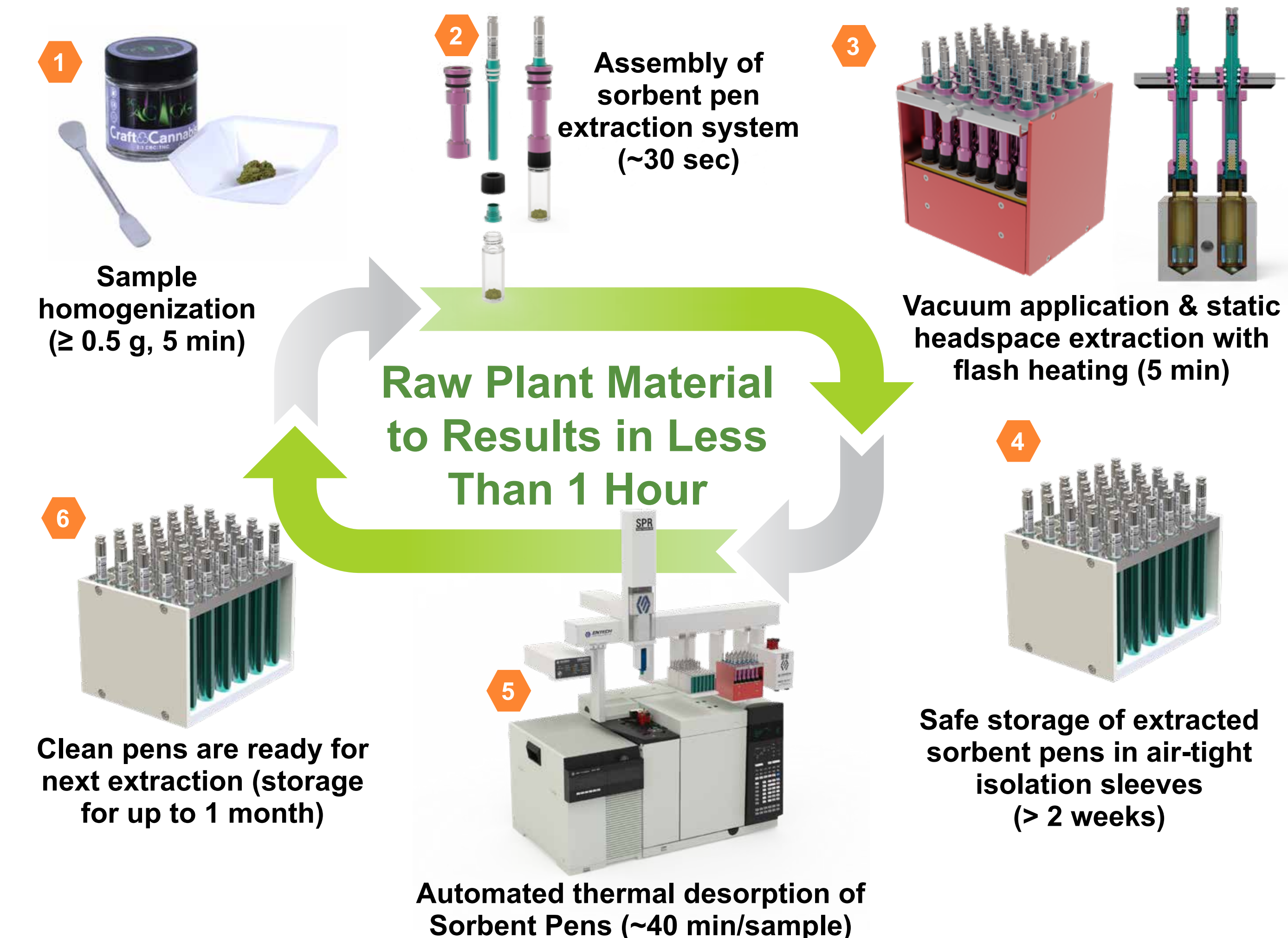
- The specific **chemical composition of cannabis** is responsible for the fragrance and flavor of the product, the experience of a recreational high, and the medicinal benefit.
- In a phenomenon known as the “**entourage effect**”, evidence further suggests that compounds act synergistically to produce desirable pharmacological effects (Russo, 2011).
- Here we describe the application of a solvent-free headspace extraction approach – **vacuum assisted sorbent extraction (VASE)** – in combination with thermal desorption GC-MS to study the makeup of cannabis flower.
- Using this approach, we obtain chemical profiles for cannabinoids and terpenes with extraction times of less than 10 minutes and a **total cycle time (raw plant material to results) of less than 1 hour**.
- Our findings reveal the unique **cannabinoid and terpene** compositions of different cannabis strains and demonstrate the potential of VASE for cannabis analysis.

