

2019-2020 Research Report to UKRF Board of Directors

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Sciences**

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

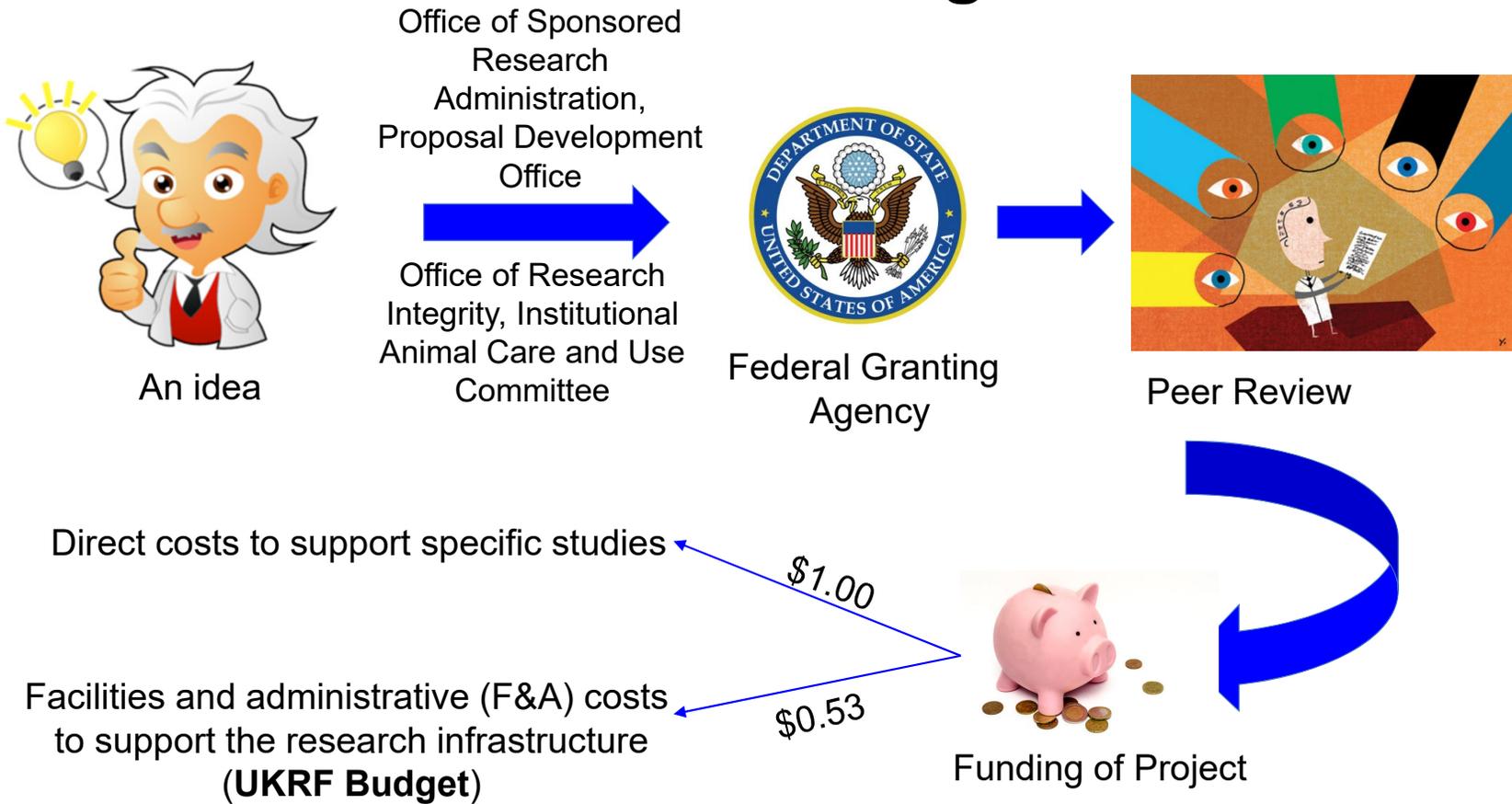
- Carnegie Classification:
 - Doctorate-granting university: **Very high research activity**
 - Research activity is defined by:
 - R&D expenditures in science and engineering (S&E)
 - R&D expenditures in non-S&E fields
 - S&E research staff (postdoctoral appointees and other non-faculty research staff 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.

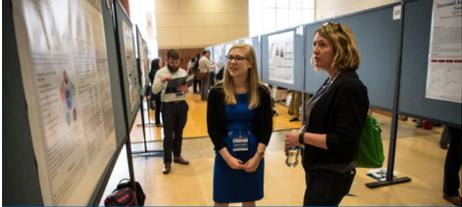
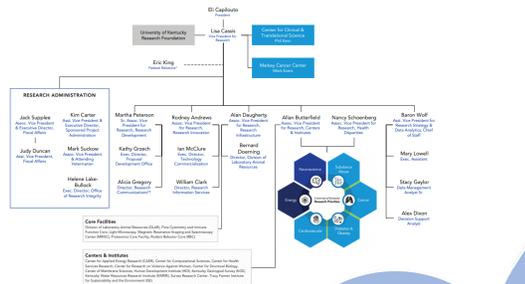


The Process for Extramural Research Grants and Contracts and Relationship to the UKRF Budget





The UKRF Budget Supports the Research Infrastructure



Annual Center for Clinical and Translational Science Conference
Focuses on Moving Discoveries to New Interventions for Health

