2019-2020 Research Report to UKRF Board of Directors

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Vice President for Research
Format

• Overview of the Research Mission: Progress on Research Grants and Contracts, Scholarly Activity, National Rankings
• Strategic Investment in Programs and Equipment
• COVID-19: Impact on Research and Our Response
• Presentation of FY20/21 budget
UK: A Research 1 University

- **Carnegie Classification:**
  - Doctorate-granting university: *Very high research activity*
  - Research activity is defined by:
    - R&D expenditures in science and engineering (S&E)
    - R&D expenditures in non-S&E fields
    - S&E research staff (postdoctoral appointees and other non-faculty research staff with doctorates)
    - Doctoral conferrals in humanities, social science, STEM fields, and other fields.
  - These 4 measures are combined using principal component analysis to create 2 indices of research activity, one that is an aggregate of research activity and the other representing per-capita research activity. If you are high on both indices you are classified as R1.
Our Research Mission

• Conduct research and creative work that benefits those of the Commonwealth, and the world.

• Train the next generation of innovators within our field of study.

• By virtue of these activities, disseminate findings through scholarly activity (publish or perish).

• Seek extramural support for our research and creative work, including support for salaries of faculty, staff and students within research and creative programs.
The Process for Extramural Research Grants and Contracts and Relationship to the UKRF Budget

An idea

Office of Sponsored Research Administration, Proposal Development Office

Office of Research Integrity, Institutional Animal Care and Use Committee

Federal Granting Agency

Peer Review

Direct costs to support specific studies $1.00

Facilities and administrative (F&A) costs to support the research infrastructure (UKRF Budget) $0.53

Funding of Project
The UKRF Budget Supports the Research Infrastructure
Improvements within our research infrastructure have positively impacted extramural grants and contracts.
UK R&D Grant Expenditures: Strategic Plan Goal = 1.9% increase/year. Prior to 2015, R&D expenditures had declined by -13% (FY13/14) and -4% (FY14/15)

Source: University of Kentucky OSPA database, 06/30/2019
UK Researchers Compete for Federal Peer-Reviewed Funding

Source: University of Kentucky, OSPA database.
Federal funding, such as funding from the National Institutes of Health (NIH) provides the largest source of F&A to the UKRF Budget (FY 2019)

Direct Expenditures ($)
Indirect Expenditures ($)

NIH 50.9%
Other Federal 27.3%
Other Sponsors 8.0%
State 1.4%
NSF 5.4%
DOE 3.6%
USDA 1.5%
DOD 1.9%

Source: University of Kentucky, OSPA database.
Grant awards thus far in 2019/20: Extramural funding continues to increase at UK after a record-breaking year
July – April 30th of Each Year

Source: University of Kentucky, OSPA database.
Increased federal grant awards thus far in FY19/20

**SPONSORED AWARD DOLLARS BY TYPE**

*Compared to the Same Time Last Year*

Federal Awards + 13.2%

State Awards - 17.1%

Industry Awards - 2.0%

Other Award Sponsors + 24.5%

Source: University of Kentucky, OSPA Database, 4/30/2020
Increased Extramural Grants and Contracts 
Improve our National Rankings (as an R1 University)
UK Strategic Plan Metrics
NCSES HERD R&D Expenditure Survey

University Reputation & Rankings
Rankings have held as our research portfolio expands

NSF HERD RANKING

63rd Nationally

41st Public Institutions

The Top American Research Universities, 2018
The Center for Measuring University Performance

University of Kentucky
Top 50 among Public Institutions

Other metrics or criteria that we track to illustrate productivity and impact of our research mission
## Patents, Licenses, and Start-ups: 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>
<th>FY 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INVENTIONS DISCLOSED</strong></td>
<td>55</td>
<td>53</td>
<td>54</td>
<td>101</td>
<td>104</td>
</tr>
<tr>
<td><strong>PATENTS FILED</strong></td>
<td>25</td>
<td>27</td>
<td>39</td>
<td>62</td>
<td>85</td>
</tr>
<tr>
<td><strong>LICENSES EXECUTED</strong></td>
<td>4</td>
<td>7</td>
<td>13</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td><strong>STARTUPS LICENSED</strong></td>
<td>6</td>
<td>3</td>
<td>8</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: UK Office of Technology Commercialization

