

Progress in Cell Line Development

Wagner Vendrame
Associate Professor
TREC-IFAS-UF, Homestead



Vision – ISS National Lab

- Plant cell's structural and physiological responses to microgravity – Challenges and Opportunities
 - Plant-based life support - Advanced Life Support (ALS) Concept
 - Plant-based products
- 



Objectives

- To evaluate the structure and growth of plant cells in suspension cultures in microgravity:
 - Cell structural changes
 - Cell growth/development
 - Differential gene expression
- 



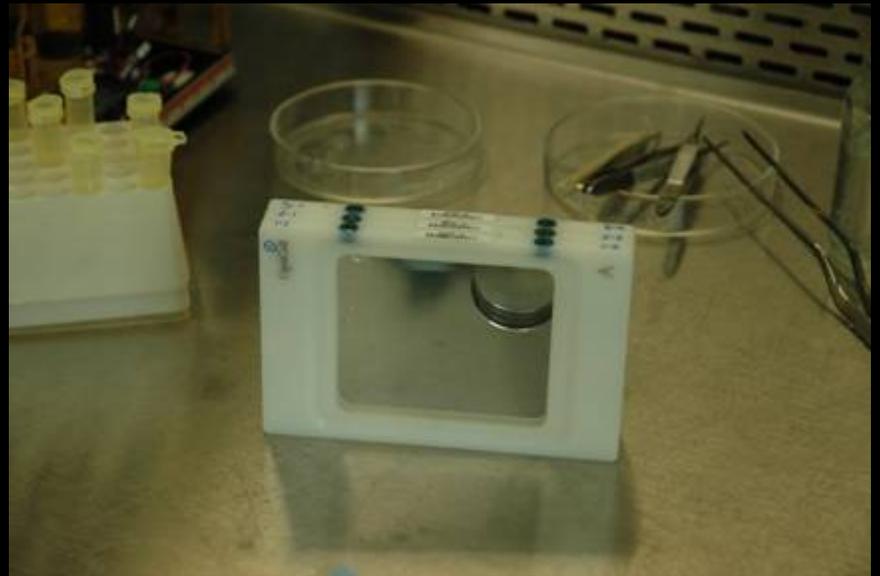
Our challenges

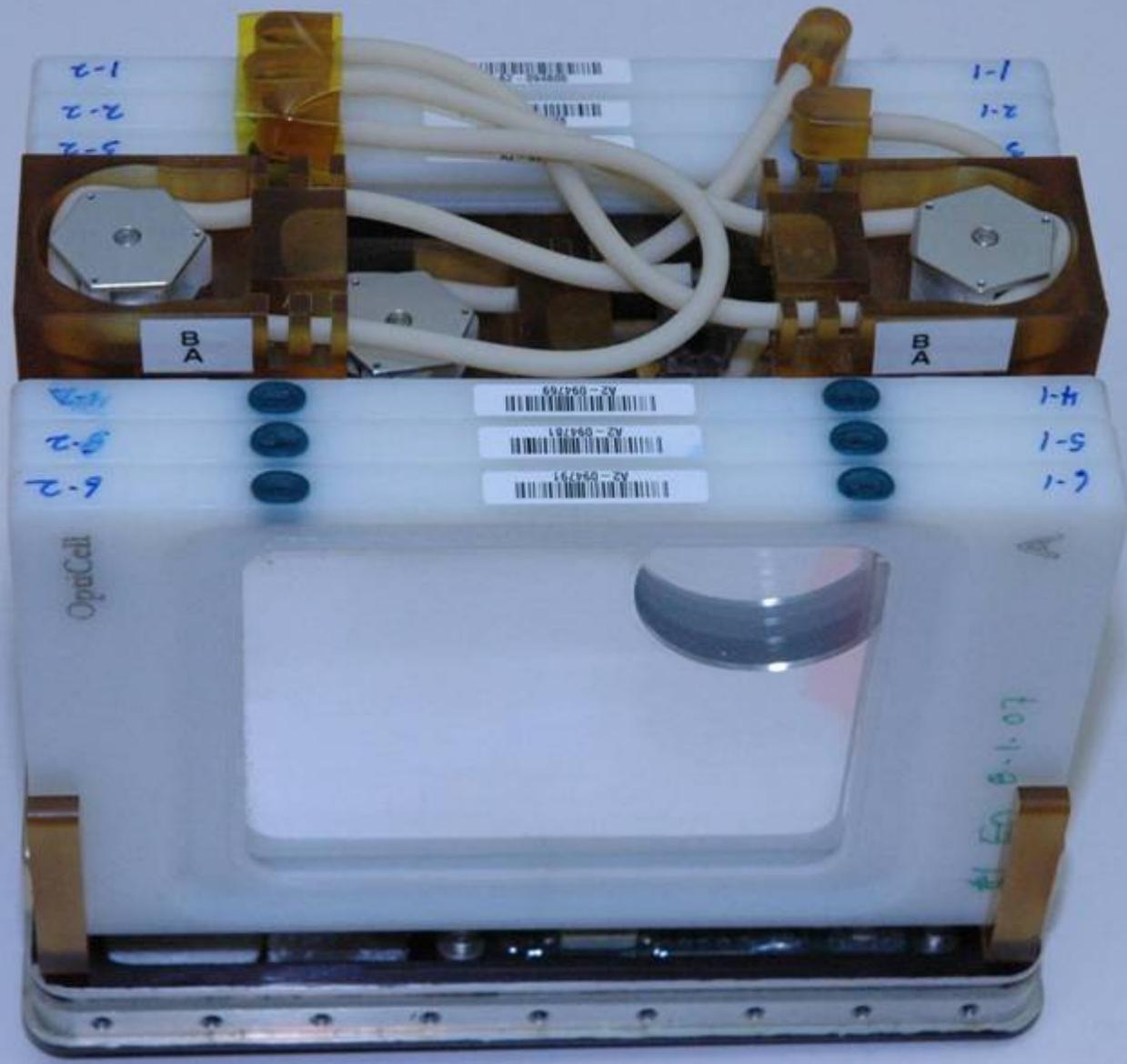
- Simple and self-contained or automated system.
 - Balance between simplicity and flexibility.
 - Reproducibility.
- 