Sorbent Pen™ Technology



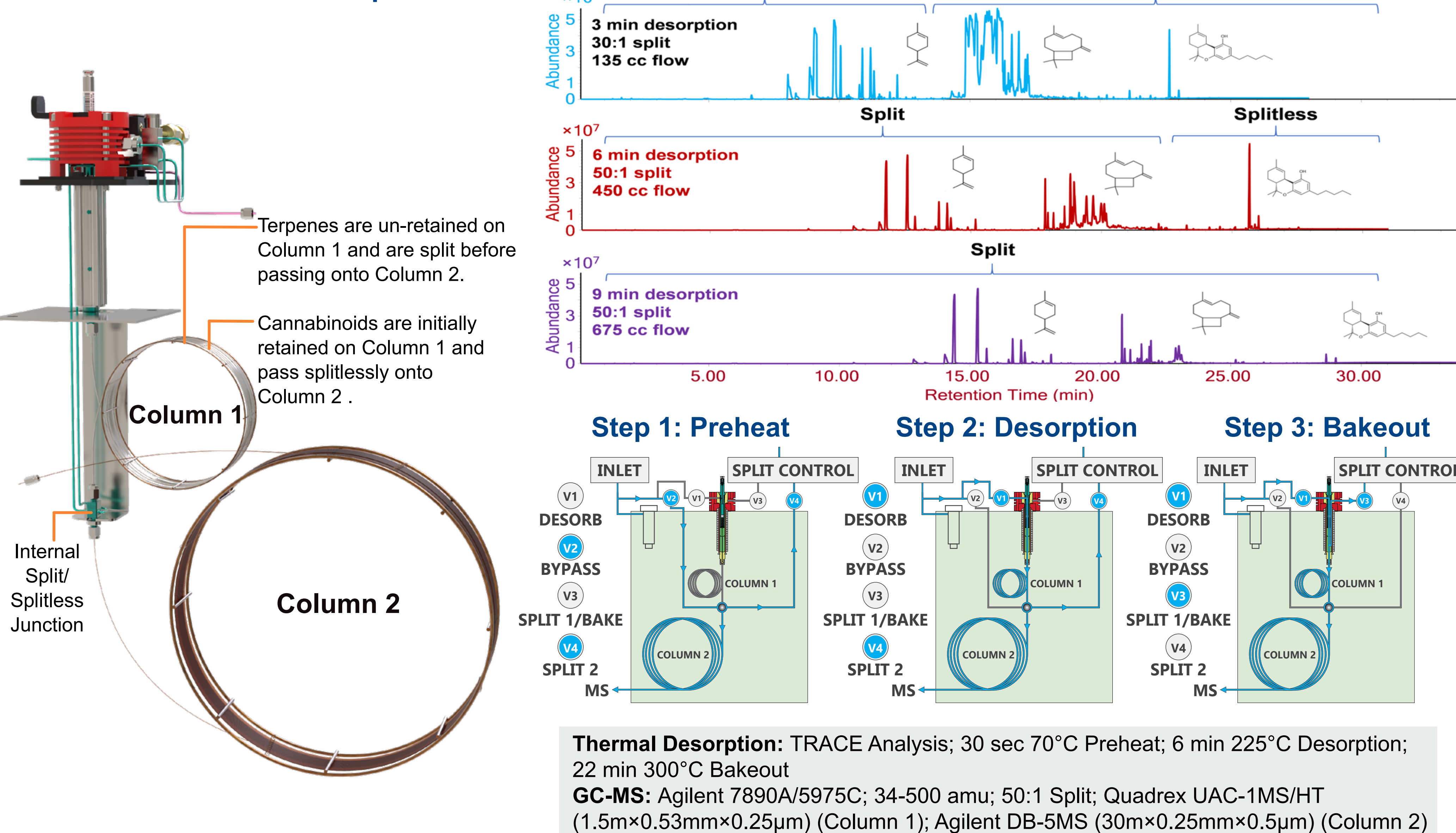
Sorbent Pen (SP) schematic, showing the Micro-QT vacuum seal and the internal sorbent bed. The SPs come in four different configurations and can be packed with a variety of sorbents, including multi-component beds of varying physical properties.

