STATE OF OUR STATE

2015 OPEN FORUM TOWN HALL

OFFICE OF THE VICE PRESIDENT FOR RESEARCH
FY15 Research & Development Highlights

• Research Expenditure = $317.2 million
• Foundation-related spending increased 41% - $5.6M to $7.9M
• Federal funding expenditure increased by 3% to $219.3M

Tech Transfer
• 92 invention disclosures filed and 49 patents filed
• 43 agreements with companies to license CSU technologies
• Industry-related revenue increased by 276%, to $4.78M
Agenda:

- The National S&T Framework
- CSU Research Analytics
- Research Success Initiatives
- University Research Budget & Operations
- Discussion and Q&A
CSU Federal Award Dollars and Federal Budget Authority for Research & Development

CSU Federal Awards Compared to Federal Budget Authority for R&D (Constant FY 2015 $)

US Total R&D Budget (Billions) vs. CSU Federal R&D Awards (Millions)
Awards By College

Award Amounts Received by College

- Agricultural Sciences
- Health & Human Sciences
- Business
- Engineering
- Liberal Arts
- Natural Sciences
- Non-College
- Veterinary Medicine and Biomedical Sciences
- Warner College of Natural Resources
## Research Expenditures in 53 Accounts for Academic Colleges

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<tr>
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</thead>
<tbody>
<tr>
<td><strong>Agricultural Sciences</strong></td>
<td>13,282,762</td>
<td>13,754,050</td>
<td>13,095,281</td>
<td>13,831,079</td>
<td>11,775,614</td>
<td>15,854,761</td>
<td>-14.4%</td>
</tr>
<tr>
<td><strong>Business</strong></td>
<td>4,214,609</td>
<td>1,321,033</td>
<td>1,600,542</td>
<td>1,480,805</td>
<td>1,310,321</td>
<td>931,811</td>
<td>-0.8%</td>
</tr>
<tr>
<td><strong>Engineering</strong></td>
<td>57,640,408</td>
<td>62,160,762</td>
<td>63,915,079</td>
<td>63,491,306</td>
<td>60,500,167</td>
<td>59,115,887</td>
<td>-2.7%</td>
</tr>
<tr>
<td><strong>Health &amp; Human Sciences</strong></td>
<td>9,796,763</td>
<td>9,566,357</td>
<td>9,700,817</td>
<td>7,141,502</td>
<td>7,060,139</td>
<td>6,554,173</td>
<td>-26.2%</td>
</tr>
<tr>
<td><strong>Liberal Arts</strong></td>
<td>1,687,976</td>
<td>1,898,468</td>
<td>1,927,546</td>
<td>2,081,446</td>
<td>1,626,014</td>
<td>1,908,570</td>
<td>-14.4%</td>
</tr>
<tr>
<td><strong>Natural Sciences</strong></td>
<td>28,167,309</td>
<td>31,131,052</td>
<td>32,773,041</td>
<td>36,295,681</td>
<td>34,639,658</td>
<td>32,533,500</td>
<td>11.3%</td>
</tr>
<tr>
<td><strong>Veterinary Medicine</strong></td>
<td>57,132,847</td>
<td>54,156,980</td>
<td>54,786,886</td>
<td>51,144,349</td>
<td>49,848,922</td>
<td>44,997,445</td>
<td>-8.0%</td>
</tr>
<tr>
<td><strong>Warner College of Natural Resources</strong></td>
<td>48,516,544</td>
<td>49,358,971</td>
<td>50,321,679</td>
<td>53,202,947</td>
<td>59,685,413</td>
<td>64,916,302</td>
<td>20.9%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>220,439,218</td>
<td>223,347,673</td>
<td>228,120,871</td>
<td>228,669,115</td>
<td>226,446,248</td>
<td>226,812,450</td>
<td>1.4%</td>
</tr>
</tbody>
</table>
Number of Proposals Submitted

No. of Proposals Submitted by College

- Agricultural Sciences
- Applied Human Sciences
- Business
- Engineering
- Liberal Arts
- Natural Sciences
- Non-College
- Veterinary Medicine and Biomedical Sciences
- Warner College of Natural Resources
Research Analytics: New Efforts

From Reactive to Strategic Decision Making
  • Improve data collection
  • Evaluate and implement reporting tools
  • Develop and implement data quality assurance program
  • Develop predictive reporting models
  • Develop meaningful metrics in collaboration with campus stakeholders

Questions
  • What are the right metrics to assess our strategic strengths?
  • How collaborative and interdisciplinary are we?
  • How do we compare to our peers and national trends?
  • Where are the current opportunities and are we positioned to respond?
  • How international is our research portfolio and where do growth opportunities exist?
  • What is our research capacity (potential for growth)?
Research, Discovery, Artistry and Translational Goals from the Current CSU Strategic Plan #1-6