Centers and Institutes

Core Facilities

Office of Research

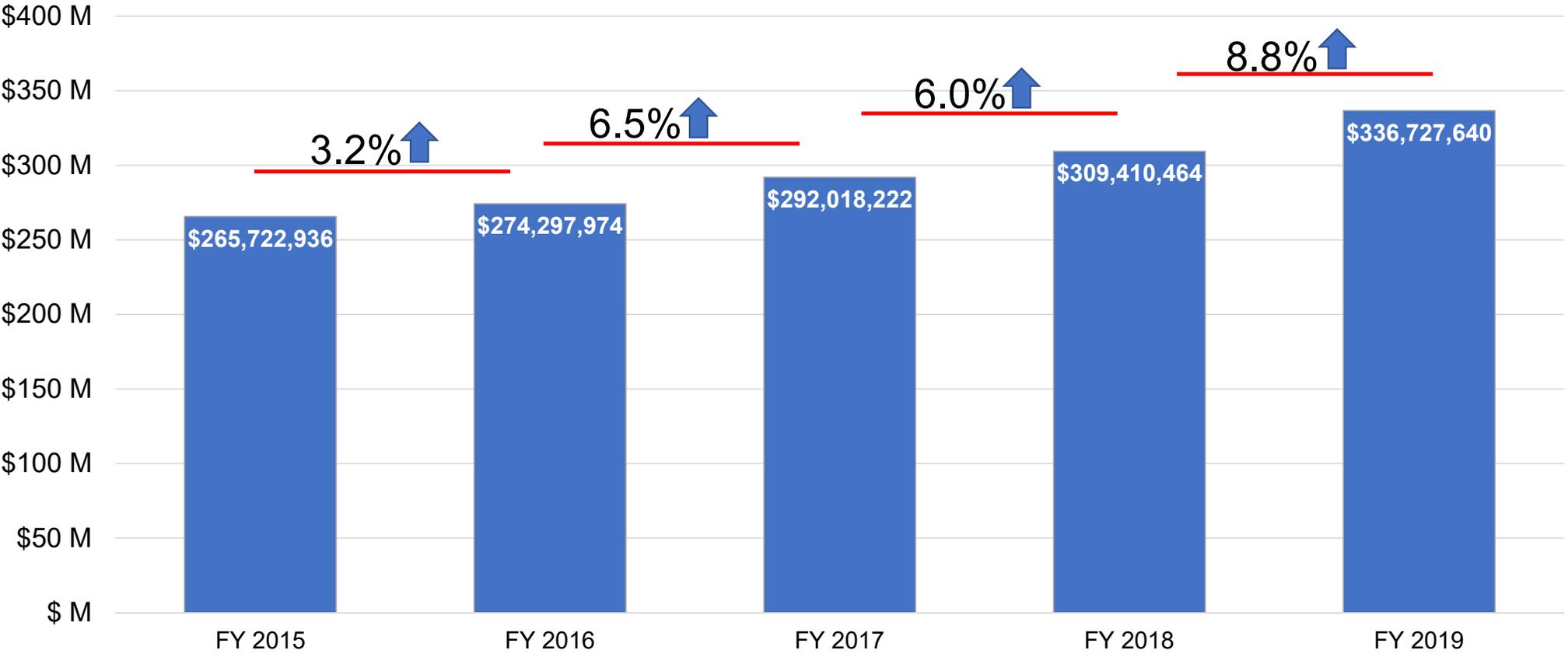
Research Compliance

Research Administration



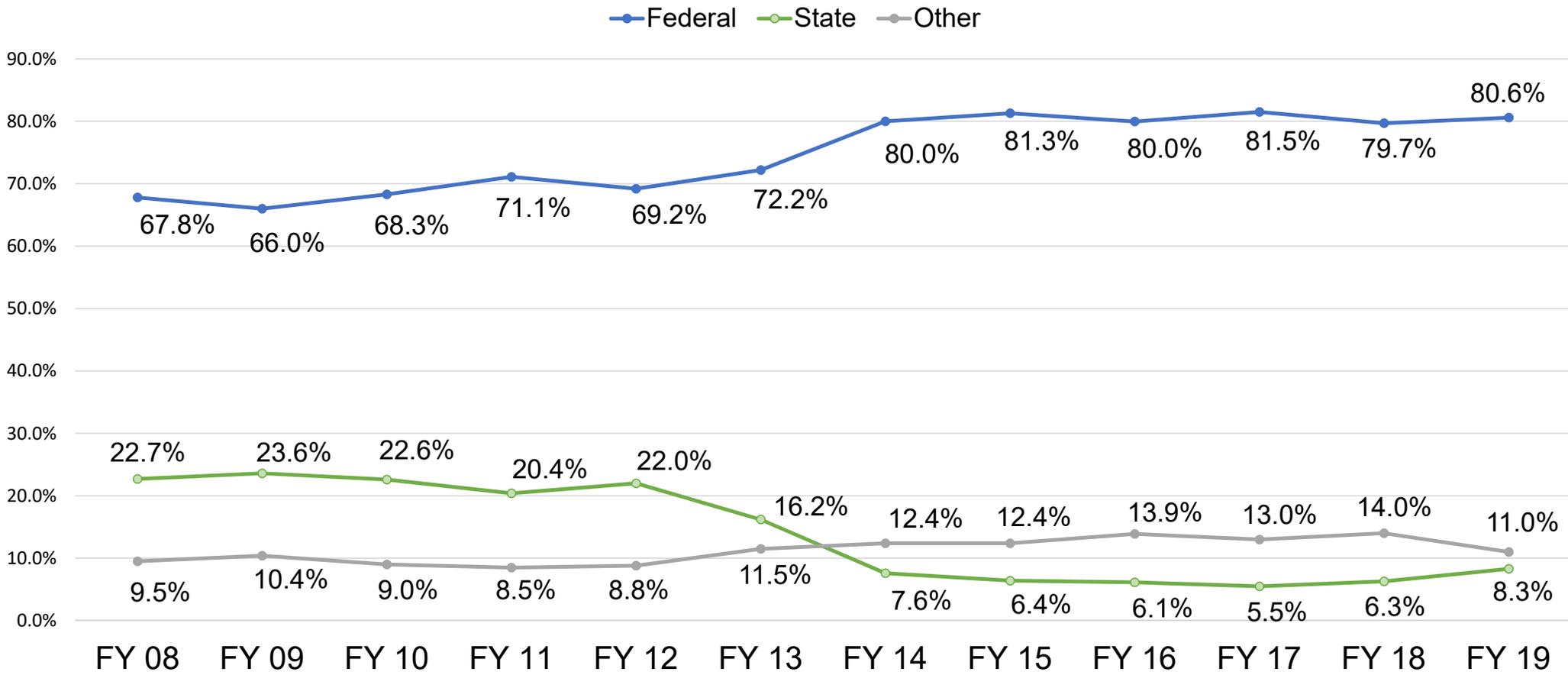
Improvements within our research infrastructure have positively impacted extramural grants and contracts

