2018-2019 Research Report to UKRF Board of Directors

Lisa A Cassis, PhD
Professor, Department of Pharmacology and Nutritional Sciences
Vice President for Research
Format

• Progress on the Research Strategic Plan
• Presentation of FY19/20 budget
Office of the Vice President for Research

Research Strategic Plan

Expand our scholarship, creative endeavors, and research across the full range of disciplines to focus on the most important challenges of the Commonwealth, our nation, and the world.

I. Invest in UK’s existing strengths and areas of growth in selected focus areas that benefit and enrich the lives of the citizens of the Commonwealth and beyond.

II. Recruit and retain outstanding faculty, staff and students that support our research and scholarship across the range of disciplines at the University.

III. Improve the quality of the research infrastructure across campus.

IV. Strengthen engagement efforts and translation of research and creative work for the benefit of the Commonwealth of Kentucky, the nation and the world.
Research Priority Areas (RPA): Supporting research strengths that impact the Commonwealth

I. Invest in UK's existing strengths and areas of growth in selected focus areas that benefit and enrich the lives of the citizens of the Commonwealth and beyond.

Criteria for Selection:

- **Local relevance** of the research, global impact
- **Existing faculty strength** and research leadership
- Disciplinary **research diversity**
- Potential interconnections of research with **educational opportunities**
- **Impact** (economic, health, etc) of research on UK and the Commonwealth
- **Sustainability** of research
### Criteria: Local relevance

<table>
<thead>
<tr>
<th>Health Disparity</th>
<th>KY 2017 Ranking (50 is worst)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug Deaths</td>
<td>49</td>
</tr>
<tr>
<td>Obesity</td>
<td>44</td>
</tr>
<tr>
<td>Cancer deaths</td>
<td>50</td>
</tr>
<tr>
<td>Cardiovascular deaths</td>
<td>44</td>
</tr>
<tr>
<td>Diabetes</td>
<td>46</td>
</tr>
<tr>
<td>All health outcomes</td>
<td>46</td>
</tr>
</tbody>
</table>

*America’s Health Rankings, 2017*
Criteria: Existing strength defined by extramural funding (2017)

The two graphs are not at the same scale.

Note: Expenditures for each thematic area are not mutually exclusive. Projects may be represented in one or more areas. Additionally, expenditures are based on keyword searches and may not include all related projects and may contain some projects that aren't specific to that area of research.
## Criteria: Existing strength in research scholarship

<table>
<thead>
<tr>
<th>Strength</th>
<th>Scholarly Output</th>
<th>Citations</th>
<th>Citations/publication</th>
<th>Field-weighted citations</th>
<th>% Publications in top tier journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>4,715</td>
<td>63,120</td>
<td>13.4</td>
<td>1.73</td>
<td>50</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>3,282</td>
<td>39,658</td>
<td>12.2</td>
<td>1.71</td>
<td>50</td>
</tr>
<tr>
<td>Diabetes/obesity</td>
<td>2,709</td>
<td>38,383</td>
<td>14.2</td>
<td>1.80</td>
<td>52</td>
</tr>
<tr>
<td>Energy</td>
<td>4,268</td>
<td>47,518</td>
<td>11.1</td>
<td>1.65</td>
<td>48</td>
</tr>
<tr>
<td>Neuroscience</td>
<td>6,592</td>
<td>75,839</td>
<td>11.5</td>
<td>1.66</td>
<td>48</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>1,974</td>
<td>19,481</td>
<td>9.9</td>
<td>1.40</td>
<td>42</td>
</tr>
</tbody>
</table>