1. Grow interdisciplinary and international teaming programs and support function to foster collaborative consortia driven funding opportunities (e.g. CIP, PRSE).
2. Focus on one or more potential strategic research areas such as: Advanced Materials, Energy, One Health, Neuroscience, Water, Energy and Sustainability.
3. Increased organized and proactive communications that herald research and creative artistry.
4. Increased student learning programs and post graduate degrees awarded.
5. Diversify funding base through cross college Innovation and translational research programs to accelerate the production of intellectual property.
6. Implement digital measures and additional electronic tools for reporting, collaborating and communicating productivity and excellence in research and creative artistry.
Research, Discovery, Artistry and Translational Goals from the Current CSU Strategic Plan #7-12

7. Renovate priority facilities to sustain research, creative artistry and scholarly excellence.
8. Increased number of new facilities to support strategic investments in research and creative artistry excellence.
9. Establish and implement data and predictive analytical tools needed to support research enterprise.
10. Increase faculty satisfaction with services, core facilities and instrumentation, faculty research and creative artistry space, and sponsored activity.
11. Organize and staff sponsored activities to support future growth of research and creativity enterprise including an office for enhanced proposal development for complex large proposal development.
12. Develop and execute plan to sustain foundational and emerging research and instrumentation, research and creative artistry facilities.
CSU Strategic Plan

- Grow trans-disciplinary translational research teams with programs such as Catalyst for Innovative Partnerships and through cluster hires

- Complete implementation of Research Administration programs Kuali Coeus and Digital Measures

- Develop master plan for research facilities at foothills and central campus

- Enhance research internationalization including Todos Santos and programs in Asia, Africa, India and South America
HARP
Horizontally Accelerated Research Programs (HARP)

Stimulate new diverse funding opportunities based on multidisciplinary high impact ideas

• Catalyst program
• Program for Research and Scholarly Excellence
• New Initiatives
  • One Health
  • Virtual Reality

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Catalyst for Innovative Partnerships

CIP supports 7 interdisciplinary research teams tackling grand societal & scientific challenges:
- Coalition for Development and Implementation of Sensor Systems (CDISS)
- Compatible Polymers Network (CPN)
- Fort Collins EcoDistricts
- Innovation Center for Sustainable Agriculture (ICSA)
- Institute for Genomic Architecture and Function (IGAF)
- Partnership for Air Quality, Climate, and Health (PACH)
- Smart Village Microgrids (SVM)

- 146+ Faculty & Researchers
- 9 Grad Students
- 8 Colleges
- 57 Depts. & Centers
- 45 External Partners
- $64.4M+ in proposals already submitted
- $3.3M+ in awards already received
- $87.5M+ in proposals planned for 2016/2017

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Catalyst for Innovative Partnerships

“Big Bet” Funding
- Driving towards multidisciplinary, multi-partner proposals in excess of $10M
- Diverse funding base: Federal, Industry, Foundation, Private Donor

Cluster Hires
- Synchronized with PACH
- 5 new positions, linking social and physical sciences

Science Of Teams
- Research network formation, organization, impact on interdisciplinary research
- CPN case study, expanding to all of CIP

Leveraging Relationships
- Engagement with Advancement/Corporate Relations, Foundation Relations, International Programs, etc.
- Cathay Biotech, Coke, Leprino, Mars, National Western Center, Starbucks, etc.

For the Future
- Research Development Office
- Assistant Director of Development

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Programs of Research & Scholarly Excellence (PRSE) Update

• 2-4 year cycle, starting with nominations, leading to 3 benefits:
  • PRSE designation
  • Annual VPR resource allocation (approx. $25k/yr)
  • Annual grad recruitment allocation ($10k/yr)

• PRSE designation information gathering across campus

• Working with CRAD to design a revised RFP
  • Potential considerations: decouple the competitive designation process from a separate, competitive strategic funding opportunities for designees

• Feedback is welcomed

• New RFP to be launched in early 2016
One Health
Creating sustainable futures for people, animals, and the environment: An interdisciplinary approach to bison reintroduction in Northern Colorado

- Prepared and piloted test visitor surveys
- Hired research assistants
- Purchased project supplies
- Calibrated field instruments
- Finalized visitor survey
- Pre-bison visitor surveys and visitor use data collection
- Pre-bison ecological data collection
- Collected semen and embryos from Yellowstone bison with Brucellosis
- Finalized corral and fence design
- Final pregnancy checks and disease testing for bison
- Crowd sourcing campaign launched
- Bison reintroduced to Soapstone Prairie and Red Mountain Open Space
- Reintroduction ceremony and public engagement on November 1st, 2015
**Role of common free-living amoebae in environmental persistence and facilitation of pathogenic organisms**