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)*



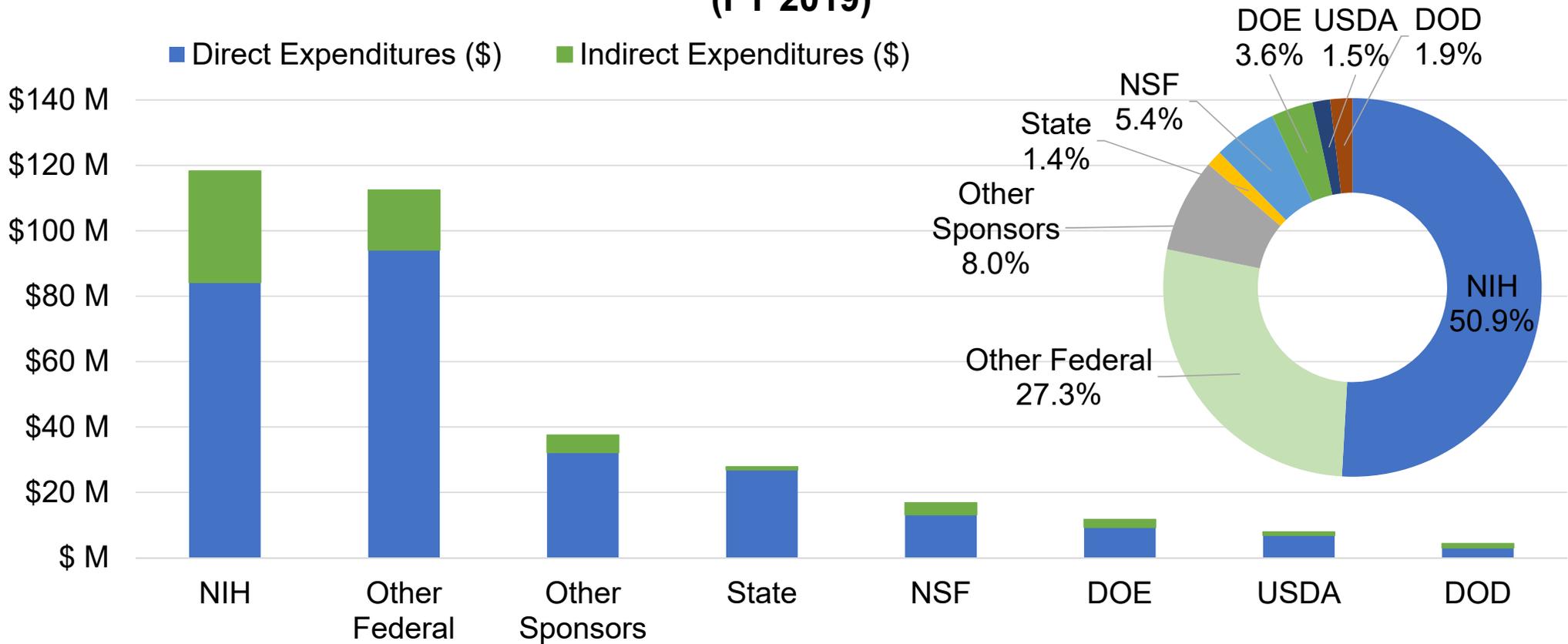
Source: University of Kentucky OSPA database, 06/30/2019

UK Researchers Compete for Federal Peer-Reviewed Funding



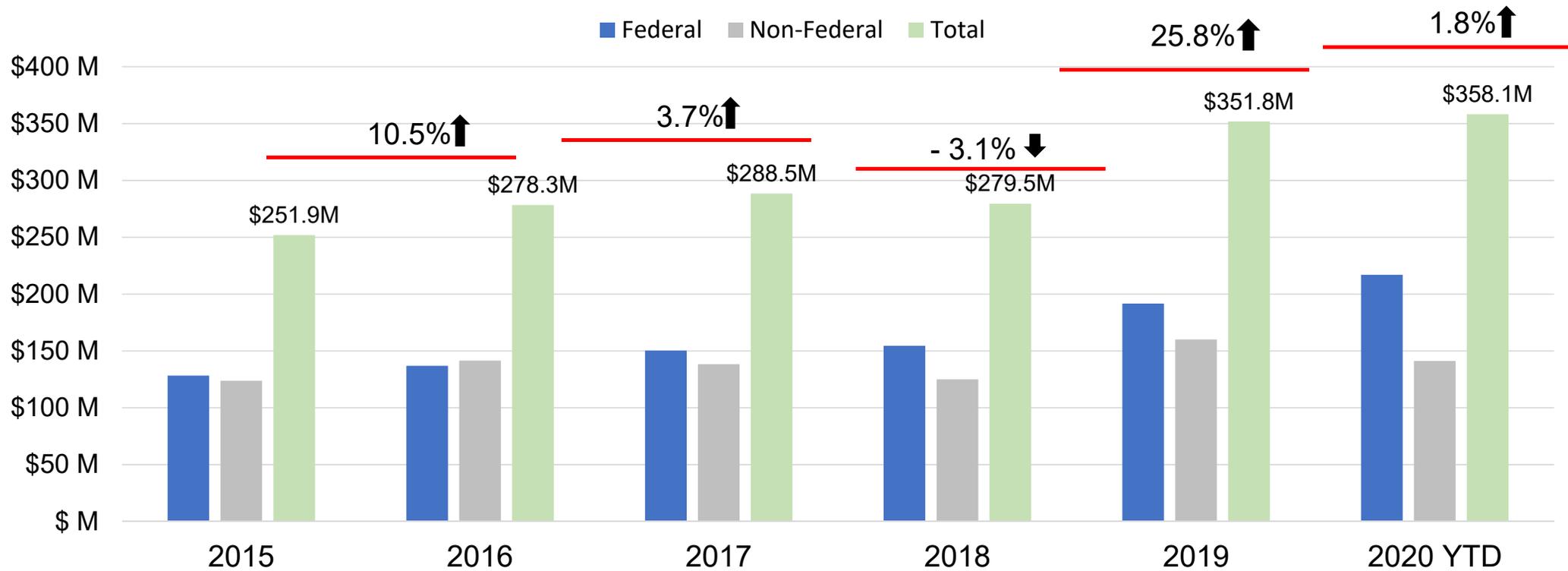
Source: University of Kentucky, OSPA database.