- **100%**
- **300%**
- **400%**
Scholarly Output & Performance: UK SciVal Data
2013-2020 YTD

Overall research performance

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholarly Output</td>
<td>18,788</td>
</tr>
<tr>
<td>Field-Weighted Citation Impact</td>
<td>1.45</td>
</tr>
<tr>
<td>Citation Count</td>
<td>230,365</td>
</tr>
<tr>
<td>Citations per Publication</td>
<td>12.3</td>
</tr>
</tbody>
</table>

Collaboration

<table>
<thead>
<tr>
<th>Metric</th>
<th>Field-Weighted Citation Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>International collaboration</td>
<td>31.1%</td>
</tr>
<tr>
<td>Only national collaboration</td>
<td>38.5%</td>
</tr>
<tr>
<td>Only institutional collaboration</td>
<td>20.6%</td>
</tr>
<tr>
<td>Single authorship (no collaboration)</td>
<td>9.8%</td>
</tr>
</tbody>
</table>

Performance indicators

- Publications in top 10% most cited worldwide:
  - University of Kentucky: 16.4%
  - United States: 15.8%
- Publications in top 10% journals by CiteScore Percentile:
  - University of Kentucky: 36.1%
  - United States: 36.5%
- Publications co-authored with institutions in other countries:
  - University of Kentucky: 31.1%
  - United States: 32.9%
Strategic Investment in Programs within the UKRF Budget
Supporting Diversity: URM Research Postdoctoral Programs

UNIVERSITY RESEARCH POSTDOCTORAL FELLOWSHIP

Dr. Kathryn Everson, worked with UK Biology
August 2018 – Current
Species tree reconstruction in the genomic era: A study of two vertebrate lineages

Dr. Abigail Folberg, working with UK Psychology
August 2019 – Current
“You Can’t Tell Other People What to Believe”: The role of tolerance of sexism in legitimizing gender inequality

Dr. Jennifer Kenkel, working with UK Mathematics
August 2019 – Current
Local cohomology modules of thickenings of determinantal rings

LYMAN T JOHNSON POSTDOCTORAL FELLOWSHIP

Dr. Shaun Hampton, works with UK Physics
September 2018 – current
Emergence of Spacetime in String Theory

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

New 2020 In-coming Post Docs
Shemka Thorpe, working with UK School Counseling Psychology
Brandon Wilson, working with UK History
Juana Zamora-Reyes, working with Molecular and Cellular Biochemistry
Strategic Investment: Development of an Inclusive Postdoctoral Enrichment Program (IPEP) for URM Postdocs

- Program components:
  - Personal navigation through the University System
  - Enrichment sessions:
    - Weekly lunch and learn sessions
    - Quarterly breakout sessions tailored to fellow’s specific needs
  - Social & educational offerings via the Office of Institutional Diversity, Society for Postdoctoral Scholars, & Office of Faculty Advancement
  - Career development panel with mentor(s), department chair, Associate Dean for Research, relevant faculty
  - Networking opportunities with national leaders through speaker invitations
  - Enhanced mentor training
Strategic Investment in Programs: Research Priority Areas that have an impact on the Commonwealth

- Six Research Priority Areas identified based on criteria of significance of the problem, existing strength, disciplinary diversity, sustainability, economic impact
- These areas, using a standard template, developed governance, membership, goals and objectives
- Funds provided to support initiatives within these programs, including strategic recruitment of faculty, equipment, student support, research symposia/seminars
Strategic Investment in Programs: Research Priority Areas that have an impact on the Commonwealth

New developments through this program:

- Competitive faculty recruitment & targeted hires in all six areas
- Seed grant programs
- Creation of bio-banks
- Website development & infrastructure
- Multiple symposia held
- Funded administrative positions (e.g., clinical research coordinators)
- Purchase of specialized equipment for shared use
- Expanding collaboration networks and capacity
Designation of these research priorities is positively impacting grant contracts and awards

