

# THE EMERALD CONFERENCE

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## **An Evaluation of Growing Environment on the Production of Secondary Metabolites in Cannabis Plants**

**Speaker: Scott Churchill, VP of Scientific Development, MCR Labs**

**Abstract:** Our team set out to determine the effect, if any, of growing conditions on clones of the same cannabis plant. In particular, we were interested in the difference between plants grown outdoors in a highly dynamic environment and those grown indoors in a tightly controlled environment. Four strains of cannabis with clones were split between indoor and outdoor growing conditions) The dried cured flowers were analyzed by LCUV, GCFID, and ICPMS to measure specific terpene, cannabinoid, and heavy metals content. These flower samples were also analyzed using a QTOF. The QTOF data was processed using principal component analysis software which was able to identify component trends distinguishing between indoor and outdoor grows as well as strain specific component trends. Outdoor grows showed a bias towards producing more complicated secondary metabolites such as Apigenin, Vetxin, and Orientin while indoor showed a bias towards simpler species such as Linalool, Terineol, and Borneol. In all cases terpene potencies were elevated in outdoor grown plants. We also found that THCa potencies were elevated in most outdoor grown plants. The only plants with measurable heavy metal content were the indoor grown plants. These results could have implications for cultivating cannabis for novel therapeutic components as well as the approach to cultivation relative to the safety and quality of the plant.