Source: SciVal by Elsevier. 2012 through 2018
Criteria: Research sustainability

Note: Expenditures for each thematic area are not mutually exclusive. Projects may be represented in one or more areas. Additionally, expenditures are based on keyword searches and may not include all related projects and may contain some projects that aren’t specific to that area of research.
<table>
<thead>
<tr>
<th>Thematic Area</th>
<th>Approximate # of PIs</th>
<th>Colleges (Departments) Involved</th>
</tr>
</thead>
</table>
| **Cancer**           | 47 patents           | Agriculture, Food, and Environment (2)  
Arts and Sciences (3)  
Engineering (2)  
Health Sciences (1)  
Medicine (12)  
Nursing  
Pharmacy (2)  
Public Health (5) |
| **Diabetes & Obesity** | 130                  | Agriculture, Food, and Environment (2)  
Arts and Sciences (1)  
Medicine (5)  
Nursing  
Pharmacy (1)  
Barnstable Brown Diabetes Center |
| **Cardiovascular**   | 156                  | Agriculture, Food, and Environment (1)  
Arts and Sciences (2)  
Engineering (2)  
Health Sciences (2)  
Medicine (11)  
Nursing  
Pharmacy (1)  
Public Health (6) |
| **Substance Abuse**  | 41 patents           | Agriculture, Food, and Environment (2)  
Arts and Sciences (3)  
Engineering (2)  
Health Sciences (1)  
Medicine (8)  
Nursing  
Pharmacy (2)  
Public Health (4)  
Center on Drug & Alcohol Research  
KY Injury Prevention Research |
| **Neuroscience**     | 20 patents           | Arts and Sciences (2)  
Dentistry (2)  
Engineering (1)  
Health Sciences (2)  
Medicine (12)  
Nursing  
Pharmacy (2)  
Public Health (3)  
Sanders-Brown Center on Aging  
Spinal Cord & Brain Injury Research |
| **Energy**           | 27 patents           | Agriculture, Food, and Environment (7)  
Arts and Sciences (7)  
Design (1)  
Engineering (8)  
Public Health (2)  
Center for Applied Energy Research  
KY Geological Survey |
Financial support system for Research Priority Area program

• Strategic Investment Funds within the UKRF budget (IIC.7b):
  • For FY18/19: Approximately $425K distributed to each priority area.
  • For FY19/20: 7% of UKRF budget ($3.99M)

Examples of use include:
  • Start-up funds for targeted recruits
  • Support mechanisms for research
  • Equipment
  • Research symposia, seminars

• $1M competitive pool, FY18/19 funds were targeted to substance abuse/opioid initiatives
Can this approach make a difference?

- **Example: Substance Use Disorder (SUD) group**
  - Began thematic coordination with this group in early 2017
  - SUD group began to coalesce, worked on thematic template to illustrate current strengths, future growth needs
  - Had first institution-wide research day in early 2019 (140 participants, 70 poster presentations)
  - Worked together on HEALing Communities grant with leadership in place (Dr. Sharon Walsh), with support from several research offices.
  - One of 4 states to obtain NIH HEALing Communities and Networks Helping End Addiction Long-term: $87,133,542, with the goal of reducing drug-related deaths by 40%.
  - The coming together of this research priority area under strong leadership, and in alignment with the research enterprise, epitomizes what we hope to see with this initiative.
II. Recruit and retain talent

- Instituted incentive-based program for distribution of faculty start-up needs. Start-up funds are 20% of the UKRF budget (IIC.1b), and are disseminated to Deans of each college through an incentive-based formula.

- Revised structure of the Research Professorship Program to recognize excellence in research and creative work within each College (IIC.3a).

- For FY19/20: Professional honors and awards staff added to the Proposal Development Office (I.B.1)
  - Create a database of faculty honors and awards and a database of national research awards of prominence across disciplines
  - Use SciVal and other mechanisms to identify faculty competitive for honors and awards
  - Assemble professional nomination packets
Recruit and retain talent: Support for Creative Activities (II.C.3a)

Support grant program for research, scholarship, and creative works in areas of excellence that are not traditionally amenable to external funding

Since FY 2017
Awarded $600,000 for creative & scholarly activity

- Research & Field Work
- Research Subject Support
- Student Support
- Conferences

- Art Exhibits & Performances
- Studio Recording
- Publishing & Book Writing
Recruit and retain research talent: start-up support for hiring of faculty from under-represented groups (II.C.7a)

- Instituted a dedicated pool of funds ($500K from Strategic Investment Fund pool for FY18/19) for start-up needs to recruit faculty from under-represented minorities. Developed this new program offering in collaboration with VP for Diversity and Inclusion, Provost.