Fiscal Year 2015 through 2019

Cancer: CAGR = 4.3%
Diabetes & Obesity: CAGR = 5.7%
Cardiovascular: CAGR = 2.4%
Substance Abuse: CAGR = 25.5%
Neuroscience: CAGR = 18.4%
Energy: CAGR = -0.3%

Note: Awarded projects for each thematic area are not mutually exclusive. Projects may be represented in one or more areas. Additionally, projects 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. Source: UK OSPA Database
HEALing Communities Study

$87 million award from NIH

The aim is to reduce opioid overdose deaths by 40% in highly affected communities by scaling up and deploying an integrated set of evidence-based practices in partnership with community coalitions to:

- Increase access to overdose training and naloxone
- Increase access to medications for opioid use disorder
- Decrease high risk opioid prescribing

Progress on implementation:
- 55 hiring proposals submitted
- Created 47 positions
- 1,000 applicants reviewed
- 300 interviews conducted
- 42 positions filled to date
Strategic Investment in Facilities: Healthy Kentucky Research Building
Cancer – Substance Use Disorder – Diabetes/Obesity – Cardiovascular/Stroke

Two Floors Occupied:
• Second Floor:
  • Wet-Labs occupied by Diabetes/Obesity Researchers
  • Dry-Labs occupied by SUD Data Consortium and Substance Use Disorder Research Priority Area (including HEALing Communities researchers)

• Third Floor:
  • Wet-Labs occupied by Markey Cancer Center
  • Dry-Labs occupied by the Institute for Rural Health Policy, a Health Equity Cluster, and Center for Population Health
Strategic Investment in Facilities: Healthy Kentucky Research Building
Cancer – Substance Use Disorder – Diabetes/Obesity – Cardiovascular/Stroke

Phase II Completed this Summer:
• Fourth Floor:
  • Wet-Labs with 18 lab benches
  • Dry-Labs 13 faculty offices + staff areas

• Fifth Floor:
  • Wet-Labs with 18 lab benches

NIH C06 Construction Grant:
• First Floor Fit-out:
  • Wet-Labs with 12 lab benches
  • Construction and architecture teams working with the NIH on design and plans for construction

Remaining Space for Phase III Include:
1. Sixth Floor Wet-Labs
2. First & Second Floor Conference/Seminar Room
3. Imaging Suite on Lower-Level
Strategic Investment: Revitalizing and modernizing research equipment

Equipment Competition:
Investment Since 2017
$10.2 M Total Equipment across campus
COVID-19 and Research

We are not immune to this terrible pandemic, but research is, and will be a powerful vehicle to develop solutions.
Timeline of events

**March 9**
EOC workstream focused on research is added to existing workstreams, and Martha Peterson (Senior Associate Vice President for Research) is appointed as research lead.

**March 11**
President announces the suspension of on campus courses. VPR communicates separately regarding research.

**March 12**
Vice President for Research (VPR) issues campus email that research is continuing, with all staff offices fully operational.

**March 15**
VPR issues campus email suggesting that investigators identify essential on campus research operations and move to remote operations. All research staff units are moved to remote operations.

**March 17**
VPR issues campus email stating that research is not suspended and staff offices remain open (but through remote working operations). A website is created that includes links and frequently asked questions.

**March 18**
Additional training on responsible conduct of research is rolled-out to campus to promote remote research activities.
COVID-19 Research Response Timeline

March 20
VPR issues campus email detailing human subjects research operations during COVID-19 pandemic. Creation of website offerings detailing information with relevant links. First CURE COVID-19 Alliance team developed under supervision of Dean Robert DiPaola and VPR Lisa Cassis.

March 24
VPR convenes Associate Deans for Research and Staff Unit Directors for weekly meeting to discuss operations during COVID-19.

April 9
VPR issues campus email describing new website for COVID-19-related technology development.

April 10
VPR commissions 2nd CURE COVID-19 Alliance focused on materials, led by Brad Berron (Engineering).

April 17
VPR commissions 3rd CURE COVID-19 Alliance focused on research dealing with social science aspects of COVID-19. Further definition of essential on campus research defined through campus email, including requirement for approved waiver.

April 17
Formation of working group to plan for gradual reopening research operations.

