University of Kentucky Research Enterprise

Status
Priorities
Investments
It’s still not recovering

FEDERAL RESEARCH ENVIRONMENT
Total higher education research expenditures were $65.8 billion in FY12*; more than 60% was funded by the federal government.

### Higher Education Total Research & Development Expenditures, FY12*

**By Source of Funds**

100% = $65.8 billion

- **Federal government**: $40,130 million (61%)
- **State and local government**: $3,704 million (6%)
- **Institution funds**: $13,674 million (21%)
- **Business**: $3,282 million (5%)
- **All other sources**: $4,984 million (7%)

*Latest year available

Source:
2012 – NSF, National Center for Science & Engineering Statistics, Higher Education Research and Development Survey 2012, Table 1
Just over half of the federal component is funded by Health and Human Services, of which NIH is the biggest contributor.
And the prospect is that funding will not exceed a flat line in even the best-case scenario.
How we are positioned nationally

UK’S CURRENT RESEARCH PORTFOLIO
At UK, of the total FY14 Sponsored Program expenditures of $255 million, 70% ($177 million) was classified as research.

Total Sponsored Program Expenditures, FY14

100% = $255 million

$ in millions

- Research: $177 (70%)
- Public Service: $63 (25%)
- Instruction: $11 (4%)
- Other: $3 (1%)
UK’s research is sponsored predominantly by federal agencies

Total Sponsored Research Expenditures, FY14
By Sponsor Type
100% = $177 million

- Federal: $142 million (80%)
- Industry: $11 million (6%)
- State of Kentucky: $10 million (6%)
- Foundation/NPO: $13 million (7%)
- College/University/Affiliates: $0.9 million (1%)
- Other Government: $0.1 million (0%)
The College of Medicine is the largest college in research followed by Engineering and large research centers.

Total Sponsored Research Expenditures, FY14

By College

100% = $177 million

$ in millions

- Medicine: $84 million (47%)
- Engineering: $16 million (9%)
- Large Research Centers: $15 million (9%)
- Arts & Sciences: $10 million (5%)
- Ag, Food, Environ: $5 million (3%)
- Pharmacy: $5 million (3%)
- Public Health: $3 million (2%)
- Nursing: $2 million (1%)
- Dentistry: $2 million (1%)
- All Other: $1 million (0.5%)

$10 million is 5% of the total, $16 million is 9% of the total, and $84 million is 47% of the total.
The biggest of the top 15 departments/centers, by FY14 research expenditures, are multidisciplinary research centers.
HOW DO WE COMPARE WITH PEERS
While UK’s research volume has grown since 2004, its national ranking has declined.

UK Research & Development Expenditures and Rank
2004-2012*

Sources:
At the same time, the R&D spend of many aspirational research university peers has increased substantially.
In this competitive environment, UK’s national rankings show it situated toward the bottom of a set of benchmark institutions.

### Higher Education R&D Rankings – UK vs Benchmarks

<table>
<thead>
<tr>
<th>Institution</th>
<th>FY04 Research $ (millions)</th>
<th>FY04 Higher Ed R&amp;D Rank</th>
<th>FY12 Research $ (millions)</th>
<th>FY12 Higher Ed R&amp;D Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of North Carolina</td>
<td>$417</td>
<td>30</td>
<td>$885</td>
<td>11</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>$325</td>
<td>39</td>
<td>$507</td>
<td>36</td>
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<tr>
<td>University of Utah</td>
<td>$232</td>
<td>63</td>
<td>$430</td>
<td>50</td>
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<tr>
<td>University of Virginia</td>
<td>$229</td>
<td>67</td>
<td>$383</td>
<td>59</td>
</tr>
<tr>
<td>University of Kentucky</td>
<td>$298</td>
<td>50</td>
<td>$361</td>
<td>64</td>
</tr>
<tr>
<td>University of Kansas</td>
<td>$181</td>
<td>83</td>
<td>$286</td>
<td>75</td>
</tr>
<tr>
<td>University of Missouri</td>
<td>$218</td>
<td>69</td>
<td>$240</td>
<td>88</td>
</tr>
</tbody>
</table>

Source: National Science Foundation, National Center for Science & Engineering Statistics, Higher Education Research & Development Survey, FY12, Table 4-Ranked by All R&D expenditures; NSF HERD ranks 2004 tab 27
UK RESEARCH IMPERATIVE
UK must be the research university for Kentucky…

• Make thoughtful strategic decisions on our research investments

• Focus on solving Kentucky’s biggest and most complex problems

• Invest in areas of strength that support this mission

• Continue to develop and enable the multidisciplinary teams it takes to tackle these problems

…Only UK has the strength and the breadth of programs to do this for our state
### NIH FUNDING

$76.4M Current amount

+ $9.6M Recent grant awards

~ $86.0M Total

Possible new rank = 49
Positive Indicators

- National Science Foundation EPSCoR Award: $24M
  - Investing $15.5M in UK’s research infrastructure