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)



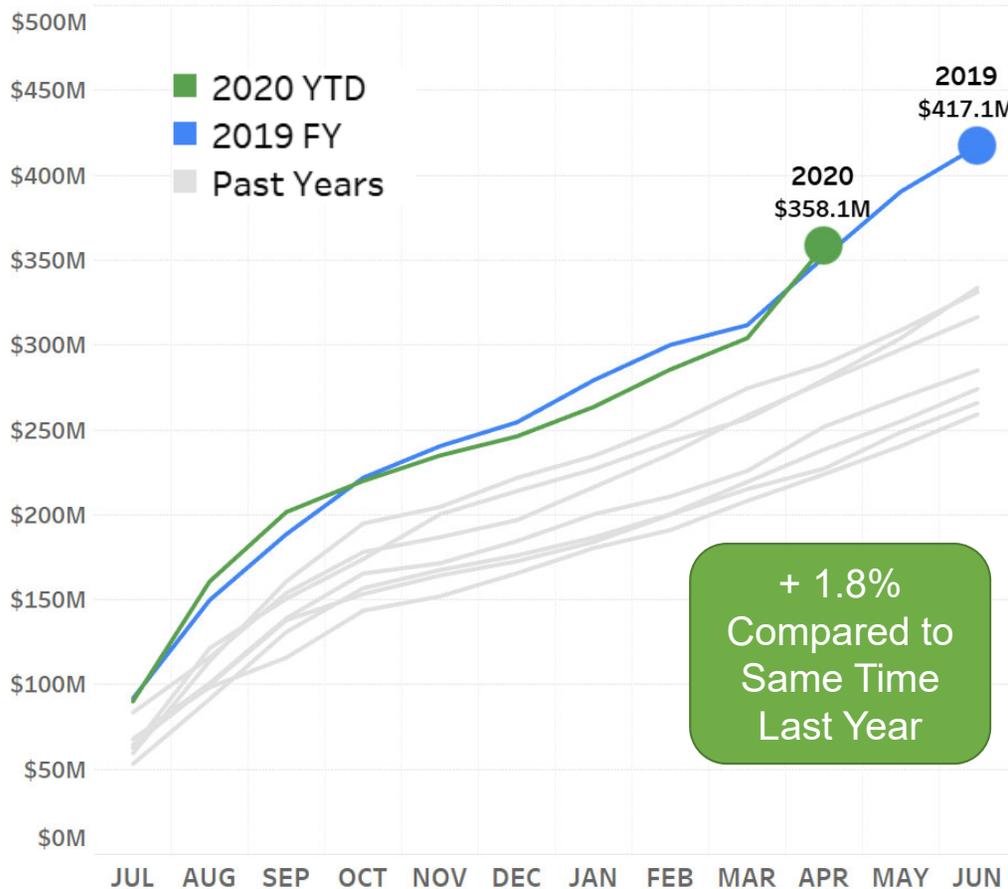
Source: University of Kentucky, OSPA database.

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%

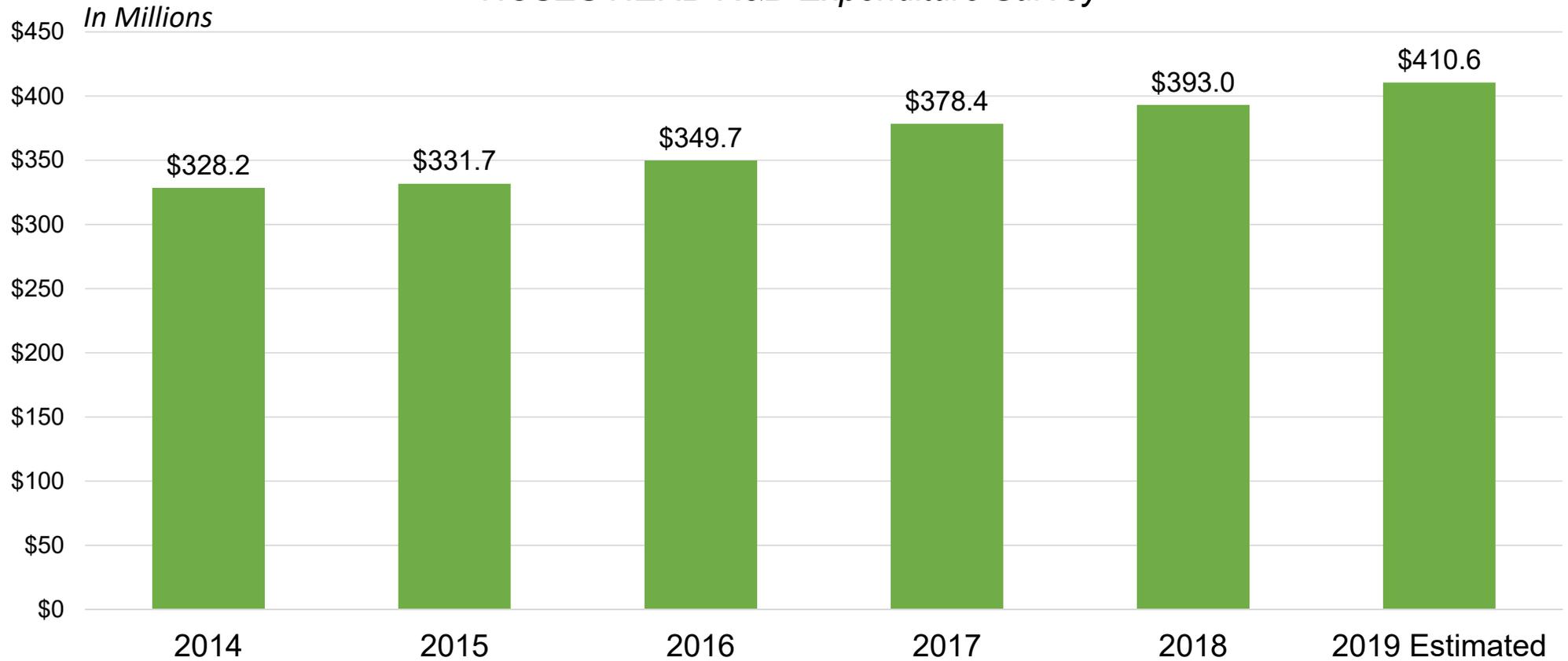
Other Award Sponsors + 24.5%

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



Source: National Science Foundation, National Center for Science and Engineering Statistics (NCSES), Higher Education Research & Development (HERD) Survey, FY2019. <http://ncesdata.nsf.gov/herd/>

