Analyzing and Innovating Research at Rutgers

February 12, 2018 | 4:30 p.m. to 6:00 p.m.

Rutgers Academic Building, Lecture Hall 4225 | 15 Seminary Place, New Brunswick

What is the university’s research footprint? How does it compare to our Big Ten peers? What are our areas of research strength? Are there existing opportunities that we can leverage to enhance the research effort at Rutgers?

Campus Conversations is an interactive series where discussion and data come together to shed light on areas of strength, challenges, and opportunities for growth at Rutgers University–New Brunswick.
Agenda

• Introduction – The Mission and Growth of Rutgers as a Research University
• Key Metrics for Assessing Research Performance
• Research Focus and Productivity
• National Recognition and Capacity
• Research Support
• Some Ideas to Spur Growth
The American Research University

Wilhelm von Humboldt – architect of the Prussian education system
  – Unity of research and teaching (Theory of Human Education, c 1793)
American research universities founded on the Humboldt model
  - Land grant public research universities, 1862
  - Association of American Universities, 1900
Milestones in the Development of Rutgers as a Research University

1766 – Rutgers is founded as Queen’s College; the college is renamed Rutgers in 1825.

1864 – Per the federal Morrill Act, the state legislature chooses Rutgers (over Princeton) as New Jersey’s land-grant institution.

1880 – The New Jersey Agricultural Experiment Station, aligned with Rutgers, is founded.

1924 – Rutgers College officially becomes Rutgers University.

1956 – Rutgers and the State of New Jersey enter into a compact, still in effect today, that affirms Rutgers’ position as The State University and creates the Board of Governors.

1989 – Rutgers is invited to join the prestigious Association of American Universities, recognizing its status as one of the top research universities in North America.

2012 – The New Jersey Medical and Health Sciences Education Restructuring Act is signed into law, merging two medical schools and other entities of the former University of Medicine and Dentistry into Rutgers, effective summer of 2013.

2013 – Rutgers joins the Committee on Institutional Cooperation (CIC), a consortium of outstanding research universities. The CIC is renamed the Big Ten Academic Alliance in 2016.
A major focus of this presentation is on research spending, a measure of research activity in which comparative data is readily available through the National Science Foundation.

Emphasis is on spending in the science and engineering fields; significant investment by federal funding agencies.

Excellent work being done at Rutgers in non science and engineering; some of the most distinguished departments at Rutgers are in fields outside of science and engineering.

“It would be folly to set up a program under which research in the natural sciences and medicine was expanded at the cost of the social sciences, humanities, and other studies so essential to national well-being.”

Vannevar Bush
Science the Endless Frontier
1945
Non-S&E Graduate School Rankings

Source: All subject rankings reflect 2017-2018 U.S. News Best Grad Schools rankings, except for Philosophy which reflects 2010 NRC Rankings. Note: Averages based on schools and programs ranked; some schools and programs are not ranked.
Scholarship Activity of Rutgers–New Brunswick Faculty in Non-S&E Fields Over the Last Five Years

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reviews</td>
<td>240</td>
</tr>
<tr>
<td>Articles in Refereed Journals</td>
<td>1,968</td>
</tr>
<tr>
<td>Books</td>
<td>207</td>
</tr>
<tr>
<td>Other Publications</td>
<td>623</td>
</tr>
<tr>
<td>Works in Progress</td>
<td>486</td>
</tr>
<tr>
<td>Articles in Non-refereed or General Journals</td>
<td>359</td>
</tr>
<tr>
<td>Other Scholarship</td>
<td>185</td>
</tr>
<tr>
<td>Electronic Publications, Refereed</td>
<td>168</td>
</tr>
<tr>
<td>Published Conference Proceedings</td>
<td>52</td>
</tr>
<tr>
<td>Edited Books, Anthologies Collections, Bibliographies</td>
<td>194</td>
</tr>
<tr>
<td>Electronic Publications, Not Refereed</td>
<td>126</td>
</tr>
<tr>
<td>Textbooks</td>
<td>166</td>
</tr>
<tr>
<td>Professional Awards and Honors</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Rutgers University Faculty Survey
# An Example of Faculty Excellence in a Non-S&E Discipline:
## Mason Gross School of the Arts Faculty