Vacuum Assisted Sorbent Extraction (VASE)



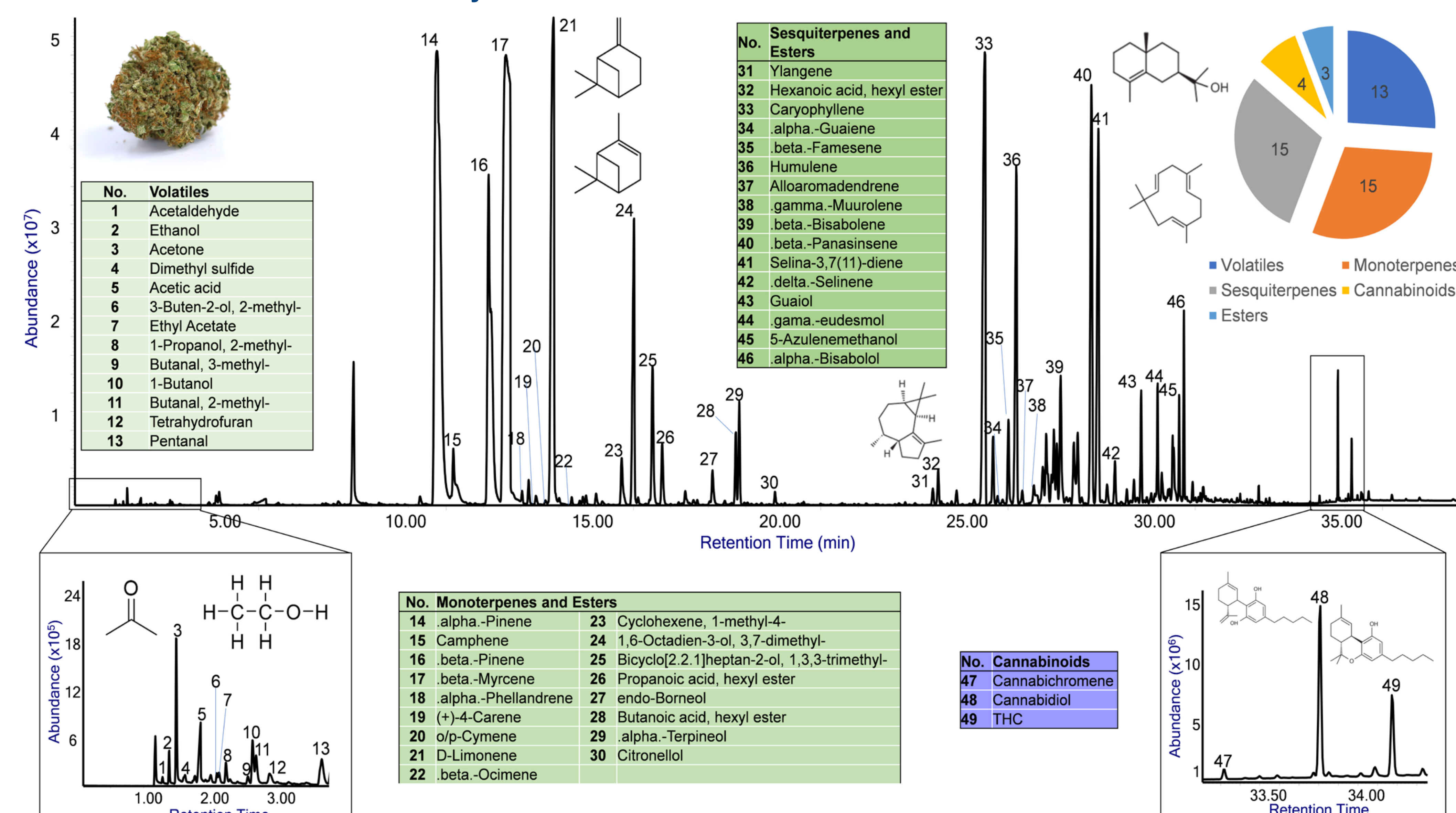
A Unique Thermal Desorption Setup for Simultaneous Cannabinoid & Terpene Analysis