- To date, $250,000 in start-up funds committed to the following hires:
College of Education

Dr. Isaac Woods, Educational, School, and Counseling Psychology
Appointment Begins: 8/16/2019
PhD from the University of Memphis
Postdoctoral Fellowship, Boston Children’s Hospital/Harvard Medical School
Research Area: Psychology, Social Justice in Mental Health Counseling and Education

Dr. Keith Wilson, Early Childhood, and Rehab. Counseling
Appointment Begins: 8/16/2019
PhD from The Ohio State University
Postdoctoral Fellowship, Management Development Institute, Harvard University
Research Area: Rehabilitation Services/Education
College of Engineering

Dr. Shakira Hobbs, Civil Engineering
Appointment Begins: 8/01/2019
PhD from Clemson University
Research Area: Strategic Sustainability Assessment of Enhanced Anaerobic Digestion of Food/Bioplastic Waste

Dr. James Brusuelas, Computer Science
Appointment Begins: 8/01/2019
PhD from the University of California, Irvine
Postdoctoral Fellowship, Papyrology, the Oxyrhynchus Papyri Project, University of Oxford
Research Area: Papyrology, Digital Humanities, Greek/Latin Literature, Greco-Roman Philosophy

Dr. Luis Gonzalo Sanchez Giraldo, Electrical & Computer Engineering
Appointment Begins: 8/01/2019
PhD from the University of Florida
Postdoctoral Fellowship, Computer Science, University of Miami
Research Area: Machine learning, Computational Neuroscience, Computer Vision, and Signal Processing
Blanche Cook, JD  Law Instruction  
Appointment Begin: 5/16/2019  
Juris Doctor from University of Michigan Law School  
Scholar in Residence, Sex Trafficking & Citizenship, University of California, Berkeley Law

College of Medicine

Dr. Daniel Lee, Neuroscience  
Appointment Begins: 7/01/2019  
PhD from Florida A&M University  
Postdoctoral Fellowship, Neuroscience, University of South Florida  
Research Area: Neuroinflammation, Alzheimer’s disease, Parkinson’s disease, Aging, Proteases Inhibitors, etc.
Recruit and retain talent: support for postdoctoral trainees from under-represented groups (I.D.2/3)

• To enhance diversity within the research domain, we offer Lyman T Johnson Postdoctoral Fellowships to support fellows from under-represented groups.

• University Research Postdoctoral Fellowships are offered to support female fellows pursuing advanced research training in under-represented areas (life sciences, engineering, physical sciences).

• Working with the VP for Diversity/Inclusion, and the College of Engineering, we are revising the structure of these program offerings to include a curriculum of career development.

• Meet the current recipients…
Supporting Diversity: Research Postdoctoral Programs

UNIVERSITY RESEARCH POSTDOCTORAL FELLOWSHIP

Dr. Patricia Klein, Mathematics (A&S)
August 2018 - Current
*Commutative algebra, a field of pure mathematics that studies solutions to polynomial equations*

Dr. Kathryn Everson, Biology (A&S)
August 2018 – Current
*Species tree reconstruction in the genomic era: A study of two vertebrate lineages*

Dr. Maggie Sanders, Earth & Environmental Sciences (A&S)
October 2017 – October 2018
*Characterizing the organic and inorganic composition of shale oil reservoirs in the Midland and Appalachian basin*

Dr. Jana Herzberger, Material Engineering (Engineering)
June 2018 – October 2018
*pH-degradable hydrogels for improved control over stem cell localization*
Supporting Diversity: Research Postdoctoral Programs

Lyman T Johnson Postdoctoral Fellowship

Dr. Shaun Hampton, Physics (A&S)
September 2018 – current
*Emergence of spacetime in string theory*

Dr. Ivelisse Robles, Animal and Food Sciences (CAFÉ)
May 2019 – current
*The use of precision dairy farming tools for pain behavior identification and self-medication for cows with mastitis*

Dr. Silver Nyambo, Chemistry (A&S)
March 2017 – December 2018
*Spectroscopic characterization of metal-mediated alkane activation*
III. Improve the research infrastructure

RESEARCH ADMINISTRATION

Jack Supplee
Assoc. Vice President & Executive Director, Fiscal Affairs

Kim Carter
Asst. Vice President & Executive Director, Sponsored Project Administration