<table>
<thead>
<tr>
<th>Major Academic and Achievement Awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ACLS Fellowships – 2</td>
</tr>
<tr>
<td>• American Academy of Arts and Letters – 3</td>
</tr>
<tr>
<td>• Apexart Franchise Program Award -1</td>
</tr>
<tr>
<td>• Avery Fisher Career Grants – 2</td>
</tr>
<tr>
<td>• Bambi Award – 1</td>
</tr>
<tr>
<td>• Baryshnikov Fellowship – 1</td>
</tr>
<tr>
<td>• Bessie Awards - 3</td>
</tr>
<tr>
<td>• Bogliasco Fellowship – 1</td>
</tr>
<tr>
<td>• Doris Duke Award – 1</td>
</tr>
<tr>
<td>• Foundation for Contemporary Art Award – 1</td>
</tr>
<tr>
<td>• Fulbright Fellowships – 10</td>
</tr>
<tr>
<td>• Grammy Awards – 10</td>
</tr>
<tr>
<td>• Grammy Nominations – 22</td>
</tr>
<tr>
<td>• Guggenheim Fellowships – 13</td>
</tr>
<tr>
<td>• IREX Fellowship – 1</td>
</tr>
<tr>
<td>• Jerome Robbins Award – 1</td>
</tr>
<tr>
<td>• MacArthur Fellowships – 2</td>
</tr>
<tr>
<td>• Naumburg First Prize – 2</td>
</tr>
<tr>
<td>• NEA Fellowships – 2</td>
</tr>
<tr>
<td>• NEH Fellowships – 3</td>
</tr>
<tr>
<td>• OBIE Award -1</td>
</tr>
<tr>
<td>• Rockefeller Fellowships – 2</td>
</tr>
<tr>
<td>• Rome Prizes – 2</td>
</tr>
<tr>
<td>• Tony Awards – 2</td>
</tr>
<tr>
<td>• Tony Nominations - 12</td>
</tr>
</tbody>
</table>

Note: Awards curated by the Mason Gross School of the Arts Administration
Key Metrics for Assessing Research Performance
S&E Research Expenditures Over Time
Rutgers–New Brunswick
($=Thousands)

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Figures before 2010 reflect university wide reporting.
S&E Research Expenditures Over Time – By Source
Rutgers–New Brunswick
($=Thousands)

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Figures before 2010 reflect university wide reporting.
Share of S&E Research Expenditures Over Time – By Source
Rutgers–New Brunswick

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Figures before 2010 reflect university wide reporting.
All Research Expenditures – By Source
Big Ten Publics – FY2016
($=Thousands)

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Reflects all reported expenditures, not just S&E. Indiana includes Bloomington & IUPUI. "Other" includes non-profit sources.
## Share of All S&E Research Expenditures for Rutgers and Big Ten
### FY1980, FY2000, and FY2016 (% Share)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Federal</th>
<th>State/Local</th>
<th>Institutional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rutgers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>0.6%</td>
<td>0.4%</td>
<td>0.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Big Ten</td>
<td>1.5%</td>
<td>1.3%</td>
<td>1.1%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Publics</td>
<td>1.6%</td>
<td>1.7%</td>
<td>1.9%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Top 3</td>
<td>2.0%</td>
<td>1.9%</td>
<td>2.5%</td>
<td>2.7%</td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rutgers</td>
<td>0.7%</td>
<td>0.5%</td>
<td>0.0%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Big Ten</td>
<td>1.2%</td>
<td>1.5%</td>
<td>1.0%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Publics</td>
<td>1.1%</td>
<td>1.4%</td>
<td>1.0%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Top 3</td>
<td>1.5%</td>
<td>1.5%</td>
<td>1.7%</td>
<td>2.1%</td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rutgers</td>
<td>0.9%</td>
<td>0.8%</td>
<td>0.0%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Big Ten</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Publics</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.2%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Top 3</td>
<td>1.6%</td>
<td>1.6%</td>
<td>1.1%</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

**Source:** NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey

Note: Rutgers figures before 2010 reflect university wide reporting. Indiana includes Bloomington & IUPUI for 2016 and is university wide before 2010.
Compounded Annual Growth Rate of Total Research Expenditures
Big Ten Publics, FY2010, and FY2016