- Mark Williams – PCORI grant Effectiveness in Transitional Care
  - A $15M contract over three years with $6M coming to UK

- Wayne Sanderson – NIOSH grant Central Appalachian Region Educational Research Center
  - $990K awarded
WE NEED TO FOCUS INVESTMENTS-
PEOPLE, FACILITIES AND INFRASTRUCTURE

How do we do this?
Other institutions are making sharp, competitive moves. Some examples:

The University of Southern California recruited Drs. Arthur Toga and Paul Thompson plus their 100+ person scientific team running the Lab of Neuro Imaging at UCLA ($12M annual budget). U/Penn was rumored to be courting them as well.

For its Knight Cancer Institute, Oregon Health & Science University recruited Dr. Charles Blanke from The University of British Columbia ($40M in funding). OHSU is in securing $500M in donations to match $500M put up by Phil Knight of Nike.

MD Anderson recruited Dr. Ronald DePinho from Dana Farber Cancer Institute as President of MD Anderson’s Cancer Center. A 55-person team, and their funding, followed him to Houston.

CHLA recruited Dr. Bradley Peterson from Columbia University Dana Farber Cancer Institute as inaugural director of the Institute for the Developing Mind. He brought 18-20 researchers and their funding.
Additional examples include:

The University of Florida has created a plan to rise to national “preeminence” by recruiting top talent for its research strategy. It is backed by state funding and almost $1B in private fundraising.

Since its inception, the University of Utah’s USTAR has attracted 50 leading researchers from MIT, Harvard University, UCLA, Case Western, University of Arizona, Oak Ridge National Laboratory, and other top research institutions.

Northeastern University is planning to build a state-of-the-art, 220,000 square foot, Science and Engineering research building scheduled to open in 2016. This facility will provide space for Northeastern’s ongoing faculty hiring initiative.
And UK itself has engaged in such competitive moves

- Recruited Dr. Mark Evers from the University of Texas Medical Branch along with many colleagues from his laboratory
- Dr. Evers leads the Markey Cancer Center, which under his leadership has become the only NCI-designated Cancer Center in Kentucky

Fulfilling our land grant mission by solving Kentucky’s most complex and intractable problems is what excites and motivates our best researchers
These investments pay across campus…

• Recruited Dr. Kunlei Liu from the Babcock & Wilcox Company along with a $1.5 million investment from EON-US (now LGE/KU) to start carbon capture program for coal fired power plants.

• Dr. Liu founded industrial consortium (CMRG) in 2008, receiving $1.8 million annually in support.

• Dr. Liu has built a group of 39 researchers, including 6 coop students, and $28 million in active grants.
Centers, organized around multidisciplinary teams, are large and growing

Our smaller, growing units could be future stars

Many of our large & growing units are multidisciplinary

Some declining units may need to seek avenues of growth

Some large units are now challenged to reverse declines

GROWTH RATE

RESEARCH EXPENDITURES
College of Medicine data reveal the power of multidisciplinary teams in generating high levels of research funding per square foot.

<table>
<thead>
<tr>
<th>COM Department/Center/Team</th>
<th>Res $/Ft²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center on Aging</td>
<td>363</td>
</tr>
<tr>
<td>Toxicology</td>
<td>318</td>
</tr>
<tr>
<td>Nutritional Sciences</td>
<td>241</td>
</tr>
<tr>
<td>Anatomy &amp; Neurobiology</td>
<td>227</td>
</tr>
<tr>
<td>Physiology</td>
<td>211</td>
</tr>
<tr>
<td>Markey Cancer Center</td>
<td>166</td>
</tr>
<tr>
<td>Microbiology &amp; Immunology</td>
<td>138</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>102</td>
</tr>
</tbody>
</table>

The Markey Cancer Center underscores the strategic point. This rapidly growing center holds some space in reserve to accommodate expected increases in research activity.
The CAER, which is on a steep growth curve, also demonstrates the strong correlation between space and research volume.
Quality of Space Matters

Current College of Medicine space = 253,654 sq. ft.

- 41% of space was built between 1931 and 1979
- 26% was built between 1980 and 2002
- 33% was built between 2003 and 2009
Research Space, Net Square Feet
Lexington: 1.26 M, avg. age = 39 yr
Spindletop: 60 K, avg. age = 17 yr
• What clearly-defined focus areas for UK research will enable us to address the needs of the Commonwealth, build on our strengths, and achieve distinctiveness relative to our peers?

• What resource commitments will be needed to grow our capabilities and relative position in our designated focus areas?

• What implementation approaches are necessary to ensure the enduring progress of our research enterprise?

Successfully bring all of these components together

CENTER OF BIOMEDICAL RESEARCH EXCELLENCE ON OBESITY AND CARDIOVASCULAR DISEASES