



**Assurance de la qualité et
contrôle de la qualité pour
la production de cannabis,
ses produits, et la formation**



**Quality Assurance and
Quality Control for Cannabis**
Production, Products and Training

Areas of Expertise and Proposed QAQC-Driven Research 2020-2021

CULTIVATION

Area of expertise	Description
Energy-efficient plant production	-LEDs vs HPS -Effect of light quality, quantity and timing on plant growth, development, and secondary compound accumulation -Understanding how wavelengths interact with other environmental factors (temperature, humidity, watering, nutrients, etc.) -Industrial design of growth chambers targeted at optimizing yield for specific applications
Plant development	-Effects of light on tissue and organ development -Understanding trichome development and the development of mesophyll (photosynthetic tissue of the leaf) using high- end microscopy and biochemical analyses
Temperature and light stress	-Cold stress and photosynthesis in cannabis -Understanding how cannabis plant controls temperature and light responses to optimize growth and production in indoor or outdoor cultivation in Canada -Cannabis plant strategies for acclimating to adverse environmental conditions -Plant performance upon exposure to different temperature and light conditions
Plant-microbe interactions	-Novel biofungicides -Beneficial cannabis-microbe interactions and genetic factors that offer a green sustainable approach for improving plant fitness and yield -Genomics, transcriptomics, metabolomics and imaging- based research -Microbial metagenome of susceptible and resistant cannabis chemotypes; fungal vs. <i>bacterial colonization</i> strategies to improve agriculture practices, productivity, and safety

POSTHARVEST HANDLING AND PROCESSING

Area of expertise	Description
Drying and storage	-Determine best practices for postharvest cannabis operations (sorting, curing, drying, storage and packaging) -Effect of sorting and storage on cannabis quality and the physical properties of cannabis as a function of moisture content for leaf, buds, stems, seeds -Effect of moisture and temperature over time on quality (chlorophyll, THC/CBD, chemical/microbial contaminants) -Basic physical properties of cannabis for cannabis QAQC

COMPOUND EXTRACTION, ANALYSES AND FORMULATION

Area of expertise	Description
Grinding	-Different grinding, crushing and milling techniques for plant extraction and chemical compound retention to provide a scientific basis for recommended best practices
Extraction and analyses	-Cannabinoid stability during sample preparation, extraction, and testing methods -Comparison and evaluation of extraction techniques to provide a science based research for best practise. -Method validation
Formulation	-Safe, efficient and consistent food formulation -Exploiting different secondary cannabis compounds in varied matrices, with new complexes in different chewable -Therapeutic/galenic delivery systems (chewable tablets, gums, capsules) -Emulsion delivery systems with improved compound stability and enhanced bioavailability, while maintaining bioactivity during processing

QAQC

Area of expertise	Description
Phytochemical analyses	-Low cost QA/QC analyses for product range in Canada -Sample testing with metabolomics -High throughput and sensitive/selective methods for detection and quantification of cannabis phytochemicals and contaminants focusing on regulated QAQC targets -Chemical changes with different cultivation, post-harvest handling, and extraction across genotypes and products (i.e. tinctures, oils, resins, synthetics).
Detection of microbial pathogens	-New methods for concurrent detection of mycotoxins (aflatoxin, trichothecene, fumonisin and ochratoxin) across the cannabis production/supply chain -Reliable HTP monitoring of major mycotoxin-producing fungi

For more information please contact the Program Coordinator [Dr. Sarah MacPherson](#)