($=Thousands)

<table>
<thead>
<tr>
<th>State</th>
<th>FY2010</th>
<th>FY2016</th>
<th>FY2010-FY2016 CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>$1,184,445</td>
<td>$1,436,448</td>
<td>2.8%</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>$1,029,295</td>
<td>$1,157,680</td>
<td>1.7%</td>
</tr>
<tr>
<td>Minnesota</td>
<td>$786,074</td>
<td>$910,181</td>
<td>2.1%</td>
</tr>
<tr>
<td>Penn State</td>
<td>$770,449</td>
<td>$825,561</td>
<td>1.0%</td>
</tr>
<tr>
<td>Ohio State</td>
<td>$755,194</td>
<td>$818,464</td>
<td>1.2%</td>
</tr>
<tr>
<td><strong>Rutgers</strong></td>
<td><strong>$428,432</strong></td>
<td><strong>$630,212</strong></td>
<td><strong>5.7%</strong></td>
</tr>
<tr>
<td>Illinois</td>
<td>$515,133</td>
<td>$625,180</td>
<td>2.8%</td>
</tr>
<tr>
<td>Michigan State</td>
<td>$431,373</td>
<td>$613,369</td>
<td>5.2%</td>
</tr>
<tr>
<td>Purdue</td>
<td>$548,980</td>
<td>$606,302</td>
<td>1.4%</td>
</tr>
<tr>
<td>Indiana</td>
<td>$473,714</td>
<td>$566,619</td>
<td>2.6%</td>
</tr>
<tr>
<td>Maryland</td>
<td>$451,415</td>
<td>$539,388</td>
<td>2.9%</td>
</tr>
<tr>
<td>Iowa</td>
<td>$444,034</td>
<td>$473,362</td>
<td>0.9%</td>
</tr>
<tr>
<td>Nebraska</td>
<td>$224,135</td>
<td>$294,856</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

A compound annual growth rate (CAGR) is the mean annual growth rate over a specified period of time.

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Reflects all reported expenditures, not just S&E. Indiana includes Bloomington & IUPUI.
Discussion
Research Focus and Faculty Productivity
Federal-Funded Research Expenditures – By Agency
Big Ten Publics – FY2016
($ = Thousands)

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Reflects all reported expenditures, not just S&E. Indiana includes Bloomington & IUPUI.
Share of Federal Research Expenditures
By Government Agency – FY2016

Rutgers

- Health/Human Services: 58.5%
- NSF: 16.7%
- Defense: 4.8%
- Agriculture: 4.6%
- Energy: 12.1%

Big Ten Publics

- Health/Human Services: 44.2%
- NSF: 16.5%
- Defense: 12.5%
- Agriculture: 5.5%
- Energy: 8.1%
- NASA: 9.3%

Big Ten Top 3

- Health/Human Services: 48.9%
- NSF: 12.7%
- Defense: 17.0%
- Agriculture: 3.2%
- Energy: 7.4%
- Other: 6.8%

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Reflects all reported expenditures, not just S&E. Big Ten Publics percentages do not include Rutgers. Indiana includes Bloomington & IUPUI.
Total Research Expenditures – By Broad Discipline
Rutgers-New Brunswick – FY2010-FY2016
(% Shares)

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Reflects all reported expenditures, not just S&E.
Total Research Expenditures – By Broad Discipline
Big Ten Publics – FY2016
($=Thousands)

Michigan
Wisconsin
Minnesota
Penn State
Ohio State
Rutgers
Illinois
Michigan State
Purdue
Indiana
Maryland
Iowa
Nebraska

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Reflects all reported expenditures, not just S&E. Indiana includes Bloomington & IUPUI.
Total Research Expenditures – By Broad Discipline
Rutgers and Big Ten Publics – FY2016
(% Shares)

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Reflects all reported expenditures, not just S&E. Does not include ARRA expenditures. Big Ten Publics percentages do not include Rutgers.
Research Expenditures per Faculty
Big Ten Publics – FY2016

($=Thousands)

Michigan: $663
Wisconsin: $634
Penn State: $434
Minnesota: $433
Iowa: $396
Maryland: $374
Rutgers: $374
Ohio State: $370
Illinois: $340
Purdue: $330
Michigan State: $329
Nebraska: $273
Indiana: $251

