

Penn State and life science technologies

From lab to market, how Penn State inventions
are saving lives & creating prosperity

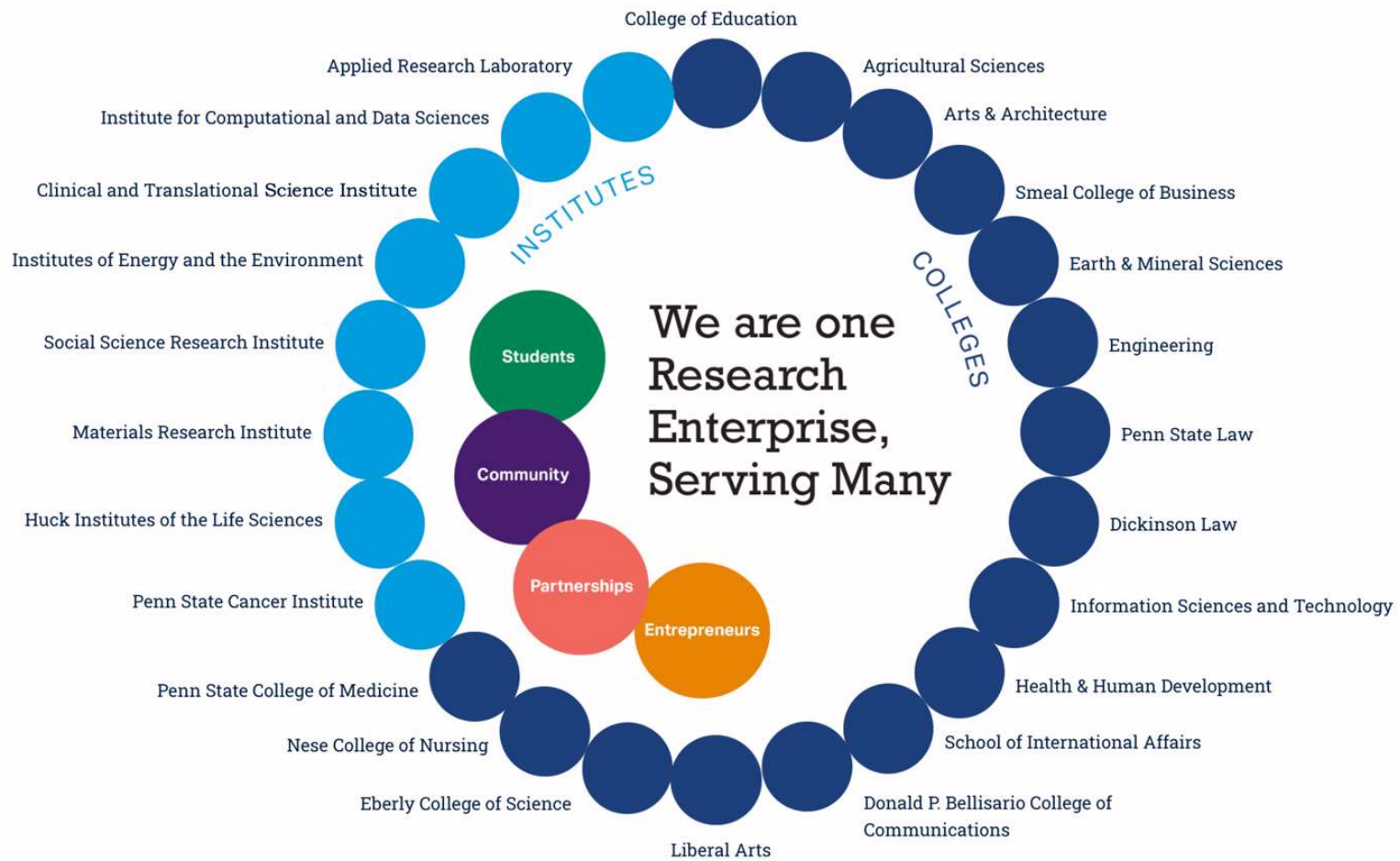
Bin Yan, PhD, JD

*Associate Vice President for Research,
Director of Office of Technology Transfer*