**Proposed work**

- Infection of 7 amoeba spp. with FT, MB and YP Assess uptake, replication & persistence

**Laboratory**

- **Achieved:** Infections of 4 FLA spp. with FT
- Optimization of methodologies to rapidly monitor bacterial uptake, intracellular survival, and FLA encystment

- **In progress:** FLA infections with MB and YP
- Confocal microscopy

**Field**

- **Achieved:** Samples from FT and YP endemic areas in CO collected Conditions for culturing FLA and bacteria from samples defined

- **In progress:** Additional culturing of FLA from CO soil
  PCR & genotyping (FLA, pathogens)

**in silico**

- **Achieved:** GIS base map created
  Initial field data added

- **In progress:** Metadata standard development

**New Funding**

DARPA
Contract #: W911NF-15-2-0124
Co-PIs: Mary C. Jackson; Richard A. Bowen; Jan E. Leach; William H. Wheat; Mercedes Gonzalez-Juarrero & Bradley R. Borlee
“Feral Macrophages: Dynamics of Free-Living-Amoeba interactions with Pathogens”
The goal of this project is to study the interactions of amoebae with various bacterial and fungal pathogens.

**Progress Report**
(May-Oct. 2015)

**Analysis of environmental samples for the co-occurrence of FLA and FT, MB or YP**

**Combination of FLA/pathogen/disease/geospatial database with environmentally-based databases Risk assessment modeling**
Ethos, agility and innovative infrastructural support of sponsored activity, support of large complex proposals, animal use, and core facilities. Creation of VPAC.
CORE Research Facilities

Foundational and Emerging Cores

• RFP Process resulted in OVPR funding for 7 Research Core Facilities

The Year Ahead

• Harmonize business operations, reporting metrics and user access interfaces → Enterprise level Core Management Software

• Establish infrastructure for OVPR CORES Service

Long Term Challenge

• Identifying needed resources to upgrade foundational core facilities and sustain emerging core programs
Infrastructure: Sponsored Programs

- Huron Study
- Office of Sponsored Programs Pilots
- Office of Sponsored Programs Post-Award
- Research Administration Forum
- Complex Proposal Support (Research Development)
Kuali Implementation

- KC Analysis of Software as a Service vs. On Premises Implementation Underway
- KC Enhanced Negotiation Module Implementation (Winter/Spring 2016)
  - Configured Software
  - Completed SOP
  - Developing Training Materials
- Labor Distribution and Effort Certification
  - 2015 - INSTAR Recommended that the Kuali Team Address this Process
  - Three Phases Identified; Reduce population; Move Effort Distribution to Kuali; Electronically Certify Distribution through Kuali Workflow
- Integration of Contracts and Grants Billing with KFS
Kuali Implementation

- Annual Conflict of Interest Disclosures
  - In Collaboration with Provost Office
  - Faculty & Professional Staff Participation
- KC Proposal Development Launch (Spring/Summer 2016)
  - Issued RFP for Training Services
  - Set Up Test Environment
- Export Control Module
  - Now in production to meet Federal Requirements
  - Collaborating with other Kuali Partners to Enhance Links to both Proposals and Awards
- IRB and IACUC Compliance Modules
  - Working with other Kuali Partners to Include Protocols in Workflow
  - New User Interface Enables Infrequent Users to Navigate Process
  - Evaluating a Questionnaire to Pre-determine Exempt and Expedited Protocols
Infrastructure: Other Projects

• Digital Measures Implementation

• Research Facilities Initiatives

• Sponsored Projects Procurement process analysis

• Software assessments: limited submissions management, lab management
PROPEL

People Reaching Optimal Performance and Excellence in University Life (PROPEL)

Optimizing performance and excellence in personnel, acknowledging achievements, recruitment/retention of faculty alignment with HARP research initiatives, grad/undergrad research, and increased inclusion of multicultural elements including diverse workforce and ideas.

- VPR Graduate Fellowships
- VPR Research Excellence Awards
- Interdisciplinary Awards
VPR Fellows Program

• Created to support excellence in graduate research and to promote interdisciplinarity

• Fellows will
  • Receive up to $4000 in Scholarship and Travel support
  • Participate in Professional development opportunities
    • Workshops, Mentorships, Leadership engagement
    • Experience the triple helix – government, foundations, community

• Top performing students from the Graduate Student Showcase will be invited to attend a 3 minute competition on Feb. 15th
  • 12-15 students will be chosen for the 1st VPR Fellows Cohort
VPR Research Excellence Award

“The VPR Research Excellence Award is recognition to members of the campus community for transformative discovery in high impact areas at the sole selection and discretion of the Vice President for Research.”