Our approach

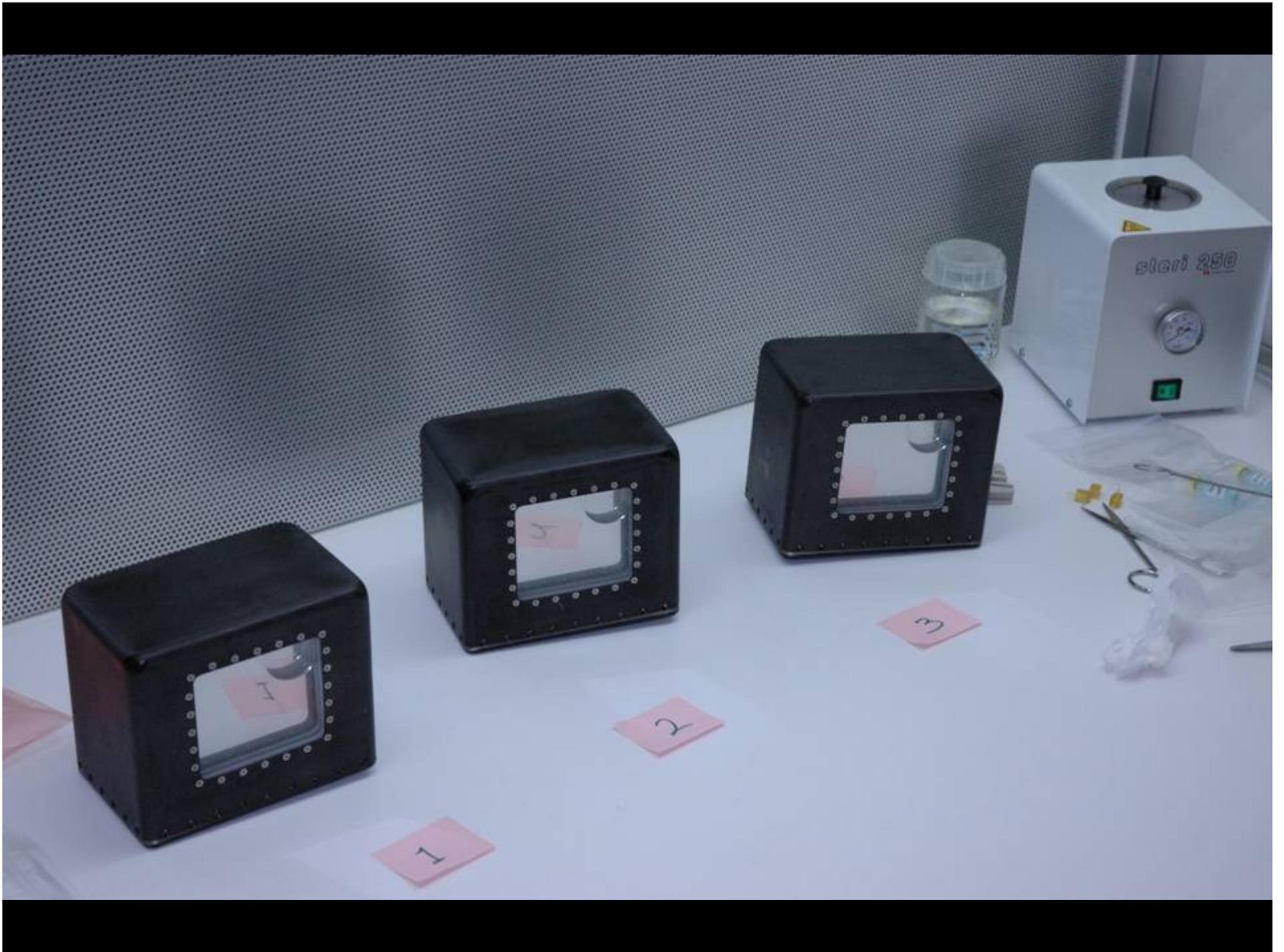
- Cell suspension cultures:
 - *Arabidopsis thaliana*
 - *Encyclia plicata*
 - *Caesalpinia pulcherrima*
 - *Tabebuia aurea*
- BioServe:
 - Pre-existing hardware: CHAB/CGBA
 - Logistics; clearances, permits