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

Source: National Science Foundation, NCSES, HERD Survey, FY2019. <http://ncesdata.nsf.gov/herd/> and https://mup.umass.edu/sites/default/files/annual_report_2018.pdf

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

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	
INVENTIONS DISCLOSED	55	53	54	101	104	↑ 100%
PATENTS FILED	25	27	39	62	85	↑ 300%
LICENSES EXECUTED	4	7	13	29	30	↑ 400%
STARTUPS LICENSED	6	3	8	10	8	

Source: UK Office of Technology Commercialization

Scholarly Output & Performance: UK SciVal Data

2013-2020 YTD

Overall research performance

18,788 ▲

Scholarly Output ⚙️

230,365

Citation Count ⚙️

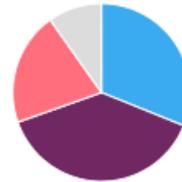
1.45

Field-Weighted Citation Impact ⚙️

12.3

Citations per Publication ⚙️

Collaboration ⚙️



Metric

Field-Weighted Citation Impact

Metric	Percentage	Field-Weighted Citation Impact
International collaboration	31.1%	2.06
Only national collaboration	38.5%	1.31
Only institutional collaboration	20.6%	1.06
Single authorship (no collaboration)	9.8%	0.82

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

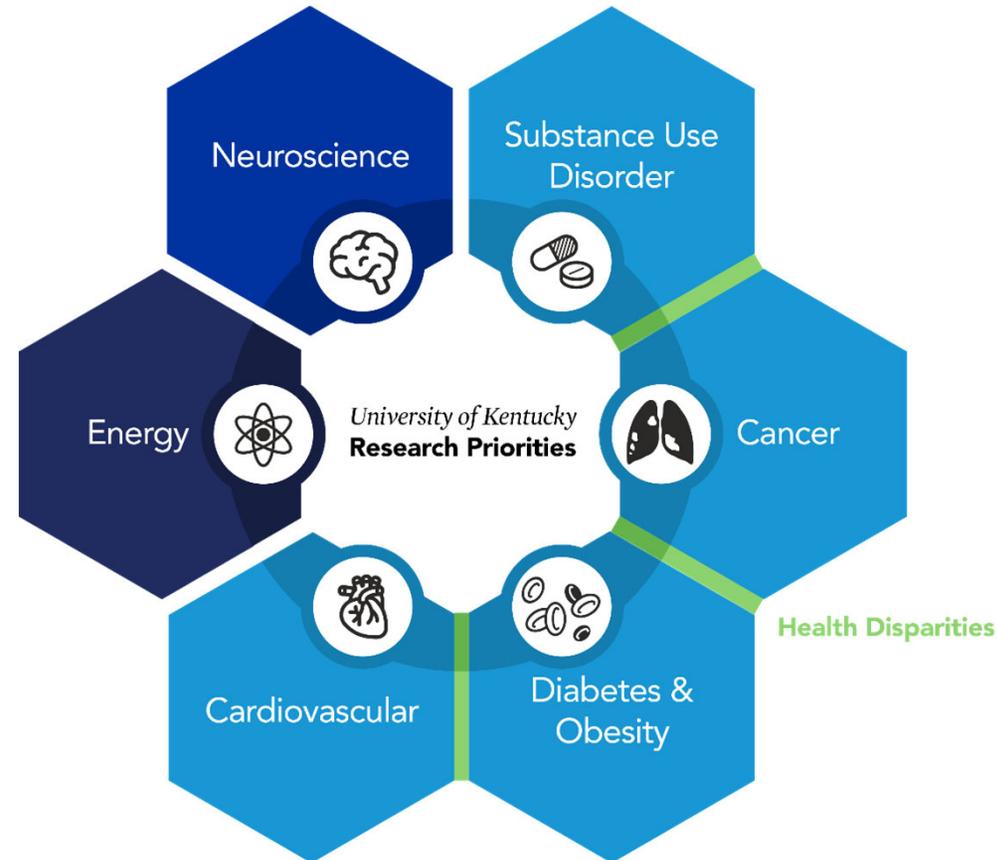
Juana Zamora-Reyes, working with Molecular and Cellular Biochemistry

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

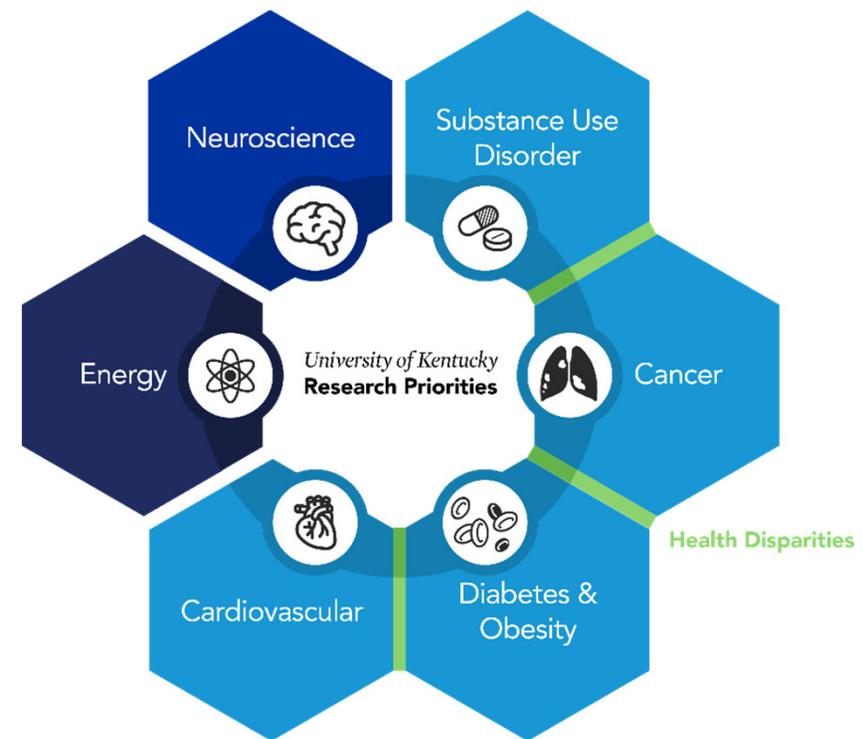


- Six Research Priority Areas identified based on criteria of significance of the problem, existing strength, disciplinary diversity, sustainability, economic impact
- These areas, using a standard template, developed governance, membership, goals and objectives
- Funds provided to support initiatives 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