Mark Suckow
Assoc. Vice President & Attending Veterinarian

Helene Lake-Bullock
Exec. Director, Office of Research Integrity

Martha Peterson
Sr. Assoc. Vice President for Research, Research Development

Kathy Grzech
Exec. Director, Proposal Development Office

Alicia Gregory
Director, Research Communications**

Rodney Andrews
Assoc. Vice President for Research, Research Innovation

Ian McClure
Exec. Director, Technology Commercialization

William Clark
Director, Research Information Services

Eric King
Federal Relations*

Lisa Cassis
Vice President for Research

Eli Capilouto
President

Center for Clinical & Translational Science
Phil Kern

Markey Cancer Center
Mark Evers

Core Facilities
- Division of Laboratory Animal Resources (DLAR), Flow Cytometry and Immune Function Core, Light Microscopy, Magnetic Resonance Imaging and Spectroscopy Center (MRISC), Proteomics Core Facility, Rodent Behavior Core (RBC)

Centers & Institutes
- Center for Applied Energy Research (CAER), Center for Computational Sciences, Center for Health Services Research, Center for Research on Violence Against Women, Center for Structural Biology, Center of Membrane Sciences, Human Development Institute (HDI), Kentucky Geological Survey (KGS), Kentucky Water Resources Research Institute (KWRI), Survey Research Center, Tracy Farmer Institute for Sustainability and the Environment (SE)

* Reports to University Relations
** Dual reporting to University Relations
Research Infrastructure Improvements

• New leadership and expansion of services within research administrative units
• Data portals and online systems
• Healthy Kentucky Research Building
• Research Core Facilities (II.C.5a, II.C.7a): Through institution-wide equipment competitions (another planned for FY19/20), have brought in $6.25M in new equipment to UK since 2017
Healthy Kentucky Research Building
Cancer – Substance Abuse – Diabetes/Obesity – Cardiovascular/Stroke

Two Floors Complete + Shared Space:
• Shared Conference Rooms & Behavioral Research Suite

• Second Floor:
  • Wet-Labs Diabetes/Obesity
  • Dry-Labs occupied by SUD Data Consortium, HEAL-ing communities faculty and staff

• Third Floor:
  • Wet-Labs occupied by Markey Cancer Center
  • Dry-Labs occupied by the Institute for Rural Health Policy and a Health Equity Cluster
IV. Engagement, translation

• Alignment of CCTS and Markey Cancer Center with the Office of Research, renewal of these programmatic grants (Markey NCI renewal this year, CTSA renewal submitted in April, 2019)

• Support for Kentucky HEAL application to reduce opioid-related deaths in the Commonwealth

• Support for development of the Spirits Institute

• Administrative support for the State-wide EPSCoR program for all institutions of higher education in KY

• Creation of programs to foster intellectual property, commercialization and start-ups across KY (I.B.1, II.A)
Office of the Vice President for Research

Growing with Grants

1. Regional Innovation for Startups & Entrepreneurs
   - NIH NIGMS
   - $3.5M/3 years

2. Commonwealth Commercialization Center
   - THINK KENTUCKY
   - Regional Innovation for Startups & Entrepreneurs
   - $400k/yr for 5 years

3. Commonwealth Commercialization Center
   - THINK KENTUCKY
   - $1.2M/yr for 4 years

Total: $10.3M
### Commercialization Metrics

#### Growing the Opportunity Pipeline

**Capturing More Innovation; Transferring More Technology**

<table>
<thead>
<tr>
<th></th>
<th>FY 2015</th>
<th>FY 2016</th>
<th>FY 2017*</th>
<th>FY 2018**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventions Disclosed</td>
<td>55</td>
<td>53</td>
<td>54</td>
<td>101</td>
</tr>
<tr>
<td>Patents Filed</td>
<td>25</td>
<td>27</td>
<td>39</td>
<td>62</td>
</tr>
<tr>
<td>Licenses Executed</td>
<td>4</td>
<td>7</td>
<td>13</td>
<td>29</td>
</tr>
<tr>
<td>Startups Licensed</td>
<td>6</td>
<td>3</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

*3/4 fiscal year with Director but not full team

**First full FY with full Team
Research metrics: how are we doing?

• Our grant portfolio for FY18/19 is at its strongest!
• This is reflected by national rankings
UK R&D Grant Expenditures:  Strategic Plan Goal = 1.9% increase/year

