WELCOME TO BRITE
N.C. LEGISLATIVE JOINT LIFE SCIENCE CAUCUS

Faye Calhoun, DPA, MS
Interim Director
Biomanufacturing Research Institute & Technology Enterprise (BRITE)
September 22, 2017
Biomanufacturing Research Institute and Technology Enterprise

BRITE is:

• Workforce Development
• Economic Development
• Translational Medicine Research

A nationally recognized program at NCCU established to train future generations of biotechnology scientists prepared to work in the Pharmaceutical and Biomanufacturing Industry.

An academic program providing a mix of classroom and laboratory based instruction with the latter focused on developing skills relevant to industry.

A program with a strong research focus, particularly in the areas of drug discovery and manufacturing technology with a faculty of scientists conducting scientific research to have an impact on human health and disease.
BRITE’s History

• November 17, 2004 plan to NCCU Board of Trustees

• Dr. Li-An Yeh hired as Director

• NC Biomanufacturing and Pharmaceutical Training Consortium 2005

• 13 Faculty  7 with industry experience

• Biogen Idec transfers 350,000 Compound Library to BRITE 2005

• Student enrollment in 2006

• $20.1 M from Golden LEAF Foundation - 52,000 sqf facility completed 2008

• $10 M + in Capital Equipment purchased 2006-2008
Academic Mandate
BRITE and the Department of Pharmaceutical Sciences

To establish and evolve programs at the B. S., M. S., and Ph. D. levels that provide students with the scientific education, technical and leadership competencies for careers in the biotechnology and pharmaceutical industries.

North Carolina Central University
### BRITE and the Department of Pharmaceutical Sciences

- **11 Tenure faculty members**
- **3 non-tenure research faculty members**
- **11 Lab Instructors and research scientists**
- **Faculty work load: 50% teaching, 50% research**

<table>
<thead>
<tr>
<th>Professor</th>
<th>Associate Professor</th>
<th>Associate research Professor</th>
<th>Assistant research Professor</th>
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<tbody>
<tr>
<td>Dr. A. Li</td>
<td>Dr. G. Ibeanu</td>
<td>Dr. T. Ding</td>
<td>Dr. C. Oldham</td>
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<tr>
<td>Dr. J. Xie</td>
<td>Dr. D. Lopez</td>
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<td>Dr. R. Onyenwoke</td>
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<tr>
<td>Dr. L Yang</td>
<td>Dr. J. Scott</td>
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<tr>
<td>Dr. Kumar</td>
<td>Dr. J. Sexton</td>
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<td></td>
<td>Dr. A. Williams</td>
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<td></td>
<td>Dr. K.P. Williams</td>
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<td>Dr. W. Zheng</td>
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Collaborations and Partnerships

**Academic**
- UNC Chapel Hill
  - Collaborative Research on Alcohol Pathology
  - Lineberger Comprehensive Cancer Center
  - School of Pharmacy: Data Science Infohub for Rare Diseases
- **NCCU-Duke Partnership** - pilot research, community engagement, workforce development
- Duke Cancer Institute
  - Breast and prostate research
  - Komen grant – graduate training
- National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL)
  - Consortium of academic and industry members supported by the National Institute of Standards and Technology/Dept of Commerce.
  - NCCU/BRITE is an academic level 2 member focused on workforce development

**Industrial**
- Eli Lilly & Co. – Drug Discovery
- Southeast Techinventures – drug development, diabetes.
- Zen Bio Inc. – drug development, metabolic diseases
- Arthrotech – Biomarker for CVD
- PPD Biotech – Drug development – chronic liver disease
- Womack Army Medical Center-MOU
- Novo Nordisc- worker training
- BioSpecifics – Uterine fibroid technology.
- NIH/NCATS – HTS Ring Initiative
The National Institute for Innovation in Manufacturing Biopharmaceuticals
NIIMBL

• NIIMBL is a industry responsive consortium to advance pharmaceutical manufacturing through innovation, collaboration and education among participant organizations including industry, academia, federal, state and local governments

• NCCU/BRITE is an academic level 2 participant focused on workforce development

• Industry needs readily available hands on training, new analytical methods, certificate programs, advanced manufacturing techniques

• UNC System Participants include:
  • NC State University/BTEC
  • BioNetwork
  • North Carolina Central University
  • UNC Wilmington
  • UNC Chapel Hill
  • East Carolina University
## BRITE
### Active Awards as of SEPTEMBER 2017