Sorbent Pen Thermal Desorption Unit

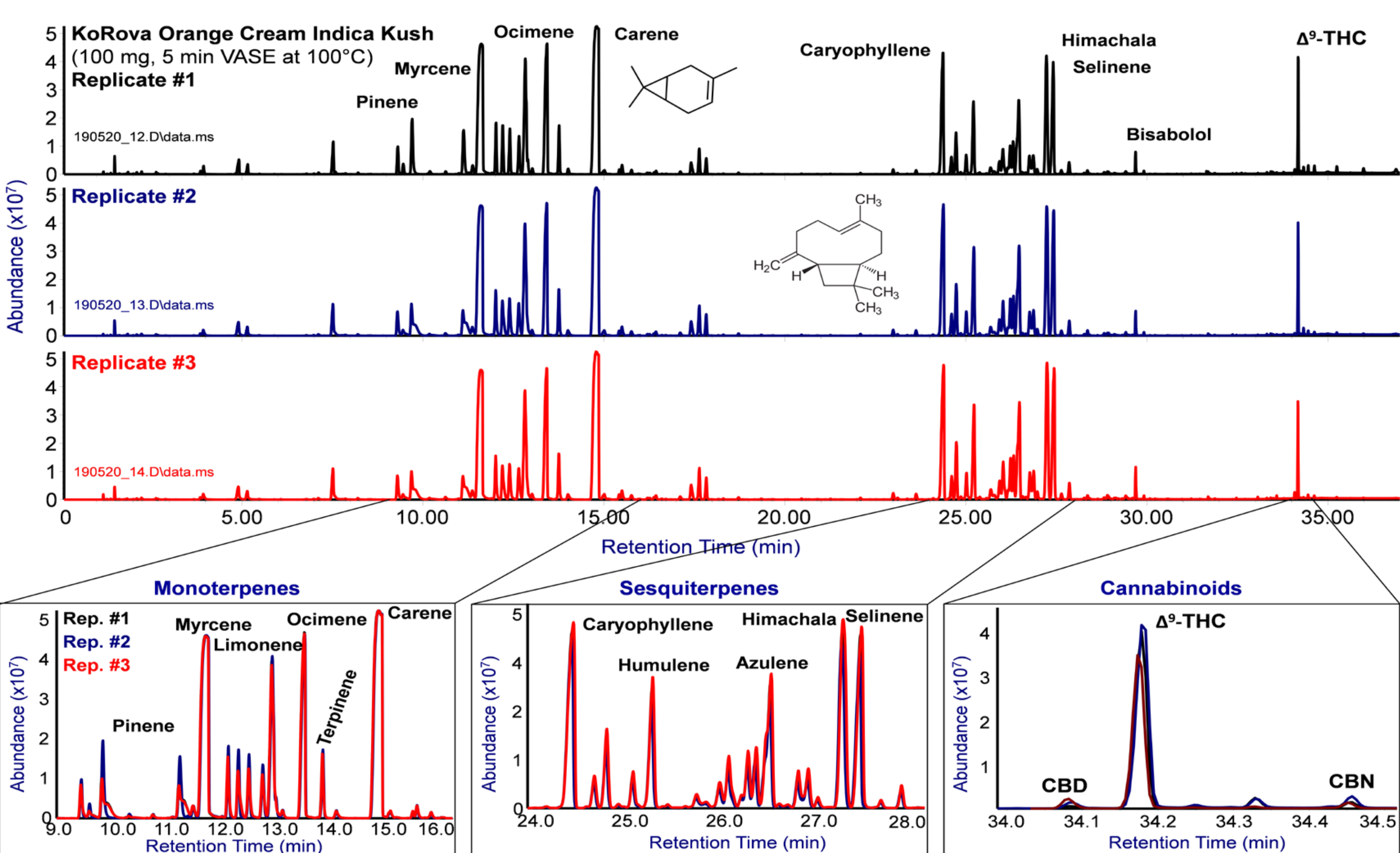


Full Terpene and Cannabinoid Profile in a Single GC-MS Run

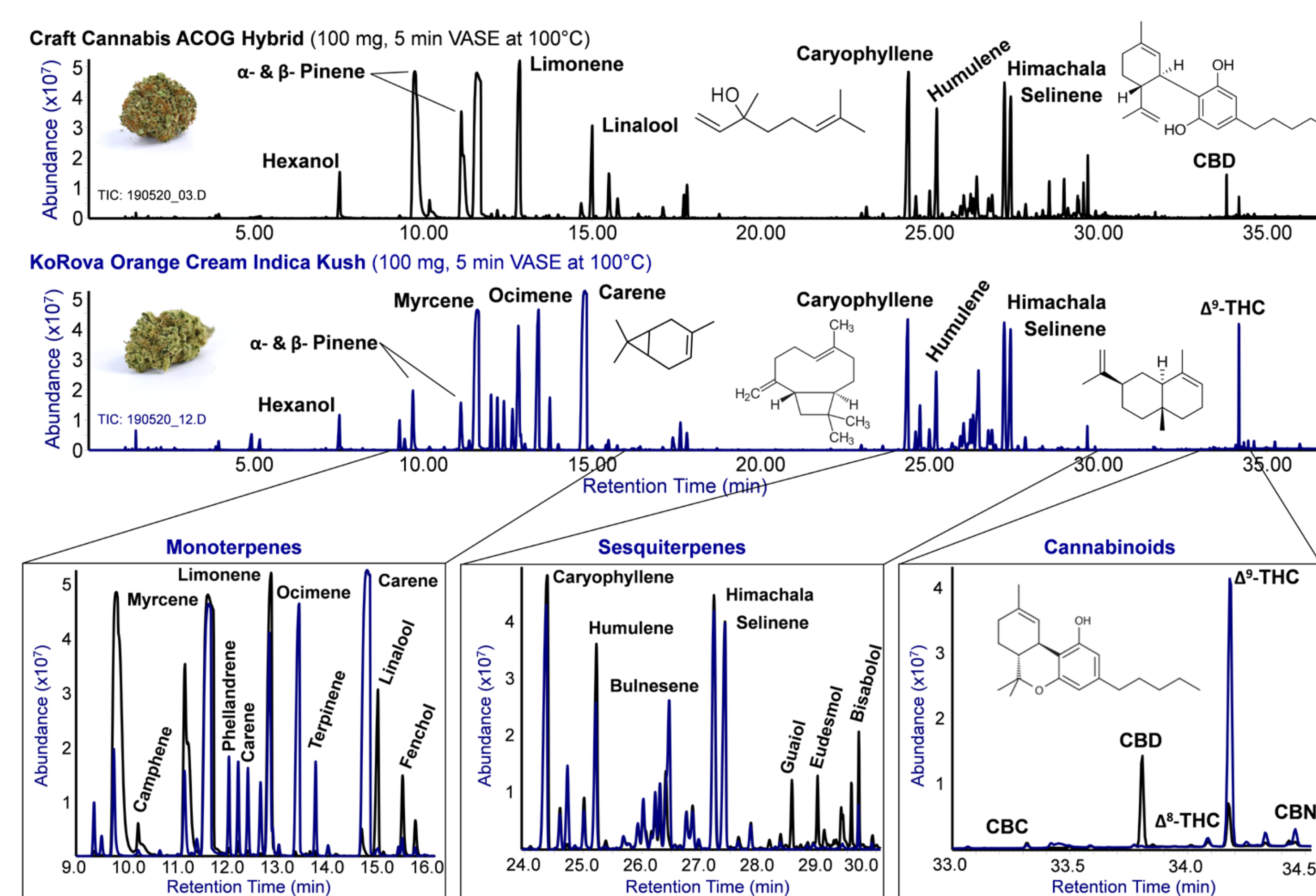
VASE-TD-GC-MS of Craft ACOG Hybrid



Reproducibility



Cannabinoid & Terpene Chemotyping



Conclusions

- Vacuum assisted sorbent extraction (VASE) is used in conjunction with a unique dual-column thermal desorption GC-MS approach to profile the cannabinoid and terpene composition of cannabis flower.
- In a single extraction lasting less than 10 minutes and a cycle time (raw plant material to results) of less than 1 hour, monoterpenes, sesquiterpenes, and cannabinoids are all easily observable.
- The method is shown to be reproducible and reliable, opening up the possibility for both quantitative analysis and qualitative profiling.

References

Russo, E. B. (2011). Taming THC: potential cannabis synergy and phytocannabinoid-terpenoid entourage effects. *British journal of pharmacology*, 163(7), 1344-1364. doi:10.1111/j.1476-5381.2011.01238.x

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