Source: University of Kentucky OSPA database, 06/30/2018
A Closer Look at R&D Expenditures:
We continue to be a federally funded research enterprise

Source: University of Kentucky, OSPA database.
NIH is the largest source of F&A to the UKRF Budget (FY 2018)

Source: University of Kentucky, OSPA database.
Our Progress thus far in 2018/19: Grant & Contract Award Data
July – April 30th of Each Year

Source: University of Kentucky, OSPA database.
Successful Year for Grant Awards

Even without the HEAL Grant
+ 20.8% Compared to Same Time Last Yr.
+ 1.2% Compared to Full FY 2018

Source: University of Kentucky, OSPA Database, 4/30/2019
Largest NIH Increases from FY 18 to FY 19 YTD
July through April 30th

Source: University of Kentucky, OSPA database.
NIH is not the only federal agency awards that have increased
Other Federal Increases from FY 18 to FY 19 YTD
July through April 30th

Source: University of Kentucky, OSPA database.
UK Strategic Plan Metrics
NCSES HERD R&D Expenditure Survey

In Millions

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>$328.2</td>
</tr>
<tr>
<td>2015</td>
<td>$331.7</td>
</tr>
<tr>
<td>2016</td>
<td>$349.7</td>
</tr>
<tr>
<td>2017</td>
<td>$378.4</td>
</tr>
<tr>
<td>2018 Estimated</td>
<td>$393.0</td>
</tr>
</tbody>
</table>

Source: University of Kentucky, OSPA database.
University Reputation & Rankings

Rankings have increased as our research portfolio expands

**NSF HERD RANKING**

- **62**\textsuperscript{nd}
  - \(\uparrow 2\) (2016)

  Of the 644 institutions surveyed, the University of Kentucky was ranked 62nd, up two spots from 2016.

- **41**\textsuperscript{st}
  - \(\downarrow 0\) (2016)

  UK remained 41st among the 400 public institutions surveyed.

Increase in Ranking of 7 Places in last 5-years

Increase in Ranking of 3 Places in last 5-years
University Reputation & Rankings
Rankings have increased as our research portfolio expands

The Top American Research Universities, 2017
The Center for Measuring University Performance

University of Kentucky

Top 50 Nationally for the first time
Top 25 Public Institution for the first time

Does UK research have an impact?

• **New Awards in 2018/19:**
  - **Seth DeBolt:** National Science Foundation ($3M): a new modeling framework to provide complete picture of genome-phenome relationships applied to the problem of stalk lodging resistance (breaking of the plant stem).
  - **Brent Seales:** Andrew Mellon Foundation ($2M): digital restoration, electronic representation, and computer based open source dissemination of the collection of Herculaneum Papyri held by 4 institutions around the world.
  - **Steve Estus:** NIH ($3.9M): single nucleotide polymorphisms (SNPs) in large genome-wide association studies that are associated with Alzheimer’s disease risk, using these SNPs to develop drug targets for AD treatment.
  - **Sharon Walsh:** NIH ($13.9M): HEALing communities and networks helping end addiction long-term.
  - **Rick Honaker:** DOE ($3.2M): develop and design an efficient processing circuit that can be used to recover high-value rare earth minerals from coal and coal byproducts.
Scholarly Output & Performance: UK SciVal Data
2013-2019 YTD

Overall research performance

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholarly Output</td>
<td>23,629</td>
</tr>
<tr>
<td>Field-Weighted Citation Impact</td>
<td>1.40</td>
</tr>
<tr>
<td>Citation Count</td>
<td>215,902</td>
</tr>
<tr>
<td>Citations per Publication</td>
<td>9.1</td>
</tr>
</tbody>
</table>

Collaboration

<table>
<thead>
<tr>
<th>Metric</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>International collaboration</td>
<td>30.9%</td>
</tr>
<tr>
<td>Only national collaboration</td>
<td>34.4%</td>
</tr>
<tr>
<td>Only institutional collaboration</td>
<td>25.1%</td>
</tr>
<tr>
<td>Single authorship (no collaboration)</td>
<td>9.6%</td>
</tr>
</tbody>
</table>

