Enabling Translational Research at Rutgers University

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Associate Vice President
Office of Research Commercialization

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Executive Director, Strategic Alliances
Rutgers Translational Sciences
**Mission**

Transform research at Rutgers into products, services and partnerships for the public good, generating value for the University and enhancing economic development in the State of New Jersey.

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**Faculty**

- Proof of concept data
  - research grants
  - research contracts
  - research collaborations
- POC funding
- Patenting
- Spinouts

**Administration**

- Protect University interests
- Intellectual property
- Licensing
- Public private partnerships
- Outreach to business
- Build RU stature

**Public**

- Take Rutgers to premier status as public university with academic medical center
**Mission**

*Transform research at Rutgers into products, services and partnerships for the public good, generating value for the University and enhancing economic development in the State of New Jersey.*

- **Rutgers Translational Sciences**
  
  Assist faculty in bridging the gap between basic research and the clinic; generates competitive preliminary data for grants & collaborations.

- **Technology Commercialization**
  
  Manage technology lifecycle for Rutgers inventions from conception through patenting, marketing and licensing.

- **Corporate Engagement**
  
  Build corporate relationships, collaborations and partnerships.

- **New Ventures & Entrepreneurship**
  
  Create a culture of entrepreneurship and support startup companies.
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### BIG 10 stats by Licensing Revenues

<table>
<thead>
<tr>
<th>University</th>
<th>License Revenues</th>
<th>Tech Disclosures</th>
<th>Research Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$Million</td>
<td></td>
<td>$ Million</td>
</tr>
<tr>
<td>Northwestern</td>
<td>122.1</td>
<td>166</td>
<td>682</td>
</tr>
<tr>
<td>U. Minnesota</td>
<td>45.6</td>
<td>221</td>
<td>850</td>
</tr>
<tr>
<td>U. Wisconsin (WARF)</td>
<td>41.1</td>
<td>373</td>
<td>1,190</td>
</tr>
<tr>
<td>U. Illinois - Urbana</td>
<td>21.4</td>
<td>407</td>
<td>972§</td>
</tr>
<tr>
<td><strong>RUTGERS</strong></td>
<td><strong>16.7</strong></td>
<td><strong>218</strong></td>
<td><strong>744</strong></td>
</tr>
<tr>
<td>U. Michigan</td>
<td>13.9</td>
<td>368</td>
<td>1,274</td>
</tr>
<tr>
<td>U. Nebraska - Lincoln</td>
<td>9.5</td>
<td>265</td>
<td>395</td>
</tr>
<tr>
<td>U. Iowa</td>
<td>7.2</td>
<td>102</td>
<td>446</td>
</tr>
<tr>
<td>Indiana U.</td>
<td>7.1</td>
<td>202</td>
<td>454</td>
</tr>
<tr>
<td>Purdue</td>
<td>4.9</td>
<td>356</td>
<td>628</td>
</tr>
<tr>
<td>Michigan State</td>
<td>3.7</td>
<td>127</td>
<td>507</td>
</tr>
<tr>
<td>Penn State</td>
<td>3.1</td>
<td>132</td>
<td>808</td>
</tr>
<tr>
<td>Ohio State</td>
<td>2.1</td>
<td>319</td>
<td>934</td>
</tr>
<tr>
<td>U. Maryland -College Park</td>
<td>0.7</td>
<td>292</td>
<td>468</td>
</tr>
<tr>
<td><strong>RUTGERS Rank</strong></td>
<td><strong>5</strong></td>
<td><strong>9</strong></td>
<td><strong>7</strong></td>
</tr>
</tbody>
</table>

*All FY 2012, except Rutgers FY 2013*

- §U. Illinois campus reporting not AUTM numbers
- All have medical schools except Purdue (has veterinary medicine program)
What is a patent?

- Commercial instrument, not a scientific document
  - Prevents others from practicing the invention
  - Limited period of exclusivity

- Inventor Discloses
  - What the invention is
  - How to “practice” the invention
  - What the invention encompasses (claims)

- Requirements for patentable subject matter
  - Proper subject matter
  - Utility
  - Novelty
  - Nonobviousness
Rutgers University Patenting Process

*Technology may be returned to Inventor with a report at decision points.*
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Central Point of Entry for Industry

BusinessPortal.rutgers.edu

Collaborate With Us

Search Scholar Universe

Let's Get Started
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New Ventures & Entrepreneurship
Create a culture of entrepreneurship and support startup companies.
Mission:

• To advance commercialization of Rutgers intellectual property via the creation of start-up companies and other entrepreneurial initiatives

• To promote entrepreneurship and facilitate entrepreneurship activities within the Rutgers community

• To identify and pursue funding sources to advance the commercialization of Rutgers technologies.
Pharma, Biotech and a Professor of Translational Research
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RU Strengths: Basic & Clinical Science

Translational Research in Academia

Pathways
Basic Research
- Genetics
- Biochemistry
- Chemistry
- Molecular Biology
- Structural Biology
- Neuroscience
- Microbiology
- Oncology
- Molecular Pharmacology
- Comparative Medicine

Probes
Translational Sciences
- Medicinal Chemistry
- Molecular Imaging
- Metabolomics
- in vivo Pharmacology
- Toxicology
- Proteomics
- Biomarkers
- Histopathology
- Screening

Therapies
Clinical Research
- Development-enabling Studies
- Clinical Development
- Clinical Trials
- Clinical Practice
- Clinical Outcomes
Transforming Basic Science