Source: NSF R&D Expenditures at Universities and Colleges / Higher Education R&D Survey
Note: Reflects all reported expenditures, not just S&E. Indiana includes Bloomington & IUPUI. Fall 2015 faculty counts from IPEDS. These include full-time institutional employees — excluding medical schools — with faculty status who are on the tenure track or are tenured. Faculty count from IPEDS includes Instructional staff, primarily instruction, instruction/research/public service, research staff, and management staff. For institutions with medical schools, medical school faculty are included in faculty counts. Medical faculty counts are from the Association of American Medical Colleges.
Summary

• Rutgers is **around the median** in federal-funded research expenditures among the Big Ten Publics. Michigan, Wisconsin, and Penn State lead the Big Ten Publics, each with over a half-billion dollars in FY16.

• **Health/Human Services** research funding at Rutgers increased significantly in FY14 as a result of the merger. Life Science research expenditures at Rutgers increased significantly as a result.

• Compared to its Big Ten peers, Rutgers receives a **relatively small share** of its federal funding from the Department of Defense, Department of Energy, and NASA, and a relatively large share from Health/Human Services.

• Compared to its Big Ten peers, Rutgers expenditure in **Engineering** and **Non-Science/Engineering** is **relatively small**, whereas in **Life Science** and **Geo/Atmospheric/Ocean Sciences** it is **relatively large**.
Discussion
Research Recognition and Capacity
Number of Members in the American Academy of Arts & Sciences
Big Ten Publics – January 2018

Note: Includes all active and retired members.
Number of Members in the American Association for the Advancement of Science
Big Ten Publics – January 2018

<table>
<thead>
<tr>
<th>University</th>
<th>Number of Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>101</td>
</tr>
<tr>
<td>Ohio State</td>
<td>93</td>
</tr>
<tr>
<td>Rutgers</td>
<td>76</td>
</tr>
<tr>
<td>Illinois</td>
<td>69</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>65</td>
</tr>
<tr>
<td>Minnesota</td>
<td>63</td>
</tr>
<tr>
<td>Penn State</td>
<td>60</td>
</tr>
<tr>
<td>Purdue</td>
<td>56</td>
</tr>
<tr>
<td>Indiana</td>
<td>47</td>
</tr>
<tr>
<td>Maryland</td>
<td>44</td>
</tr>
<tr>
<td>Michigan State</td>
<td>37</td>
</tr>
<tr>
<td>Nebraska</td>
<td>33</td>
</tr>
<tr>
<td>Iowa</td>
<td>22</td>
</tr>
</tbody>
</table>
Number of Members in the National Academies
Big Ten Publics – January 2018

Includes:
• National Academy of Sciences
• National Academy of Engineering
• National Academy of Medicine

Note: Membership counts from National Academy of Sciences, Engineering, and Medicine. Includes all active and retired members. Faculty can belong to more than one academy. Duplicate counts between academies can exist.
Other Prestigious Faculty Awards
Big Ten Publics – 2015

Example Awards:
• American Council of Learned Societies (ACLS) Fellows
• Fulbright American Scholars
• Getty Scholars in Residence
• Guggenheim Fellows
• National Endowment for the Humanities (NEH) Fellows
• National Medal of Science and National Medal of Technology
• Robert Wood Johnson Policy Fellows
• Sloan Research Fellows
• Woodrow Wilson Fellows

Source: https://mup.asu.edu/sites/default/files/mup-2016-top-american-research-universities-annual-report.pdf
Note: Indiana includes Bloomington and IUPUI. Explanation of faculty awards methodology on pg. 227 of The Top American Research Universities, 2016 Annual Report.
Federal Awards for Science and Engineering Fellowships, Traineeships, and Training Grants

Big Ten Publics – FY2015

($=Thousands)