STS-118 Endeavour

August 8, 2007







STS-120, Discovery

November 7, 2007

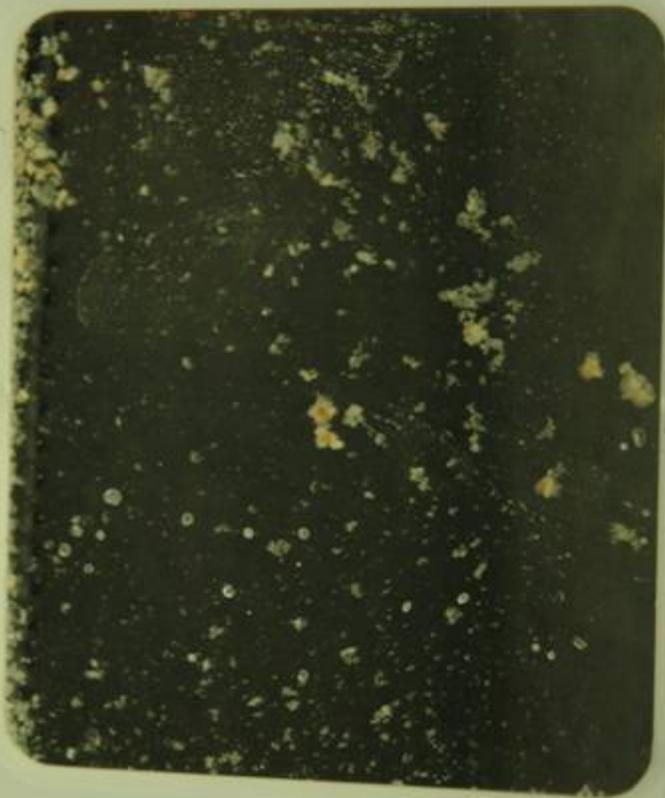


Our methods

- Visual observations:
 - CSI camera modules – images down-linked every hour for 3 months
- Histological Studies:
 - Cell ultrastructure (TEM)
- Differential Gene Expression:
 - Microarrays



OptiCell



#3 C.P 8.1.07

A

OptiCell



#3 C.P 8.1.07

A

Acknowledgments

- SPACEHAB, INC.
- BIOSERVE (University of Colorado)
- ZERO GRAVITY, INC.
- Dr. Rob Ferl, Dr. Anna-Lisa Paul, Mrs. Beth Laughner - Hort Sciences, UF
- Mrs. Ania Pinares – Lab, TREC





Thank you!





Animal Cell Research

- Dr. Neal Talbot – Research Animal Scientist
 - Dr. Thomas Caperna – Research Biologist
 - USDA-ARS, Beltsville, MD
 - Dr. Peter Hansen – Professor
 - IFAS – University of Florida, Animal Sciences
- 