April 1, 2025



PennState



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Twelve Disciplines Ranked in U.S. Top 10 for Research

- #2 Materials Engineering
- #2 Mechanical Engineering
- #3 Materials Science
- #3 Electrical Engineering
- #4 Sociology
- #5 Psychology
- #6 Bioengineering & Biomedical Engineering
- #6 Total Engineering
- #8 Aeronautical & Astronautical Engineering
- #8 Computer & Information Sciences
- #9 Mathematics & Statistics
- #10 Atmospheric/Meteorology

12
Programs
in the Top 10

Ranked 28
nationwide for
research
expenditures



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A Strong History of Innovation within Life Sciences

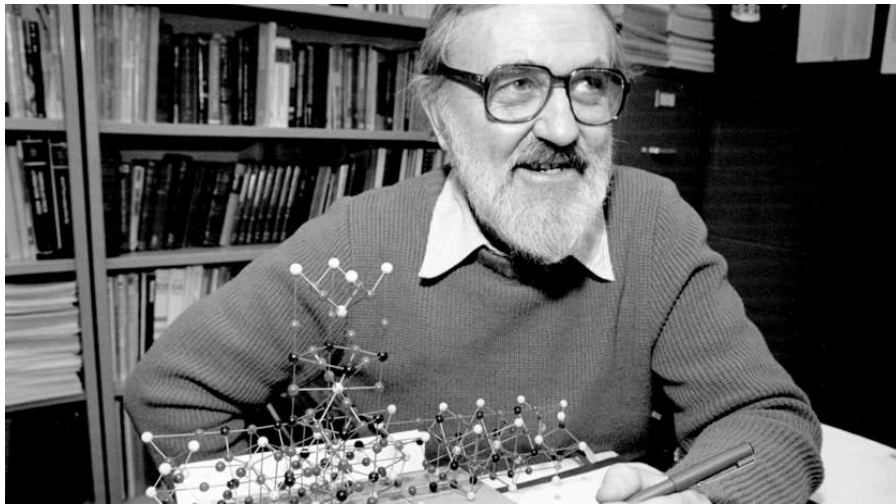
Penn State inventions with global and local impact



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"The American Ultrasound Valley"

Researchers from Penn State invented transducers that are used in nearly all medical ultrasound devices.



Dr. L. Eric Cross, Evan Pugh Professor Emeritus of Electrical Engineering and inventor of transducers used in ultrasound equipment

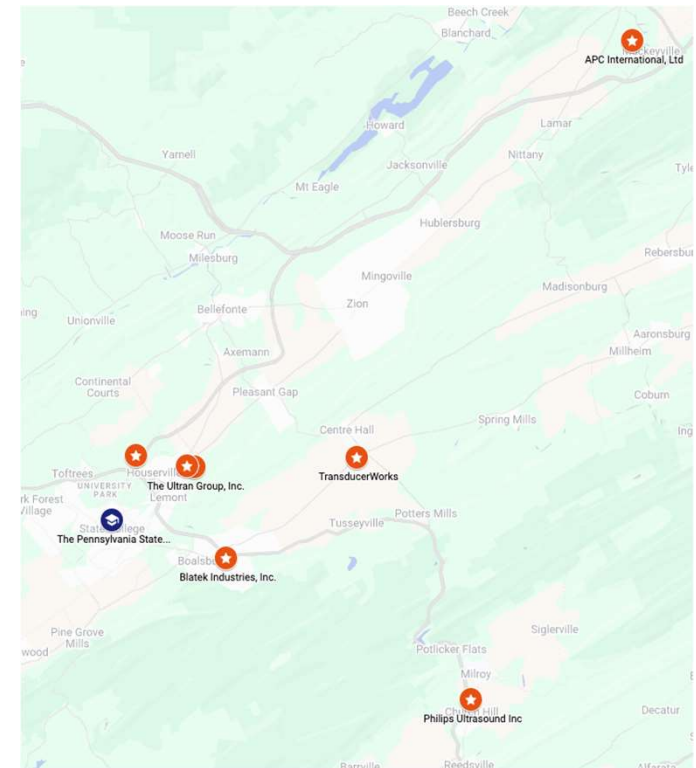


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"The American Ultrasound Valley"

