Our mission is to improve the health of the elderly in Kentucky and beyond through research dedicated to understanding the aging process and age-related brain diseases, and outreach/education and clinical programs that promote healthy brain aging.
• Alzheimer’s disease and related dementias
• Mixed pathology
• Healthy brain aging
• Risk factors
  – Down syndrome (DS)
  – Vascular co-morbidities
    • including stroke
  – Traumatic brain injury (TBI)
  – Inflammation
  – Genetics, lifestyle
Research at SBCoA is Growing

260% increase in research funding in 5 years

For FY19, this funding was to 16 faculty

Helping other units on campus

AD/ADRD supplements:
- Alan Daugherty- Cardiovascular
- Matt Gentry- Metabolism
- Daret St Clair- Cancer
- Olivier Thibault- Diabetes
**Example: a UK-ADC Pilot Research Project**

**Visual Arts Education improves self-esteem for persons with dementia and reduces caregiver burden: A randomized controlled trial**

**Allan G Richards and Ann C Tietyen**
University of Kentucky, Lexington, KY, USA

**Gregory A Jicha, Shoshana H Bardach, Frederick A Schmitt, David W Fardo, Richard J Kryscio and Erin L Abner**
Sanders-Brown Center on Aging, University of Kentucky, Lexington, KY, USA

**Key Points**

- **Patient Self-Esteem Maintained**
  - Graph showing self-esteem levels for persons with ADRD in VAE and Control groups.
  - P-value: 0.028

- **Caregiver Burden Reduced**
  - Graph showing ZARIT scores for caregivers in VAE and Control groups.
  - P-value: 0.01

**Partnership:**
College of Fine Arts and SBCoA/UK-ADC investigators

**Caregivers and Persons with ADRD**

**VAE**

- Patient Self-Esteem Maintained
- Caregiver Burden Reduced

**Control**

- Patient Self-Esteem Maintained
- Caregiver Burden Reduced

**Ann Tietyen, MS and Allan Richards, PhD**

**Partnership:** College of Fine Arts and SBCoA/UK-ADC investigators
“It is so difficult for someone with [Alzheimer’s] to have the confidence to do anything, especially new things. With the help, guidance, encouragement, love, and understanding of Allan and Ann, and the support of the others in the class, it became easier for all of them to once again succeed in something.”

“To see the joy and hear the laughter and see the accomplishments from all the participants, especially my husband, was worth our 4-hour round trip drive to Lexington every week.”

**Plans:**

NIH R01 grant application being developed by Ms. Tietyen/Dr. Richards.

UK-ADC Data Core providing advice on study design and grant preparation.
Dementia is not always AD.

In the elderly, there are mixed pathologies and common AD mimics that increase dramatically with age.
Example: Research on MCI-CVD & Biomarkers of VCID

MCI-CVD = Mild Cognitive Impairment due to Cerebrovascular Disease
VCID = Vascular contributions to Cognitive Impairment and Dementia

Leverage existing ADC data/biospecimens

Develop new collaborative grants; e.g.,

- **R01 NR14189** Jicha, Nelson, Moser: Early detection and prevention of MCI due to CVD
- **R01 NS079637** Wilcock: Vascular breakdown in AD with CVD
- **R01 NS097722** Wilcock, Norris: Neurovascular astrocyte dysfunction in VCID

Build transdisciplinary partnerships for new large NIH awards to develop biomarkers of AD and vascular dementia

- **P30 AG028383** Wilcock/Van Eldik: UK-ADC Biomarker Core
- **UH2/UH3 NS100606** Wilcock/Jicha: Small vessel disease biomarkers in a longitudinally-followed “stroke-belt” cohort (MARK-VCID).
Index-Stroke Characteristics, Heritability, Epidemiology, Mechanisms, and Influences of Alzheimer pathology in the development of post-stroke Dementia: The ISCHEMIA-D Study

Multiple partners (Rush, Indiana, Univ Kansas, Vanderbilt, Emory, Duke, UT Memphis).

Critically important for Kentucky, a major “stroke-belt” state with high mortality.
Example: Research on LATE

LATE: Limbic-predominant age-related TDP-43 encephalopathy

TDP-43 deposits, not AD plaques and tangles.

TDP-43 pathology is seen in ALS, FTD, but LATE is ~100x more common. TDP-43 deposits are also in different parts of the brain compared to AD.

20-50% of people >80yo will have LATE brain changes, and prevalence increases with age.

But no one had defined it before now.

Very important for therapy: targeting the right disease

A precision medicine approach to the treatment of Alzheimer’s & related dementia

Where the dementia field is now

- One-size fits-all medicine
  - Patients are grouped by: Disease, Subtypes, Demographics, Clinical features, Biomarkers

Where Sanders-Brown will take the dementia field

- Stratified medicine
  - Patient individual: Preferences, Clinical features, Medication history, Environment, Behaviours & habits, Biomarker

- Precision medicine
Racing to defeat dementia

Sanders-Brown Center on Aging