Development of Innovative Tools for Understanding Postharvest Senescence

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Introduction

We uses genetics, multi-omics, and machine learning approaches to explore the mechanisms on how genes integrate environmental cues and interact with signaling pathways to modulate plant growth in vegetables and fruits. We particularly focus on the research of vegetables and fruit for the improvement of postharvest shelf-life and food quality
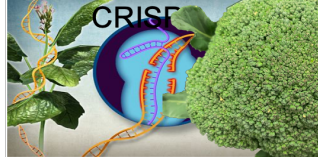
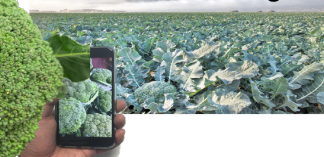## Understanding postharvest senescence in broccoli

Systems biology: Omics
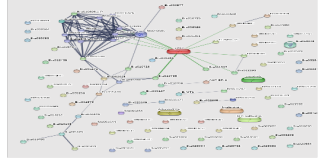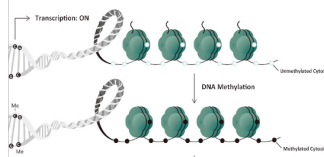
Synthetic Biology:

Functional genomics: CRISPR

Machine Learning: HSI

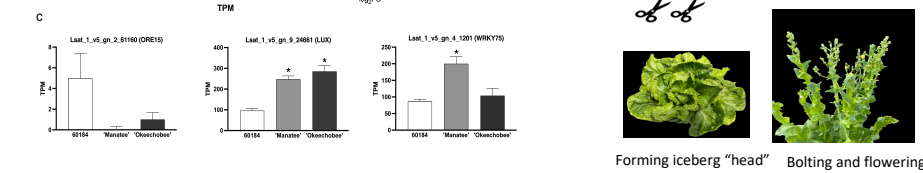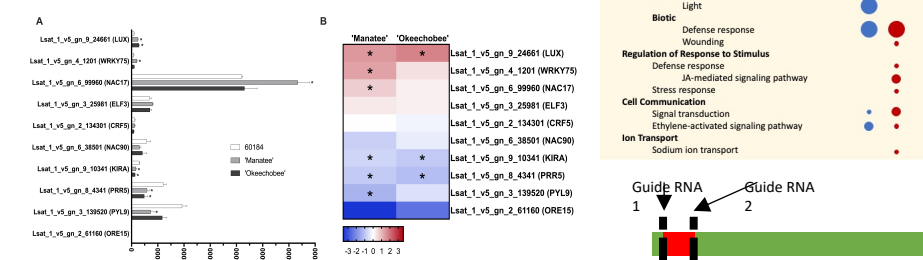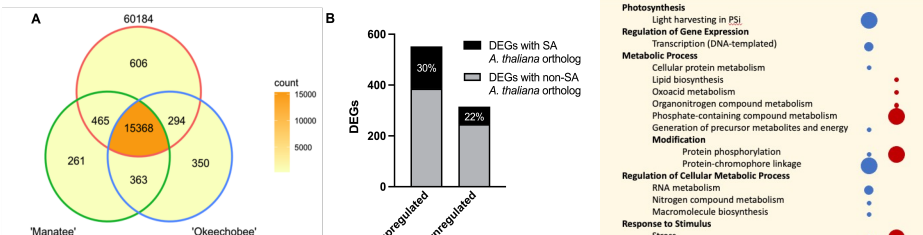**Tissue-specific or scRNA-seq**

Epigenetic Regulation

Characterization of senescence-associated genes in *Lactuca sativa* with respect to shelf life

We are investigating the transcriptional changes of twelve senescence-associated genes (SAGs) in four lettuce cultivars, accession 60184, 'Manatee', 'Tall Guzmaine', and 'Okeechobee' during postharvest storage.
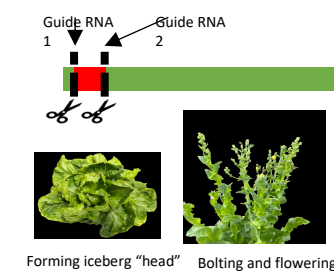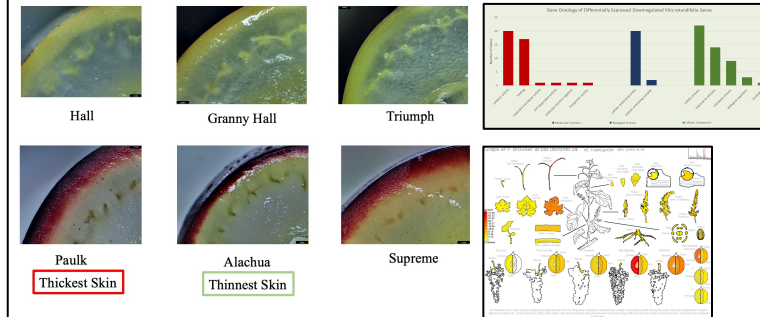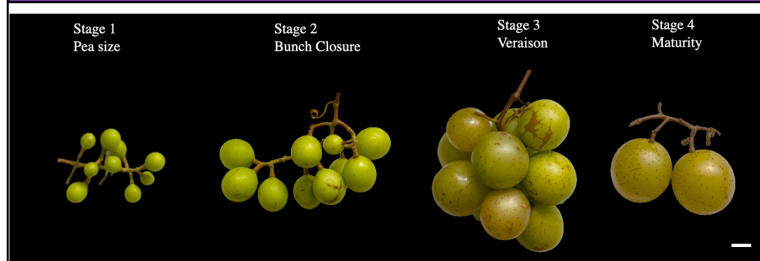

A: 60184 B: Manatee C: Tall Guzmaine D: Okeechobee

SHORTER SHELF LIFE → LONGER SHELF LIFE

Forming iceberg "head" Bolting and flowering

Tissue-Specific Transcriptome Profiling of Muscadine Grape (*Vitis rotundifolia*) Skin Reveals Promising Candidate Genes Involved In Skin-Thickness

Hall Granny Hall Triumph

Paulk — Thickest Skin Alachua — Thinnest Skin Supreme

Abscission Zone Characterization in *Vitis rotundifolia*

Stage 1 — Pea size
Stage 2 — Bunch Closure
Stage 3 — Veraison
Stage 4 — Maturity

Stage Label	Name	Characteristics
S1	Berry Formation to Lag Phase	Berries begin to grow through cell division, pea size, approx. 7 mm in diameter
S2	Lag phase	Pause in berry growth, seed embryos grow rapidly. Green and mature.
S3	Veraison	Berries accumulate acids and tannins. Start to change color
S4	Berry Ripening/ Harvest ripe	Color accumulation, sugars accumulate and acids decrease

Acknowledgements

Fresh Produce RESEARCH CENTER

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