Global impact, strong local industry

- Philips Ultrasound
 - Reedsville, PA – 400+ employees
- Transducer Works (part of Vermon Group)
 - Centre Hall, PA – 90+ employees
- Blatek Industries
 - Boalsburg, PA – 50+ employees
- Ultran Group
 - State College, PA – 10+ employees
- *and more....*



Some of the Ultrasound Technology Companies within 50 miles of Penn State University Park campus

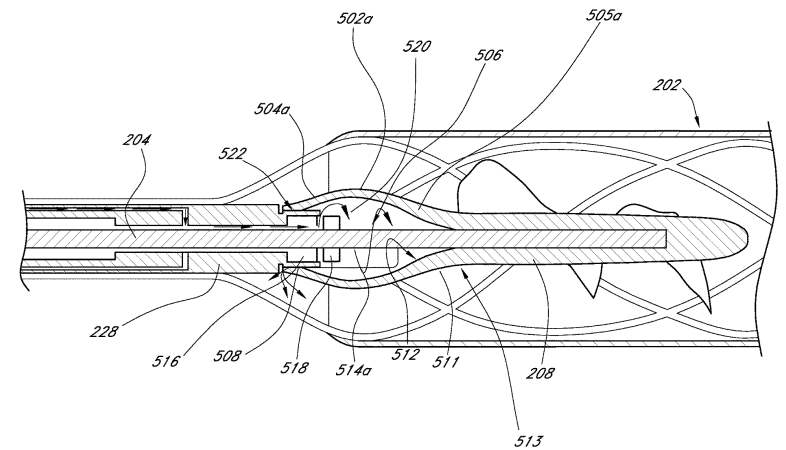


Innovation in Cardiovascular Research

Penn State is an international leader in the research, development, and clinical use of heart pumps and artificial hearts.



Three members of the interdisciplinary team that developed the heart-assist pump, from left: Gerson Rosenberg, Dr. William S. Pierce, and James H. Donachy (1992).



Patent drawing of a heart pump catheter developed at Penn State



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Enabling the HPV Vaccine

Dr. Neil Christensen discovered neutralizing monoclonal antibodies for the human papillomavirus (HPV) which led to the development of the original HPV vaccine.



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Emerging Innovations

New Penn State derived technologies and their impact
within the Life Sciences



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Next Generation Orthopedic Devices

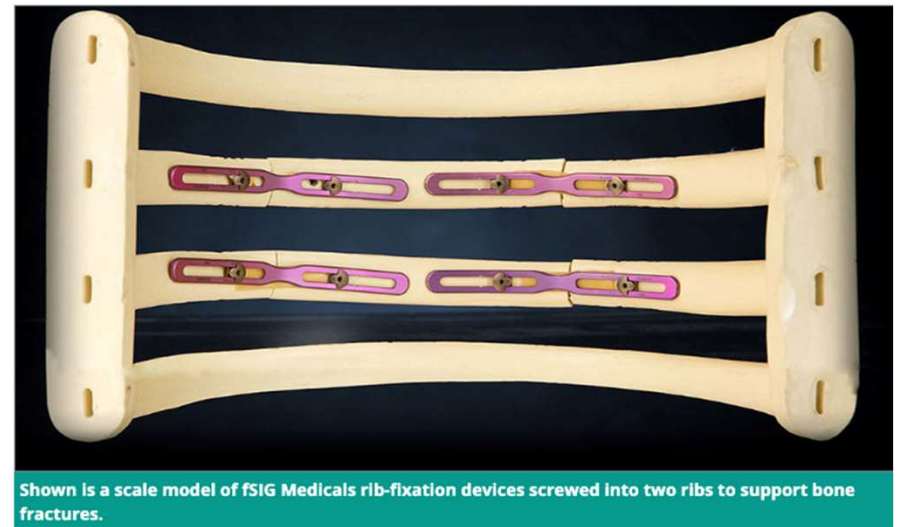
Penn State technology is actively being commercialized by USA-based orthopedic companies.