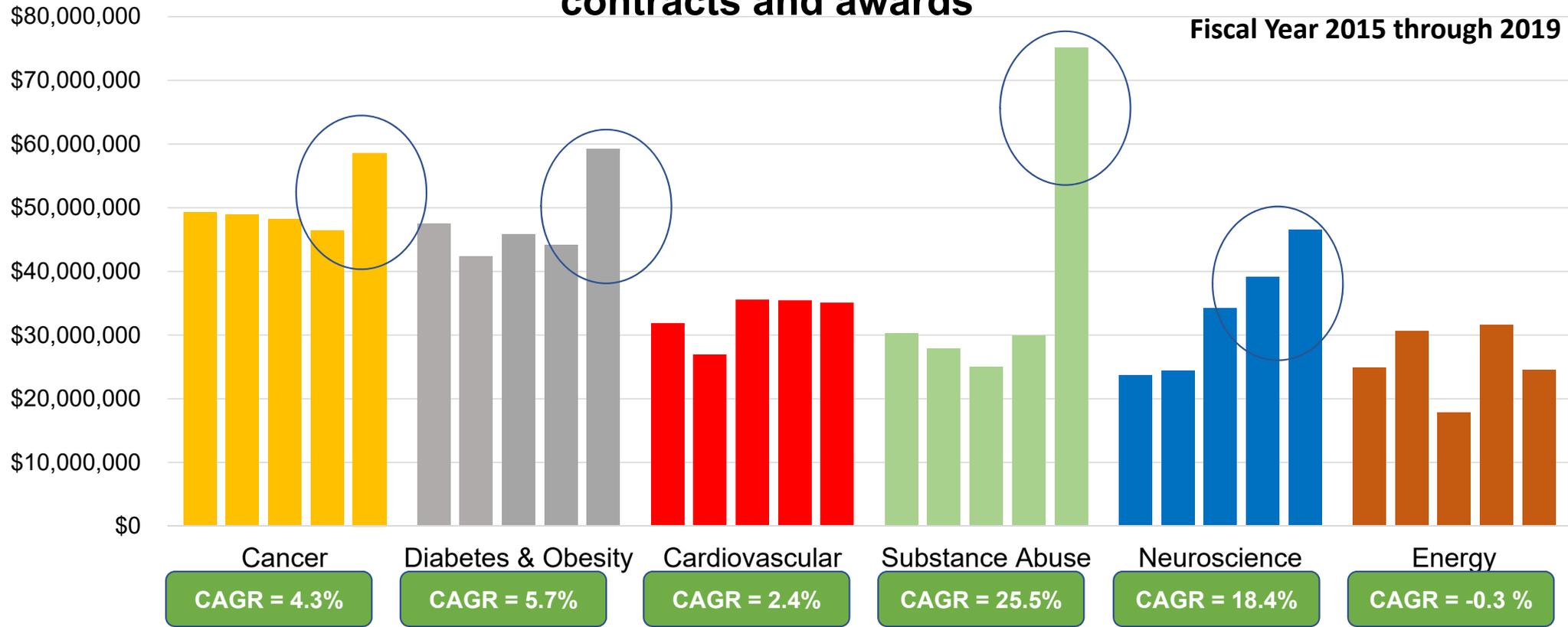
New developments through this program:

- 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



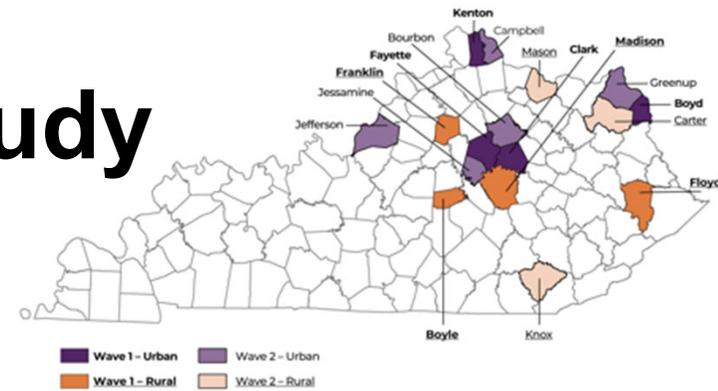
University of Kentucky

Designation of these research priorities is positively impacting grant contracts and awards



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:

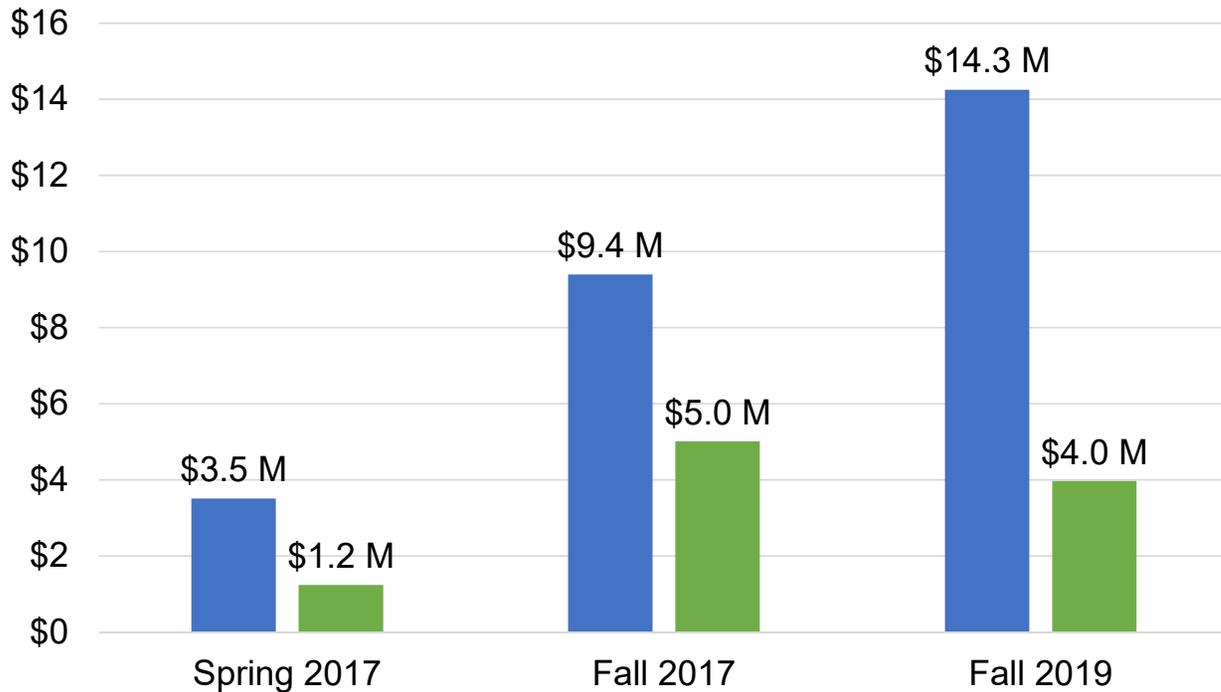
- First Floor Fit-out:
 - Wet-Labs with 12 lab benches
 - Construction and architecture teams working with the NIH on design and plans for construction