May 18
Draft for Resumption of Research, FAQ for resumption of clinical/human subjects research, and online form for individual PI workspace plans submitted to EOC.
COVID-19 Impact on Research Finances:

- Salaries plus benefits paid from extramural grants and contracts to research personnel, working remotely, are approximately **$17.3M/month**, totaling **$52M** through the end of FY2019-20. While these salaries are still being paid, much of the funded research cannot be performed as described.

- Research and development (R&D) expenditures on grants and contracts declined by 12% in March. As a result, facilities and administrative (F&A) costs that are reimbursed by funding agencies have also declined, representing a **$4.2M reduction** in this income source through the end of FY2019-20.

- However, our research enterprise continues to flourish and will be needed more than ever to develop solutions to the pandemic.
COVID-19 and Research: Our Response, Website Materials, Policies and Procedures

- We have developed website materials to guide and instruct investigators on research activities during the pandemic:
  - General information related to COVID-19, including information on humans subjects and animal research, frequently asked questions, and links to national resources related to the pandemic ([https://www.research.uky.edu/resources/covid-19-guidance-researchers](https://www.research.uky.edu/resources/covid-19-guidance-researchers))
  - Innovation and discovery related to COVID-19 ([https://www.research.uky.edu/otc/covid19](https://www.research.uky.edu/otc/covid19))
COVID-19 and Research: Our response, giving our PPE to UKHC

- Laboratories across campus use gloves, masks and other forms of Personal Protective Equipment (PPE) to ensure safety of employees
- Because of shortages, we coordinated collection of these materials that were then donated to UKHC
COVID-19 and Research: Our response, standing up research CURE Alliance groups to develop solutions to the pandemic

- Stood up three COVID-19 Unified Research Expert (CURE) Alliances to support COVID-19 research
  - Biomedical Research (Becky Dutch, College of Medicine)
  - Materials and Methods (Brad Berron, College of Engineering)
  - Social Sciences (Julie Cerel, College of Social Work)
- **Purpose:**
  - To develop solutions for COVID-19-related problems at UK and in the Commonwealth,
  - To facilitate research development across disciplines addressing SARS-CoV-2 and COVID-19,
  - To coordinate research on the pandemic
  - To develop projects towards federal funding opportunities.
- Providing financial support for pilot projects, reagents and resources
HEALing Communities Study: Progress During COVID-19

- HEAL team has continued working with our 8 Wave 1 Community Coalitions with over 40 in-person or Zoom meetings since 1/20

- Accelerated the plan to provide overdose education and naloxone distribution initially targeting the jails (currently shipping to Kenton, Clark, Fayette, Franklin and Boyle)

- Now partnering with syringe service programs, treatment and recovery programs and Quick Response Teams to distribute naloxone and training

Opioid overdoses are increasing in Kentucky in the context of COVID-19

Increased urgency to scale up interventions due to greater risk for overdose and stretched resources in public health depts.
## Impact of COVID on Research Admin Units

### Service metrics % Increase from same time last year (March & April)

*Note: Bars are not to scale, they are provided for illustration purposes only.*

<table>
<thead>
<tr>
<th>Service Area</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPA Actions (PADRS)</td>
<td>+ 4.9%</td>
</tr>
<tr>
<td>OSPA Proposal Submissions</td>
<td>+ 19.9%</td>
</tr>
<tr>
<td>ORI Service Requests</td>
<td>+ 6.9%</td>
</tr>
<tr>
<td>PDO Service Requests</td>
<td>+ 48.0%</td>
</tr>
<tr>
<td>IP Disclosures</td>
<td>+ 142%</td>
</tr>
<tr>
<td>OTC Activity</td>
<td>Significant in all areas</td>
</tr>
<tr>
<td>Animal Protocols</td>
<td>+ 200%</td>
</tr>
<tr>
<td>Research IT Tickets</td>
<td>+ 53.6%</td>
</tr>
<tr>
<td>Research Communications</td>
<td>+ 300%</td>
</tr>
</tbody>
</table>
COVID-19 and Research: The Future, Funding Opportunities

- PHASE 3 - Coronavirus Aid, Relief and Economic Security Act (CARES):
  - Department of Energy/Office of Science: $95M
  - National Institutes of Health: ($945.5M)
  - Substance Abuse and Mental Health Services Administration: ($425M)
  - National Science Foundation: ($76M)

- PHASE 3.5– Interim Emergency Coronavirus Relief, formally titled “Paycheck Protection Program and Health Care Enhancement Act” (HR 266):
  - National Institute of Health: $1.8 billion
    - This measure doubles the amount that Congress has appropriated for NIH for COVID-19 purposes so far.
  - We are aligning our CURE groups towards these and other funding opportunities.