Fall 2015 Winners:

Cameron Ghalambor, Professor of Biology

Kim Hoke, Associate Professor of Biology

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Interdisciplinary Scholarship Award (ISA)

Announced Oct. 28, 2015
Applications due Jan. 19, 2016

Four 2015 Awards:
2 team ISA - $10,000/award
2 Individual ISA - $ 5,000/award

Recipients awarded plaque at Celebrate! in April and featured on the LSC Research Wall.

Established Team ISA
- Sue VandeWoude
- Kevin Crooks

Established Individual ISA
- James Bamburg

Emerging Team ISA
- Katharine Leigh
- Laura Malinin

Emerging Individual ISA
- Elizabeth Ryan
VPR Budget and Operations
### FY16 OVPR Budget Summary

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<tr>
<th><strong>Operations</strong></th>
<th><strong>Infrastructure</strong></th>
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<tbody>
<tr>
<td>Research Integrity &amp; Compliance Review Office</td>
<td>Laboratory Animal Resources (LAR)¹</td>
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<tr>
<td>Biosafety Office (transitional)</td>
<td>Core &amp; Specialized Facilities</td>
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<tr>
<td>Export Control</td>
<td>Kuali Coeus</td>
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<tr>
<td>Responsible Conduct of Research</td>
<td>Research Building Revolving Fund</td>
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<tr>
<td>Research Services</td>
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<tr>
<td>Sponsored Programs</td>
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<tr>
<td>Office of the VP for Research</td>
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<tr>
<td>Communications &amp; Events</td>
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<tr>
<td><strong>Centers &amp; Institutes</strong></td>
<td><strong>New Faculty Recruitment²</strong></td>
</tr>
<tr>
<td>Flint Animal Cancer Center Programs</td>
<td>2,982,437</td>
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<tr>
<td>Energy Institute</td>
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<tr>
<td>Infectious Disease Research Center</td>
<td></td>
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<tr>
<td>Regional Biocontainment Lab</td>
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<tr>
<td>Research Innovation Center (RIC)</td>
<td></td>
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<tr>
<td>BioMARC (other than external awards)</td>
<td></td>
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<tr>
<td>One Health</td>
<td></td>
</tr>
<tr>
<td><strong>Total Operations</strong></td>
<td><strong>Total Infrastructure</strong></td>
</tr>
<tr>
<td>5,636,584</td>
<td>10,618,258</td>
</tr>
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¹ LAR includes general ops - $787,256 and recharge - $2.7m
² This represents the initial allocation of funding to support new faculty recruitment. Additional Central support may be provided if/as needed to meet commitments.
<table>
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<tr>
<th>RA/RSP Investments</th>
<th>Seasonal Requests for OVPR Funding (Quarterly RFP, cost share, other)</th>
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<tr>
<td></td>
<td>1,363,592</td>
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<tr>
<th>Programmatic Initiatives</th>
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<tr>
<td>Catalyst Programs</td>
<td>671,194</td>
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<tr>
<td>Governmental Relations</td>
<td>86,000</td>
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<tr>
<td>Graduate/Undergraduate Research</td>
<td>80,000</td>
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<tr>
<td>International Programs</td>
<td>75,736</td>
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<tr>
<td>Invitational Travel</td>
<td>16,000</td>
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<tr>
<td>Water Initiative, Special Assessments</td>
<td>50,285</td>
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<tr>
<td>Programs of Research &amp; Scholarly Excellence</td>
<td>455,400</td>
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<tr>
<td>Recognition/Awards/Fellowships</td>
<td>100,000</td>
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<tr>
<td>Technology Transfer</td>
<td>348,847</td>
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<tr>
<td>Virtual Reality Initiative</td>
<td>100,000</td>
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</table>

**GRAND TOTAL** $27,240,929
FY16 Percent Budget Allocation By Category

- Operations: 21%
- Superclusters & Institutes: 17%
- Infrastructure: 39%
- New Faculty Recruitment: 11%
- RA/RSP Investments: 5%
- Programmatic Initiatives: 7%
VIRTUAL REALITY comes to campus

Interested in virtual reality for your research, program, department or college?

CSU is moving into the future with a Virtual Reality (VR) Initiative. With great promise for use on our campus, VR is the focus at an informational talk led by Alan Rudolph, Vice President for Research. Learn about VR’s future and try virtual reality for yourself.

Four opportunities to join in!

**DECEMBER 4, 2015**
10-11 am | LSC Rm 308-310
3-4 pm | LSC Rm 312

**JANUARY 28, 2016**
10-11 am | LSC Rm 304-306
4-5 pm | LSC Rm 304-306

Colorado State University
VICE PRESIDENT FOR RESEARCH
Q&A