

# **North Carolina A&T's Center of Excellence in Post-Harvest Technologies: An Equitable 1890- 1862 Partnership**

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# Facilities



Perspective View



Core Laboratory



Plants for Human Health  
Building/N.C. State



Perspective of  
Central Campus



Nutrition Research  
Building/NC A&T

# Core Laboratory



CORE LABORATORY BUILDING

NORTH CAROLINA RESEARCH CAMPUS  
KANNAPOLIS, NORTH CAROLINA

# Core Lab - Construction Facts

- ~ 250 lbs. of marble
- > 1.5 million bricks
- > 450 feet long, or the size of 1 ½ football fields
- ~ 300,000 sq. ft., or almost 60,000 sq. ft. per floor
- Materials used from four of earth's continents and from 16 different countries: USA, Canada, Brazil, Argentina, France, Germany, Switzerland, Mexico, China, Japan, Thailand, Ireland, India, Turkey, Sweden and Finland

# Highlight of the Equipment

- The Bruker 950-megahertz nuclear magnetic resonance spectrometer—the world's most powerful superconducting magnet.
- The two-story, 8-ton machine will significantly enhance key areas of research, such as drug development and nutrition.
- The NMR will allow scientists to deduce the structure of larger and more complex molecules, leading to many discoveries of new therapies or to uncover how certain vitamins cause changes in cells.

# North Carolina Research Campus

- A private-public venture created to foster collaboration and further advances in the fields of biotechnology, agriculture, nutrition and health
- More than a million square feet of state-of-the-art laboratory and office space
- Billionaire David Murdock (\$1.5 billion)
- Cannon Mills → Fieldcrest → Pillowtex

# The Vision

- Create a world-class research hub where collaborative science will lead the charge for great discoveries in nutrition, health and biotechnology research.
- Become the world's epicenter of nutrition and disease research
- “The N.C. Research Campus will be a thriving scientific community where the best minds will shape the way we understand nutrition and its relationship to disease.”

–David H. Murdock, owner of Dole Foods Company, Inc.

# Partners and Roles

NC State

NC A&T

UNC Charlotte\*

UNC

Duke

UNCG

NC Central

Production  
Selection  
Of Plant lines  
Produce  
Safety

Post Harvest  
Technologies  
(Processing, Bioactive,  
Safety, Product  
Development)

Nutrigenomics  
Metabolomics  
Chronic Diseases  
Treatment/Prevention

Translational  
Medicine and  
Drug  
Development

Bioactives and  
Human Nutrition

In Vivo Models  
for Biomedical  
Testing

\*UNC Charlotte will be conducting Bioinformatics Research



# How did this happen?

- **A conversation**
- **A think tank**
- **A well thought-out and complementary proposal**
- **Equitable partnership**
- **Funding from the N.C. General Assembly**

# How can A&T benefit?

- **Access to top research facilities**
- **Collaboration with leading scientific minds and universities**
- **Opportunities to develop, test, and refine new product ideas *(with access to top talent and facilities)***
- ***Opportunities for Intellectual Property and spin-off companies***
- **Expanded opportunities – students and faculty**
- **Strengthen our land-grant mission**

# **SAES Strategic Plan**

## **(Goals/Fall 2005)**

- Improve minority and environmental health**
- Ensure a nutritious, safe and secure food supply**
- Advance biotechnology**
- Ensure the viability of small scale agriculture**
- Protect the environment and natural resources**
- Expand resource base and maximize relationships**

# NCA&T Center Of Excellence in Postharvest Technologies

- Focus on Foods (Fruits and Vegetables) and Health
- Onsite Center faculty (Core faculty/SAES)
- Off-site Affiliate faculty
- Opportunities for Interdisciplinary Collaboration/synergy
  - Core Lab
  - Joint projects
  - Experiential learning/training
- Center Goal: to be self sustaining through extramural funding for high caliber research

# Mission

- Develop new and improved post harvest technologies while creating synergistic collaborations with other partners at the NC Research Campus to enable breakthroughs in science that generate knowledge, create jobs, and improve the quality of life and economic status of citizens in NC, US, and globally.

- Post-harvest areas

Processing and preservation, storage stability, safety and quality, nutritional composition, recovery and identification of bioactive compounds for health applications (functional foods), product development, consumer research, value-added processing, etc.

# Research Enterprise

## ■ **Health Promoting Food Components\***

- ✓ Isolation and characterization of bio-active compounds.
- ✓ Development of functional foods and nutraceuticals

## ■ **Food Safety Issues\***

- ✓ Rapid and reliable methods for monitoring pathogens in produce
- ✓ Safe minimal processing to inactivate food-borne pathogens and eliminate other food contaminants

## ■ **Storage stability related to shelf-life and quality**

- ✓ New technologies for predicting and extending the shelf-life and quality
- ✓ Effect of storage and processing on nutrients and bioactive compounds

## ■ **Value-added product development\***

- ✓ Development of new value-added food and non-food uses
- ✓ Evaluation of products' quality and consumers acceptability

*\* Center projects in these areas were recently funded by the USDA (~\$2.5 million)*

# Outreach Enterprise

- Facilitate transfer of discoveries in the areas of post harvest technologies
- Actively seek science-based solutions to post-harvest issues facing growers, processors, distributors, and consumers of agricultural commodities (with focus on fruits and vegetables)
- Build mutually beneficial partnerships with the industry
- **Examples of outreach activities**
  - ✓ Seminars, short courses, audiovisual and print materials
  - ✓ Consultancy, technical assistance, and contract research
  - ✓ Analytical and diagnostic services

# Experiential Learning/Training

- Experiential learning and training of students/young scientists on cutting-edge science and technologies for enhanced competitiveness in the job market
- Hands-on experiences in pertinent aspects of post harvest technologies
- Multidisciplinary training opportunities through shared resources and synergies with other NCRC partners



# Academic Enterprise

- Request authorization to plan and establish a doctoral program in Food and Bioprocess Technologies
- USDA Capacity-Building Grant to Plan and Establish

# Questions/Interest

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## ■ Visit:

– NCA&T/SAES Link

<http://www.ag.ncat.edu>

– NC Research Campus:

<http://www.ncresearchcampus.net/>