

# SPEKCITON BIOSCIENCES LLC

## Mission

Spekciton Biosciences is a bioscience measurement and engineering company dedicated to:

- Consistent sustainable bioprocess and bioproduct yields, and
- Quality Control through early warning detection of viability and defects.

We develop and implement real time measurement and control solutions that increase process understanding and productivity. Spekciton Biosciences supports growers, R&D / academia, and bioech services.

## Real Time Monitoring:

- Crop plant health/stress (biotic and abiotic)
- Water and soil contamination
- Microbe growth and contamination (ex fermentation)
- Particle mixing and contamination

## Who We Are

Dr. Andy Ragone - founder/CTO

Dr. Aaron Owens - data mining

Dr Jim McCambridge – senior engineer

## Collaborators

University of Chicago (Engel group)

University of Delaware Ag Crop and Soil Sciences

University of Delaware College of Earth, Ocean and Environment

Wesley College

University of Copenhagen

Videometer A/S (Denmark)

Photon Systems Inc./ NASA JPL

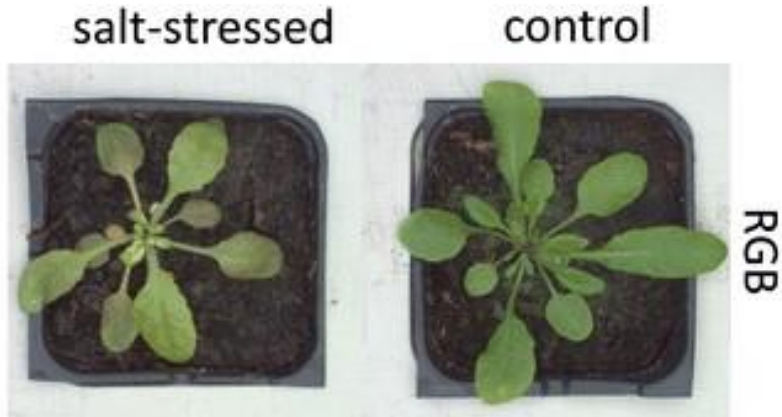
DFSME

Delaware Prosperity Partnership

Small Business Development Center (SBDC)

# Spekcion Biosciences BioAnalyzer Systems

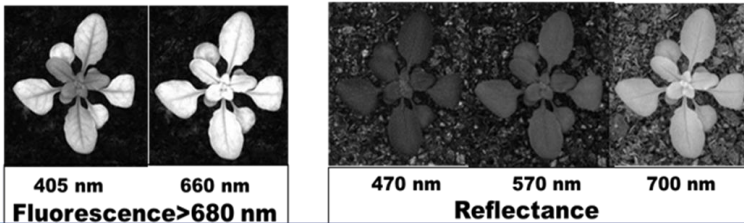
## Early plant stress detection / identification



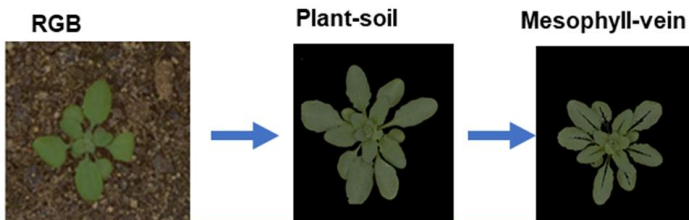
Detect and identify stress 3-5 days before other methods

## Multispectral Imaging

Multispectral Imaging (MSI) schematic:  
Arabidopsis grey scale images acquired with different wavelength LEDs



MSI enables fast spectral and physical plant structure segmentation for precise foliar stress understanding



## Microbial growth / contamination – water and soil



Detect contams at 10 ppb - in real time

## Deep UV Spectroscopy



## Contamination and mixing monitoring

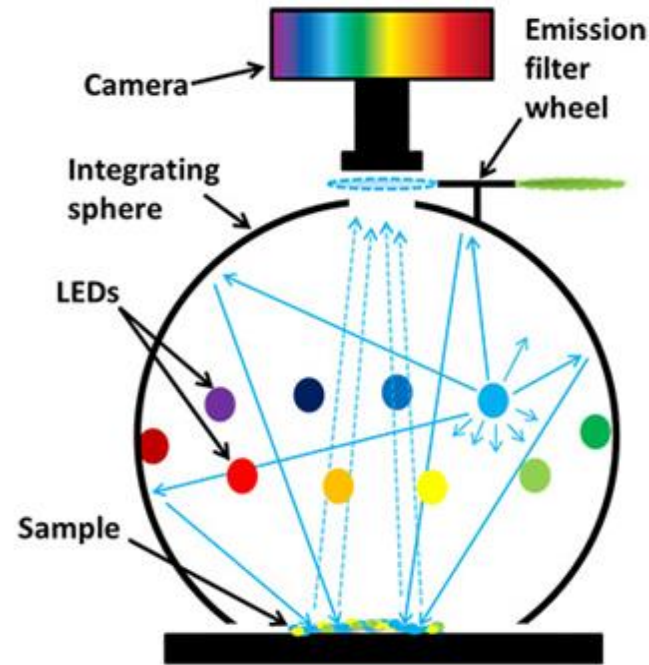


Detect particle size changes < 1 ppm in real time

## Particle Size and Distribution analysis



# VideometerLab™ multispectral imager (to be acquired)



*Figure* The VideometerLab™ multispectral imager. Left: photograph of system. The sample is placed flat within the blue circle and the integrating sphere is lowered into measurement position. The imager is 585 mm high, 420 mm wide, and 590 mm long. It weighs 14.1 kg. Right: schematic of operation. The illumination LEDs are placed around the equator of the integrating sphere. The integrating sphere creates a uniform illumination field at the sample. The camera is at the top of the instrument. A filter wheel allows fluorescence images to be taken.