- PHASE 4: Possible inclusion of funds to sustain ongoing research that was curtailed.
  - Currently under consideration by Congress
  - We have advocated with members in our delegation
COVID-19 and Research: The Future, Resumption of Research

• More than ever research is needed to address the pandemic and prepare for the future in this new reality
• Unfortunately, our current ability to harness the full UK research enterprise is curtailed
• We have allowed COVID-19 related research to continue under specific guidelines
• Our goal: Resume research as soon as possible
• Toward this goal, we established a working group to plan for resumption of normal (or new normal) research
• The underlying principles are to resume research operations using approaches that protect personnel and minimize exposures
• A draft plan for phased resumption of research has been submitted to the Emergency Operations Center, with a request to move from phase 1 (essential research only) to phase 2 (30—50% research activity)
COVID-19 and Research: The Future, Learning from the Pandemic

- Changes in organization around personnel activities within laboratories and in staff administrative offices
- Changes in how we do things in our research programs
- Proactive approaches to research and development in emerging areas
- Partnering with state and industry to quickly actualize innovations
- Spearheading collaborations between UKHC and researchers across the institution
UKRF Budget

• For FY19/20, we budgeted $57M of anticipated F&A income, representing a 14% increase from the previous year because of growth in extramural grants and contracts.

• FY20/21 Proposed Budget: $59M (a 3.5% increase)
Page 12 within your packet, Budget Summary

• Total Revenue: $149,029,540, representing an increase of $31,871,990

• Transfers and Expenditures:
  • Transfer of $28,323,500 to the institution, an increase of $212,300
  • Expenditures of $120,706,040, an increase of $31,659,690
Page 13 within packet, Transfers to General Fund (major changes)

- A.2. Service assessment, +$48,600
- A.7. Research Financial Services, +$16,500 (part of a HEAL financial administrator position)
- No change in research staff personnel, student training
- E. Debt Service
  - Completed payment of internal loan for fit-up of floors 4 and 5 of Biopharm
  - HKRB: +$825,144
  - Overall change: +$147,200, making debt service 7% of the overall budget
Page 14 within packet, Expenditures

• A, Operating Expenses, Research Administration
  • A.2. Research Information Services: +$260,000 for site license software (e.g., Electronic Lab Notebook, eSirius upgrade, PURE, etc)
  • A.5. Office of Technology Commercialization: +$12,250 (to offset budget cuts to general funds within this unit)
  • A.8. Office of the Attending Veterinarian: +$28,400 (fund balance for service on IACUC)
  • A.14. Office of Research Integrity: +$34,400 (fund balance for service on IRB)
Page 14 within packet, Expenditures

- IIC. Research Programs
  - 1a. Formulaic start-up: +$400,000 (20% of UKRF budget)
  - 1b. Other Start-up commitments: +$967,800 (Dean’s packages, etc)
  - 2a-c. Formulaic incentive return programs to colleges/centers: +$3,162,900 (45% of overall budget)
  - 5a. Shared Use Facilities: +$100,000 (new Director of a Core Facility)
  - 6a. University Wide Initiatives: +$174,500 (clinical aging space)
  - 7b. Research Priority Areas: +$140,000 (7% of overall budget)
  - 8a. Fund Balance Carryforward Estimate: +$16,000,000 (fund balance across departments, colleges and centers)
Page 14 within packet, Expenditures

9. Capital Project Investments
   a. HKRB: -$100,000 (additional $5M is for commitment to NIH C06 Construction grant for fit-up of first floor, imaging core)
   b. 845 Angliana Avenue: +$8,000,000 (CDAR/HEAL)
   c. Sanders Brown Capital Construction Grant Match: +$2,000,000 (a second NIH C06 pending grant)