<table>
<thead>
<tr>
<th>SPONSOR</th>
<th>AWARD TITLE</th>
<th>AWARD AMOUNT</th>
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<tbody>
<tr>
<td>National institutes of Health (NIH)</td>
<td>1/2 NCCU-DUKE Cancer Disparities Translational Research Partnership</td>
<td>$234,900.00</td>
<td>WILLIAMS, KEVIN</td>
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<tr>
<td>National institutes of Health (NIH)</td>
<td>1/2 NCCU-DUKE Cancer Disparities Translational Research Partnership</td>
<td>$229,982.00</td>
<td>WILLIAMS, KEVIN</td>
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<tr>
<td>Duke University</td>
<td>Bridging Interdisciplinary Research Careers in Women's Health - BIRCWH</td>
<td>$124,983.00</td>
<td>WILLIAMS, KEVIN</td>
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<tr>
<td>Triangle Center for Evolutionary Medicine</td>
<td>Epigenetic regulation of PCSK9 and the onset of metabolic diseases in diverse ethnic groups</td>
<td>$15,500.00</td>
<td>LOPEZ, DAYAMI</td>
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<tr>
<td>DOD DA Womack Army Medical Center</td>
<td>Establishing normal parameters for total and active serum PCSK9 levels: A feasibility study (sub-contract)</td>
<td>$2,800.00</td>
<td>LOPEZ, DAYAMI</td>
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<tr>
<td>University of North Carolina at Chapel Hill</td>
<td>From Man to the Lab and Back to Man - Using semantic RDF database to enable drug repurposing</td>
<td>$59,980.00</td>
<td>ZHENG, WEIFAN</td>
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<td>University of North Carolina at Chapel Hill</td>
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<td>ZHENG, WEIFAN</td>
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<tr>
<td>NIH National Institute of General Medical Sciences (NIGMS)</td>
<td>Identification and confirmation of blood-brain barrier (BBB) permeability of chemical enhancers of nerve growth factor-dependent neurite outgrowth</td>
<td>$97,200.00</td>
<td>IBEANU, GORDON</td>
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<td>NIH National Institute of General Medical Sciences (NIGMS)</td>
<td>Identification and confirmation of blood-brain barrier (BBB) permeability of chemical enhancers of nerve growth factor-dependent neurite outgrowth</td>
<td>$10,800.00</td>
<td>IBEANU, GORDON</td>
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<td>National institutes of Health (NIH)</td>
<td>In Vivo Neuroprotective and Pharmacological Studies of Plant-produced Asialo-erythropoietin</td>
<td>$360,000.00</td>
<td>XIE, JIAHUA</td>
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<td>National institutes of Health (NIH)</td>
<td>Targeting DYRK1A Modulation of GLI1 for Anti-Tumor Efficacy</td>
<td>$375,830.00</td>
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<td>Susan G komen for the Cure</td>
<td>Training Minorities in Research to Reduce Breast Cancer Disparities</td>
<td>$135,000.00</td>
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<td>Qwest Diagnostics Inc.</td>
<td>Clinical Development and Validation of total and active PCSK9 assays</td>
<td>$184,507.20</td>
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<td>National Science Foundation</td>
<td>Collaborative Research Microbicidal Carbon Dots for combating Anti-Biott Resistance and Beyond</td>
<td>$240,000.00</td>
<td>Yang, Liju/Tang</td>
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Total amount: $2,091,704.20
Diverse Student Population

• High School Students (pathway initiatives)

• Community College Students
  (AS, AAS, Certificates etc.)

• 4 Year transfers

• Career Change Students (2nd/3rd degree)

• Incumbent Workers
Agreements with Community Colleges

Asheville-Buncombe Community College
Piedmont Community College
Durham Technical Community College
Vance-Granville Community College
Halifax Community College
Pitt Community College
Wayne Community College
Johnson Community College
Forsyth Technical Community College
Guilford County Community College
Alamance County Community College
Fayetteville Technical Community College
Wake Technical Community College
### BRITE Enrollment 2012 – 2017

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<tr>
<th></th>
<th>2012</th>
<th>2013</th>
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### BRITE Graduation per year 2013 – 2016

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
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<th>2015</th>
<th>2016</th>
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<tbody>
<tr>
<td>BS</td>
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<tr>
<td>MS</td>
<td>6</td>
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BRITE 2017 Pilot Summer Program

• 11 students (rising sophomore to rising junior)
• Residential with 2 RA’s
• 4 weeks, 6 credit hours, including Basic lab skills and Intro to Pharm Sci
• Professional development activities: speakers, workshop
• External Visits: BTEC, EPA, Fujifilm

• Feedback: 8 /11 students interested in Industry/Biotech as a result of this experience; 3 to pharmacy degree
BRITE FUTURES PROGRAM
Grades 5-12

• Tours, conversations with scientists, STEM lab activities, and highlight STEM careers

• Summer camps for middle and high school students

• Professional development workshops for middle and high school teachers: 534 since 2008; 107 in 2016-17

• Served 83 of 100 counties since 2008; 19 counties in 2016-17
NC Counties Served, 2016 - 2017

Alamance  Northampton
Cumberland  Orange
Duplin  Rockingham
Durham  Scotland
Edgecombe  Person
Franklin  Pitt
Guilford  Vance
**Martin**  Wake
Mecklenburg  Warren
Nash

A total of 19 counties served
STRATEGIES FOR SUCCESS

■ Maintain industry relationships
■ Re-connect with BRITE Alumni
■ Engage the BRITE Advisory Committee
■ Participate in industry networking events, NC BIOTECH, BioImpact, and Legislative events
■ Coordinate industry visits and sponsor a BRITE Career Expo