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

Submitted Proposals Funded



Equipment Competition:

Investment Since 2017

**\$10.2 M Total Equipment
across campus**

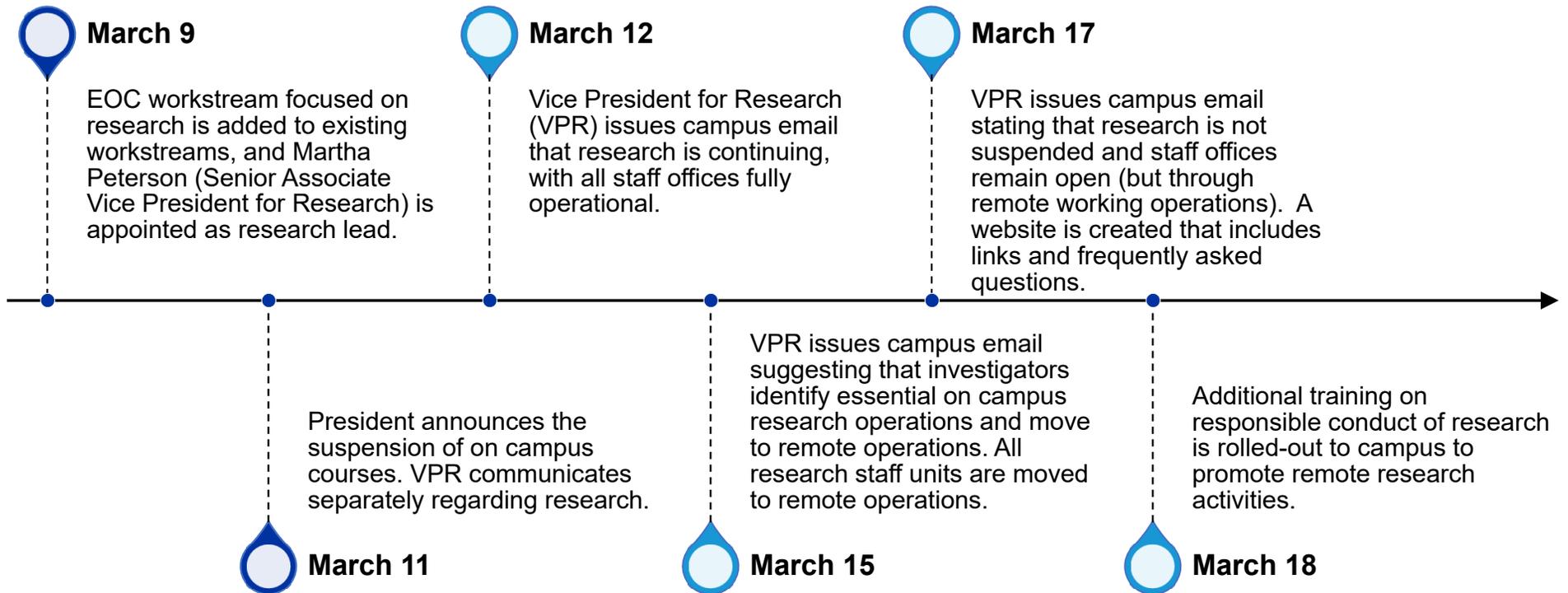
COVID-19 and Research

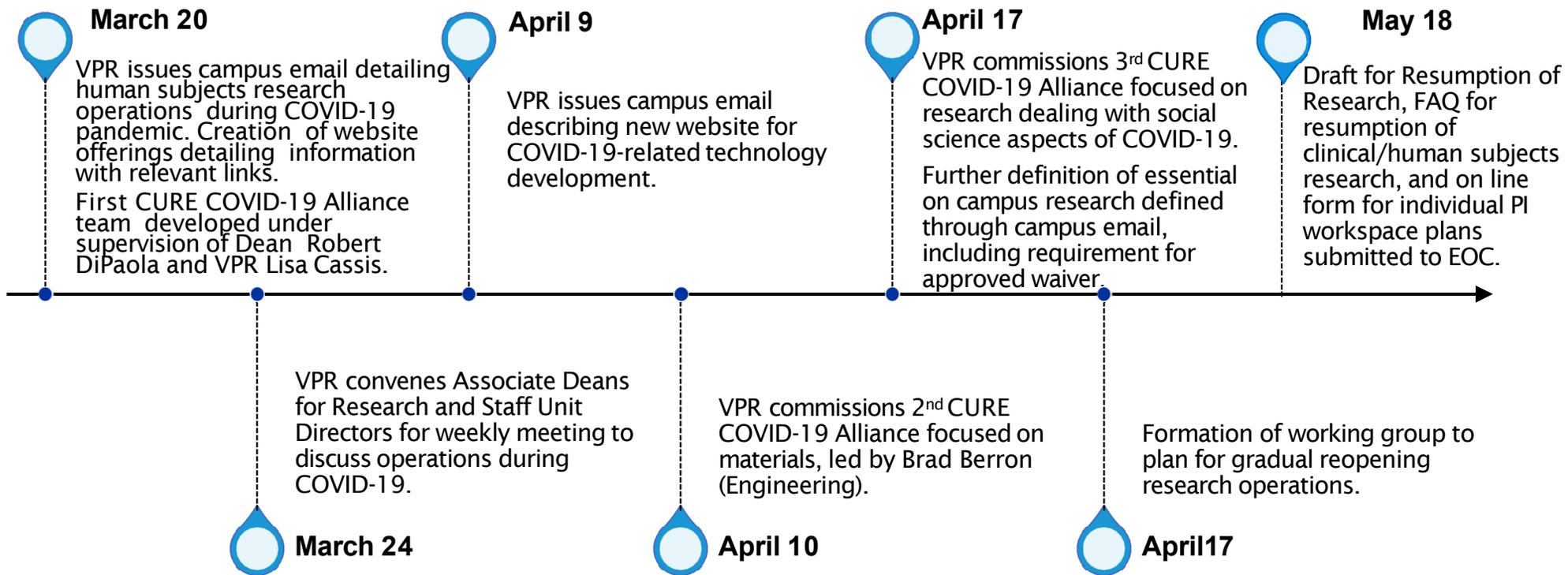
We are not immune to this terrible pandemic, but research is, and will be a powerful vehicle to develop solutions