Performance indicators

- Publications in top 10% most cited worldwide
  - University of Kentucky: 17.0%
  - United States: 16.7%
- Publications in top 10% journals by CiteScore Percentile
  - University of Kentucky: 36.5%
  - United States: 37.3%
- Publications co-authored with institutions in other countries
  - University of Kentucky: 30.9%
  - United States: 32.7%
Sanders Brown Center on Aging: Research that makes a difference

• Dr. Linda Van Eldik, Professor and Director, Sanders Brown Center on Aging, Program Director, NIH P30 Alzheimer’s Disease Center
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

Grants & Contracts Awarded

Helping other units on campus

AD/ADRD supplements:
- Alan Daugherty- Cardiovascular
- Matt Gentry- Metabolism
- Daret St Clair- Cancer
- Olivier Thibault- Diabetes
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

Patient Self-Esteem Maintained

Persons with ADRD

Caregiver Burden Reduced

Caregivers

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.
Example: Research on Late Life AD Mimics

**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
MCI-CVD and Biomarkers of VCID

U19 Consortium $39M Application Submitted with UK as Coordinating Center

**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.
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

Stratified medicine

Stratification
Patients are grouped by: Disease, Subtypes, Demographics, Clinical features, Biomarkers

Personalisation
Patient individual: Preferences, Clinical features, Medication history, Environment, Behaviours & habits, Biomarker

Where Sanders-Brown will take the dementia field

Precision medicine
Racing to defeat dementia

Sanders-Brown Center on Aging
UK R&D expenditures annually: the basis for the UKRF budget

Source: University of Kentucky OSPA database, 06/30/2018
UKRF budgeting: how to decide on projected F&A income for budgeting purposes?

- % increase in expenditures
- % increase in UKRF budget

% change

0 0 0 0 0 0 14%

UKRF Budget

• For FY18/19, we budgeted $50 million based on F&A income from FY17/18.
• 2019/20 Proposed Budget: $57 million of F&A income, representing an 14% increase.
Page 1: Revenues (major changes)

• II.B. Private Gifts: Reduction of $91,750
• IV. Appropriated fund balance, unrestricted
  • A. Royalty Income Unexpended Balance: $127,100
  • B. Faculty Research Program: $6 million (fund balance difference)
  • C. Miscellaneous: -$2,191,560
  • D. Contingency Reserve: Increase of $700K (10% of UKRF $57 million budget).
  • E. Healthy Kentucky Research Building: increase of $3,100,000
Page 2: Transfers to General Fund (major changes)

• 1.A.2. Service Assessment: +$115,700
• 1.A.7. Research Financial Services: +$75,000
• 1.B. Research Admin/Personnel Support: +$704,500
• 1.B.2. College Grant Officers: +$126,100
• 1.B.3. Office of Technology/Commercialization: +$141,000
• 1.E. Debt service:
  • Lee T. Todd internal loan: $3,924
  • Biopharm 5th floor, +$2,200
  • Healthy Kentucky Research Building Internal Loan Debt Service, +$465,816
Page 3: Expenditures (major changes)

• II.A. Operating expenses of research units: +$429,900
• II.B. Other activity: +$718,450
• II.C. Research Programs: +$11,575,100
Page 3: Expenditures, Research Programs

- IIC.1a Residual start-up (-$2,456,400): Remaining commitments
- IIC.1b Faculty start-up ($1,400,000): 20% of this year’s budget
- IIC.2a. Enrichment ($987,100): Increased based on increased funding
- II.C.2b. Research Activity Award ($201,300): 5% of this year’s budget
- II.C.2c. 2% to Academic Home ($181,400): additional F&A return to units
- IIC.4a. Grant related support ($647,500): new programmatic grants.
- IIC.6a. University-wide Initiatives ($24,200): additional support for workshops on good research practices, data handling
- II.C.7a. Research Strategic Investment fund ($1,000,000): upcoming equipment competition, additional support for start-up for diversity hires
- II.C.7b. Research Priority Areas ($490,000): 7% of this year’s budget
- II.C.8a. Research Programs Fund Balance carryforward ($6,000,000)
- II.C.9a. Healthy Kentucky Research Building ($3,100,000): animal cages and racks