Source: NSF Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions

Note: Indiana reflects Bloomington. For NSF survey, the target population was all federal agencies that obligated money in FY 2015 to academic or nonprofit institutions or consortia for S&E R&D or the construction or maintenance of R&D facilities.
<table>
<thead>
<tr>
<th>State</th>
<th>Graduate Students</th>
<th>Postdoctorates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>7,494</td>
<td>391</td>
</tr>
<tr>
<td>Purdue</td>
<td>7,397</td>
<td>542</td>
</tr>
<tr>
<td>Illinois</td>
<td>6,570</td>
<td>765</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>5,959</td>
<td>775</td>
</tr>
<tr>
<td>Minnesota</td>
<td>5,565</td>
<td>5,696</td>
</tr>
<tr>
<td>Maryland</td>
<td>5,754</td>
<td>496</td>
</tr>
<tr>
<td>Ohio State</td>
<td>5,257</td>
<td>619</td>
</tr>
<tr>
<td>Indiana</td>
<td>5,204</td>
<td>394</td>
</tr>
<tr>
<td>Rutgers</td>
<td>4,855</td>
<td>362</td>
</tr>
<tr>
<td>Penn State</td>
<td>4,633</td>
<td>436</td>
</tr>
<tr>
<td>Michigan State</td>
<td>3,569</td>
<td>471</td>
</tr>
<tr>
<td>Nebraska</td>
<td>2,251</td>
<td>205</td>
</tr>
<tr>
<td>Iowa</td>
<td>1,927</td>
<td>346</td>
</tr>
</tbody>
</table>

Source: NSF-NIH Survey of Graduate Students & Postdoctorates in Science and Engineering
Note: Indiana is system wide figure; campus level figures were unavailable. NSF reported Rutgers figure reflects university wide totals.
Number of NSF Graduate Research Fellowships
Big Ten Publics – 2017

Source: NSF GRFP Awardee List 2017
Number of PhD Degrees Awarded
Big Ten Publics – AY 2015-2016

Source: IPEDS Completions Survey
Note: Doctoral degrees may include Ph.D., Ed.D., D.M.A., D.B.A., D.Sc., D.A., or D.M, and others, as designated by the awarding institution.
Research Space - By Field
Big Ten Publics – FY2015
Square Feet (NASF)

Source: NSF Survey of Science and Engineering Research Facilities
Note: Reflects all reported expenditures, not just S&E. Rutgers figures reflect FY2017. Indiana reflects Bloomington.
Discussion
Research Support (ORED)
Average Number of All Grant Proposals Submitted Over Four Years

Big Ten Publics
FY2014 - FY2017

Source: Big Ten Academic Alliance Research Database.
Note: Note: Due to missing data points, Ohio State’s average number of proposals does not include 2015 and 2017.
Average Amount of All Grant Proposals Submitted Over Four Years
Big Ten Publics – FY2014 - FY2017
($=Millions)

Source: Big Ten Academic Alliance Research Database.
Note: Due to missing data points, Ohio State’s average amount does not include 2015.
Average Number of All Grants Awarded Over Four Years

Big Ten Publics

FY2014 - FY2017

Wisconsin: 7,058
Maryland: 5,833
Ohio State: 5,389
Minnesota: 4,696
Purdue: 4,039
Illinois: 4,032
Penn State: 3,783
Michigan: 3,388
Indiana: 2,855
Michigan State: 2,562
Rutgers: 2,462
Iowa: 2,306
Nebraska: 1,385

Source: Big Ten Academic Alliance Research Database.
Note: Due to missing data points, Ohio State's average number of awards does not include 2017.
Average Amount of All Grants Awarded Over Four Years
Big Ten Publics – FY2014 - FY2017
($=Thousands)

Source: Big Ten Academic Alliance Research Database.
Note: Note: Due to missing data points, Ohio State’s average amount does not include 2015.
Average Amount per Award Over Four Years

Big Ten Publics
FY2014 - FY2017

Source: Big Ten Academic Alliance Research Database.
Note: Due to missing data points, Ohio State's average award amount does not include 2017.
Technology Transfer Metrics
Rutgers–New Brunswick
FY2006 - FY2017

Disclosures Received
US Patents Issued
Licenses Issued
Start-ups Formed

Integration

Gross License Income

Source: Association of University Technology Managers, Statistics Access for Technology Transfer (STATT) Database.
Tech Transfer
Big Ten Publics – FY2014 - FY2016
3-Year Average

Source: Association of University Technology Managers, Statistics Access for Technology Transfer (STATT) Database.
Note: Big Ten average excludes University of Maryland System.
Discussion
Some Ideas to Spur Research Growth
Rutgers at or near aspirant group in math, physics – but lags in chemistry and biological sciences.