RESEARCH AMID COVID-19

May 2020

Timeline of events





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>)
 - Innovation and discovery related to COVID-19 (<https://www.research.uky.edu/otc/covid19>)
 - Information for operations on grants and contracts (<https://www.research.uky.edu/office-sponsored-projects-administration/covid-19-updates>)
 - Funding opportunities for COVID-19 related research (<https://www.research.uky.edu/proposal-development-office/covid-19-resources-researchers>)

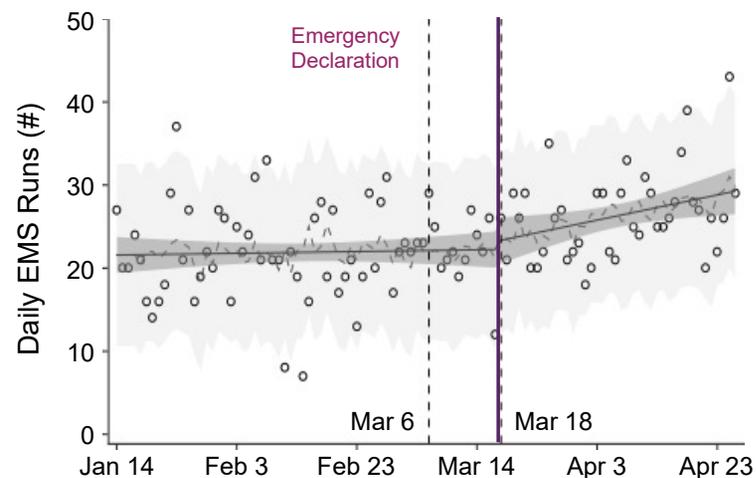
COVID-19 and Research: Our response, giving our PPE to UKHC

- 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



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

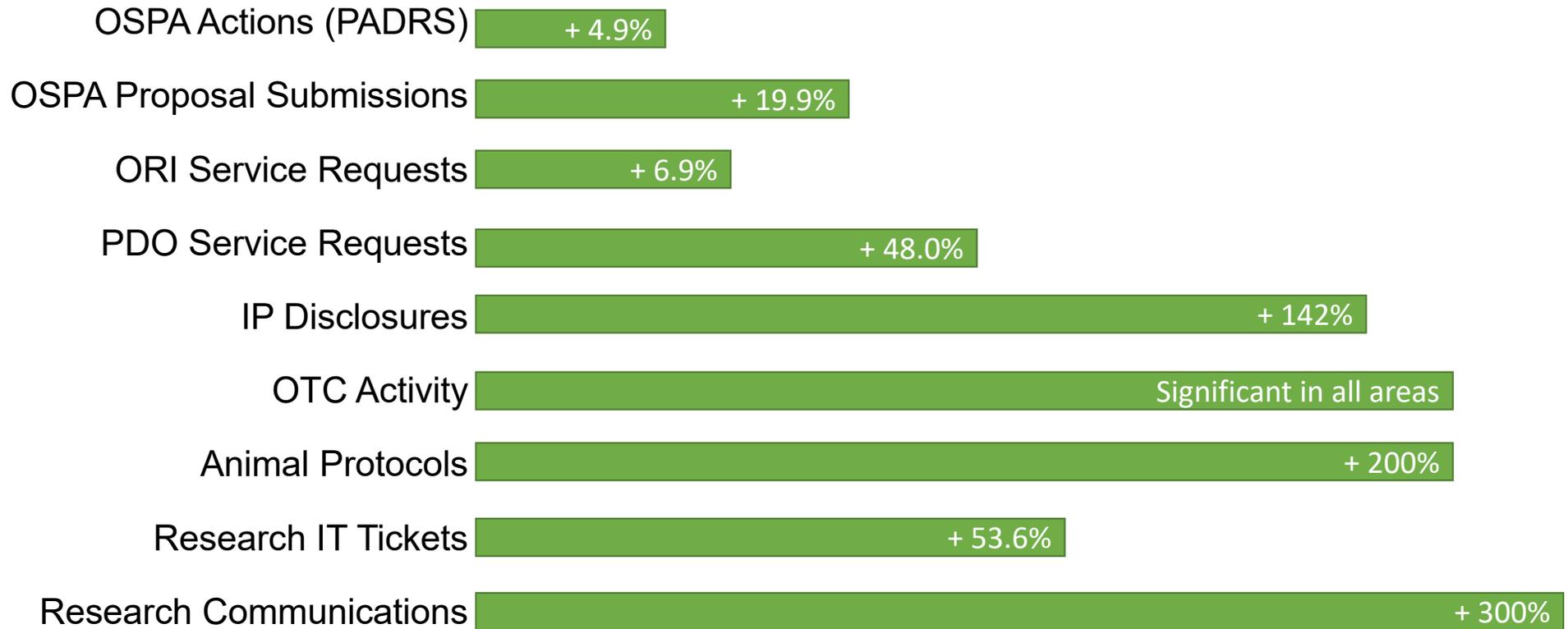
Increased urgency to scale up
interventions due to greater risk
for overdose and stretched
resources in public health depts.

- 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

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.



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)