- Zimmer Biomet – Warsaw, IN
- Acuitive Technologies – Allendale, NJ

Recently approved by the U.S. Food and Drug Administration, this surgical screw secretes citrate to help damaged tissue heal.
Credit: ACUITIVE TECHNOLOGIES. All Rights Reserved.



Penn State-developed technology for surgically mending broken ribs purchased by orthopedics company



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Commercially Successful Pest Control

Penn State spinout ConidioTec has brought their leading bed bug biopesticide, Aprehend, to market.

- Originated in PSU College of Agriculture
- Used in all 50 states and around the world
- HQ in Centre Hall, PA
- Recently featured in the BBC and Time Magazine
- Bed Bug treatment = ~\$2.5B industry



Aprehend[®]
Ready to use

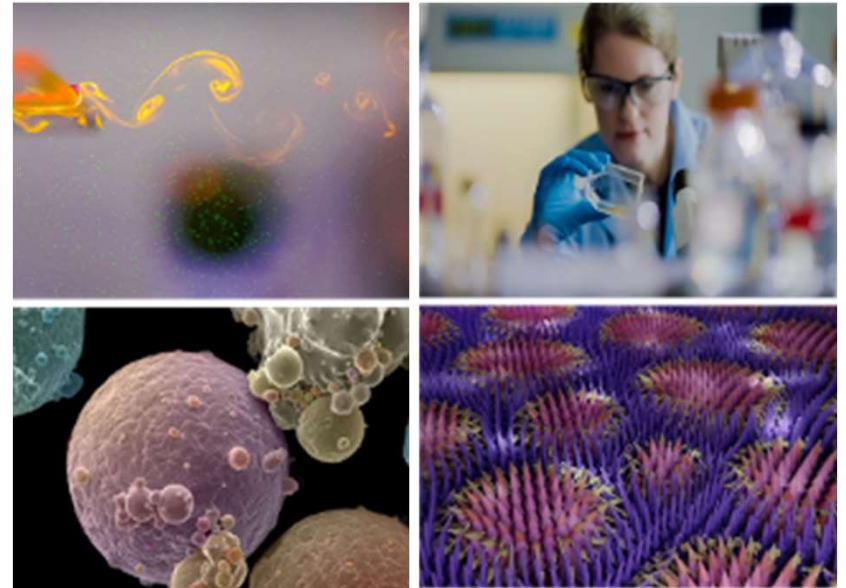


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Protecting Against Diseases

Penn State technologies in the drug development pipeline include those that can protect against:

- Alzheimer's Disease
- Strokes
- Traumatic Nerve Injuries
- Respiratory Infections
- Various Cancers
- *and more...*



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Accelerating Translational Research

Opportunities & Challenges in Moving Penn State
Technology Out of the Lab and into the Market



Lab-to-Market Opportunities & Challenges

Opportunities:

- Industry Partnerships
 - Penn State has had 2,000+ industry partnerships in the last decade
- Significant upside
 - In 2023, Purdue University received \$100M+ for its royalty interests in cancer therapies

Challenges:

- Long time-horizon
 - Between 1-18+ years from invention to revenue
- Retaining talent
 - Inventors are often grad-students or postdocs, of which ~42% are international students at Penn State



How Might We Advance Technology Transfer Across the Commonwealth?



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Technology Transfer: Amplifying the Impact of Penn State Research

Bin Yan, PhD, JD
Associate Vice President for Research
Director, Office of Technology Transfer
byan@psu.edu



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