Preserve our best-in-class strengths.

Social sciences around the average of peer schools.

Rutgers lags peers in critical large disciplines.

Spur research growth in areas where we have a sub-peer research footprint.

Preserve our best-in-class Humanities disciplines.

Rutgers equals best in class in key humanities disciplines.

Source: University-wide Strategic Plan – 2014
Growing Rutgers’ Research

• **Strategic Initiatives:**
  Seek resonance with federal/state/industrial/foundation opportunities
  ➔ Increase # strategic grant submissions

• **Coalescing Teams:**
  Mobilize RU-NB faculty to develop a critical mass around areas of strength
  ➔ Enhance collaborative and competitive edge

• **Research Capacity:**
  Expand training program support for graduate students and postdocs.
  ➔ Invigorate our research ethos and increase # PhDs
Vice Chancellor for Research & Innovation
Rutgers University–New Brunswick

• Recognize high quality research/grants/initiatives
• Develop faculty mentoring mechanisms
• Ideate new research initiatives and centers across RU-NB
• Seed and assist new training programs (predoctoral, postdoctoral)
• Oversee the growth of current research centers and the next phase
• Develop strategic research partnerships with industry
• Align RU-NB research to federal and state research agency opportunities
Nucleating the next wave of collaborative research initiatives

The VCRI and the leadership team will engage with RU-NB faculty to nucleate research initiatives where we can be most competitive. The goal is to be broad and inclusive while anchoring around our existing and emergent strengths.

A few examples:

• Advanced Materials Initiative
• The Microbiome Project
• Bio/Pharma Manufacturing Institute
• Energy & Sustainability Initiatives
• Security and the Human Element
• …
Anchoring Team Research Around Multiple RU–NB Nodes
A sampling of possible ideation landscapes…
Anchoring Team Research Around Multiple RU–NB Nodes

A sampling of possible ideation landscapes…
To this end, we used corals may be able to sustain calcification even under lower pH conditions that do not calcifying fluid chemistry, whereas biologists discussed for decades without the emergence of unprecedented insights into the relation between the process by which stony corals deposit minerals. There are two prevailing hypotheses: Geochemists generally argue for a physicochemically dominated process, whereas biologists, in particular, argue for a biologically controlled process. All stony corals form densely packed ordered structures, which appear to be enriched in organic compounds. The process is initiated by the formation of a transient disordered precursor phase, which is reminiscent of the well-known ACC precursor nanoparticles are deposited inside vesicles. The ACC nanoparticles then further aggregate and serve as building blocks for the calcification process. They migrate from the COCs, lose magnesium, and they are rich in magnesium. The ACC particles are transformed into aragonite crystals form densely packed ordered structures, which appear to be enriched in organic compounds. The ACC nanoparticles are transformed into aragonite crystals.

**Biological formation**

**Biological control of aragonite formation in stony corals**

Stanislas Von Euw, Qihong Zhang, Viacheslav Manichev, Nagarajan Murali, Juliane Gross, Leonard C. Feldman, Torgny Gustafsson, Carol Flach, Richard Mendelsohn, Paul G. Falkowski


Advanced Research Infrastructure at RU-NB: Helium Ion Microscope
Vice Chancellor for Research & Innovation
We welcome your ideas and engagement

Vice Chancellor for Research & Innovation
Rutgers University—New Brunswick

- Recognize high quality research/grants/initiatives
- Develop faculty mentoring mechanisms
- Ideate new research initiatives and centers
- Seed and assist new training programs (predoctoral, postdoctoral)
- Oversee the growth of current research centers and next phase
- Develop strategic research partnerships with industry
- Align RU-NB research to federal and state research agency opportunities

VP for Research & Economic Development
Rutgers University

- Pre- and post-award grants support
- Research analytics
- IP and Commercialization
- Economic Development/outreach to industries
- Regulatory Affairs
- Animal Facilities (IACUC)
- Research Computing Services
- Innovation Park

OVCR1 - ORED
Questions/Comments?

Ideas for Future Conversations?

THANK YOU!