Equipment, Facilities, Technologies, Foundational Support

Bridging Capabilities

Pathways

Basic Research
- Genetics
- Biochemistry
- Chemistry
- Molecular Biology
- Structural Biology
- Neuroscience
- Microbiology
- Oncology
- Molecular Pharmacology
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Clinical Research
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- Clinical Development
- Clinical Trials
- Clinical Practice
- Clinical Outcomes
Year 1: PD2 program at Lilly identifies active structure that increases apoE secretion from astrocytes. Invent a molecule with increased potency and oral exposure ($300K grant from ADDF)

Year 2: Obtain exploratory toxicology data and test in animal model of Alzheimer’s Disease ($300K grant from ADDF)

More funding? Nonclinical development?
Bridging & Collaborative Research Cores

- centrally organized
- professional staff
- mission is to enable biomedical research

Molecular Design and Synthesis

Molecular Imaging Center

Research Pathology Services

Fragment Library
FDA-approved Drugs
Director: David Augeri, Ph.D.
22 years experience in pharma and biopharma
Inventor of saxigliptin (Onglyza®; ca $1B annual sales)
Capabilities:
- MRI
- PET/CT
- microCT
- Ultrasound
- Radiography
- 3D Reconstruction
- Whole Body Fluorescence

Active Research Projects:
- Glucose uptake by the brain
- Air volume / fibrosis in the lung
- Mineral density in bones
- 3D bone / tissue printing
- Muscle atrophy
- Traumatic Brain Injury
- Blood flow to kidneys
- Blood vessel disease
- Nucleated ice crystal structure
- Water filter cartridges
- Salamander ear structure
- Tumor size / growth / burden
- Contrast agent development
- Structure of teeth / cavities

Executive Director: Ed Yurkow, Ph.D.
Associate Professor EMSOP Pharmacology/Toxicology 1989 -1999
13 years experience in pharma and biopharma
RTS: Research Pathology Services

Expertise, Analysis
Enabling Data
Funded Research

Necropsy
Tissue processing
Staining
Histopathology
Imaging
Document review
Data analysis
Immunohistochemistry
Clinical pathology
Electron microscopy

Director: Michael Goedken, DVM, Ph.D.
Immunologist with 9 years experience in pharma and biopharma
Board certified veterinary pathologist with IND submission experience
RTS: Capabilities Fit to Rutgers’ Needs

New Jersey Health Foundation
School of Environmental & Biological Sciences
Institute for Integrative Proteomics
Cancer Institute of New Jersey
Office of Research & Economic Development

Pathways
Basic Research
Genetics
Biochemistry
Chemistry
Molecular Biology
Structural Biology
Neuroscience
Microbiology
Oncology
Molecular Pharmacology

Probes
Translational Sciences
Medicinal Chemistry
Imaging
Metabolomics
in vivo Pharmacology
Toxicology
Proteomics
Biomarkers
Histopathology
Screening

Fragment Library: SEBS
(sebs.rutgers.edu/core-facility)

FDA-approved Drugs: RTS
(rts.rutgers.edu)
Enabling Translational Research

Mission Statement

Rutgers Translational Sciences (RTS) bridges the gap between basic and interdisciplinary preclinical research for Rutgers faculty. Professional staff help faculty create translational data for more competitive biomedical grant submissions, and increase collaboration with the private sector.

- Enable data generation for grant applications and publications
- Interface between Rutgers and the private sector
- Bolster the success of NJ biomedical companies

Research Capabilities

The Molecular Design & Synthesis Laboratory focuses on the preparation of small molecule probes to new biology.

The Molecular Imaging Center provides a non-invasive approach to study various biological and disease models in living systems and ex vivo organs.

The Research Pathology Services team supports research in animal models of human disease by providing veterinary pathology services.

RTS in the News

Chemical & Engineering News
Tech News
CCDC Newsletter
InnovationNJ

FIND Research at Rutgers

Collaborations

Internal Collaborations

CTNJ
RTS has several ongoing research projects with the Cancer Institute of New Jersey. These include projects to:

- Reactivate mutant p53 protein, which is commonly disabled in human cancers
- Inhibit growth of cancerous multiple myeloma cells
- Block the effects of the BMI-1 oncogene, which is important in tumor initiation, progression and resistance
- Antagonize bone morphogenetic protein-2, which promotes tumor progression
- Inhibit NAD kinase, which is important in providing energy to cancer cells

These efforts are aimed at discovering small molecule probes that will elucidate cancer pathways and provide researchers at the Cancer Institute new insights into biological processes.

m3nj.rutgers.edu

External Collaborations

MitoPharm
A highly experienced team of medicinal chemists from RTS is working on derivatizing MT-2 (a small molecule compound with excellent safety profile) and generating novel groups of small molecule compounds with diverse pharmacokinetic and pharmacodynamic properties. The new pipeline of candidate compounds is expected to feed the need for better treatments of metabolic diseases as well as for treating other diseases with mitochondrial root.

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Collaborative Grant Applications

STTR Grants
- In vitro Screening Strategy for Anti-Fibrotic Therapeutics (with Matricell Therapeutics)

NIH Grants
- Developing BMP Antagonists for the Treatment of Cancer

BuCh Biomedical Grant Collaborations
- Developing BMP Antagonists for the Treatment of Cancer
- Validation of a Technology to Accelerate Imaging Probe Development

rts.rutgers.edu
“Could you kindly pick up the tempo a bit?”
Thank You

orc.rutgers.edu
Home pages
ored.rutgers.edu
businessportal.rutgers.edu

Listings of Core Facilities
guide.ored.rutgers.edu
njms.rutgers.edu/research/resources
rwjms.rutgers.edu/research/core_facilities

Centers & Institutes
rutgers.edu/research/centers-institutes

Comparative Medicine Resources
orad.rutgers.edu

Translational Sciences
rts.rutgers.edu

Contact Information:
TranslationalScience@Rutgers.edu