



Changing Medicine, Changing Lives

KKNA Introduction
November 2024



Global Vision

Our Vision toward 2030

Kyowa Kirin will realize the successful creation and delivery of life-changing value that ultimately makes people smile, as a Japan-based Global Specialty Pharmaceutical company built on the diverse team of experts with shared passion for innovation.

Provide pharmaceuticals for unmet medical needs

We are focused on developing medicines for diseases where there is a clear patient need for new options. We make full use of multiple therapeutic modalities, including biotechnology such as antibody technology, and beyond, building on our Kyowa Kirin established strengths.

Address patient-centric healthcare needs

We will meet the needs of patients and society by providing value across the entire patient care pathway, delivering cutting-edge science and technology, grounded in our in-depth pharmaceutical knowledge and expertise.

Retain the trust of society

We pursue world-class product quality and operational excellence to grow our business in ways which build long-term trust with our stakeholders.



Four core values drive all we do and who we are





KYOWA KIRIN

North America

We are a **Japan-based global specialty pharmaceutical company** backed by more than 70 years of pioneering science and breakthrough innovation.

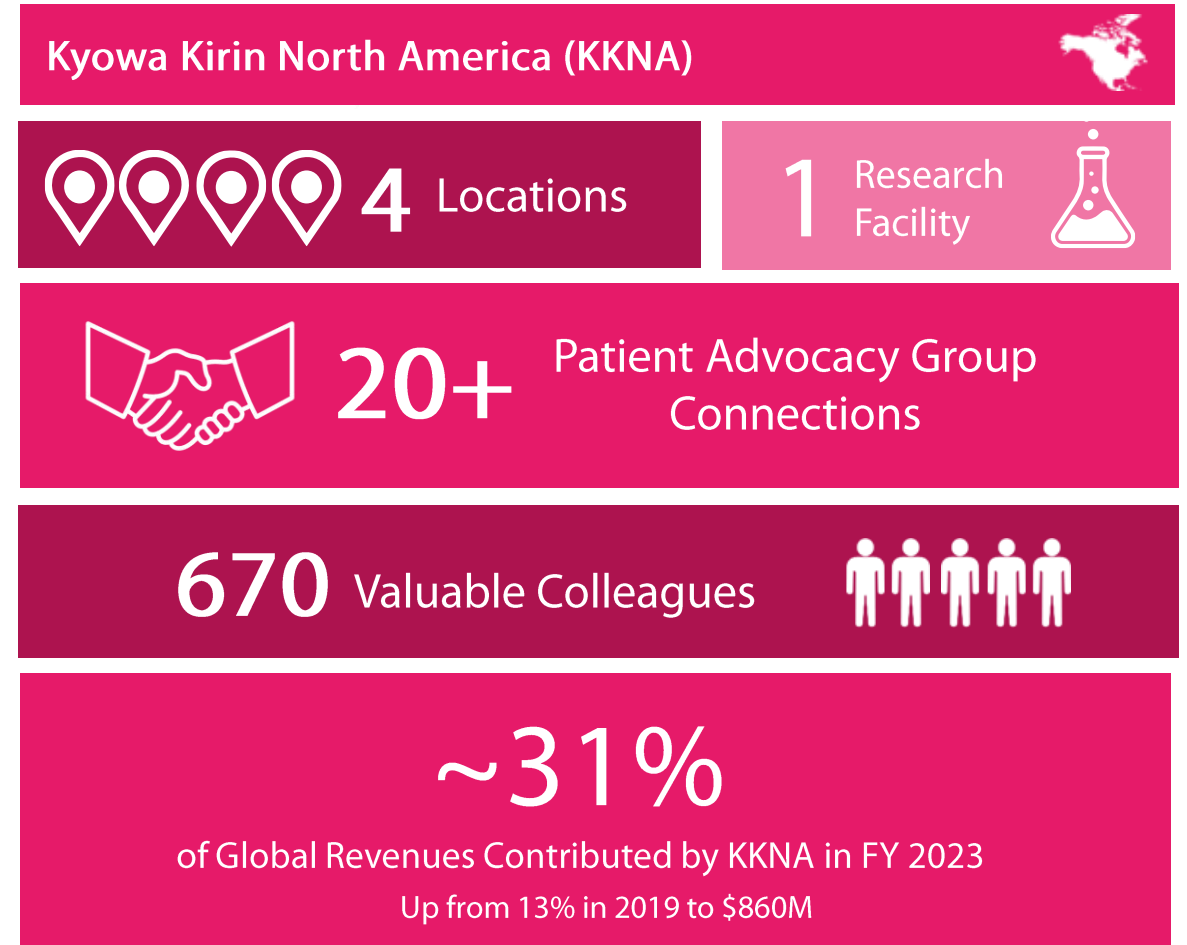
Our team is working to engineer the next generation of antibodies, cell and gene therapies with the potential to **deliver life-changing value to patients living with underserved and rare diseases.**

A shared commitment to our values, building relationships, and **making people smile** unites us, as one team.

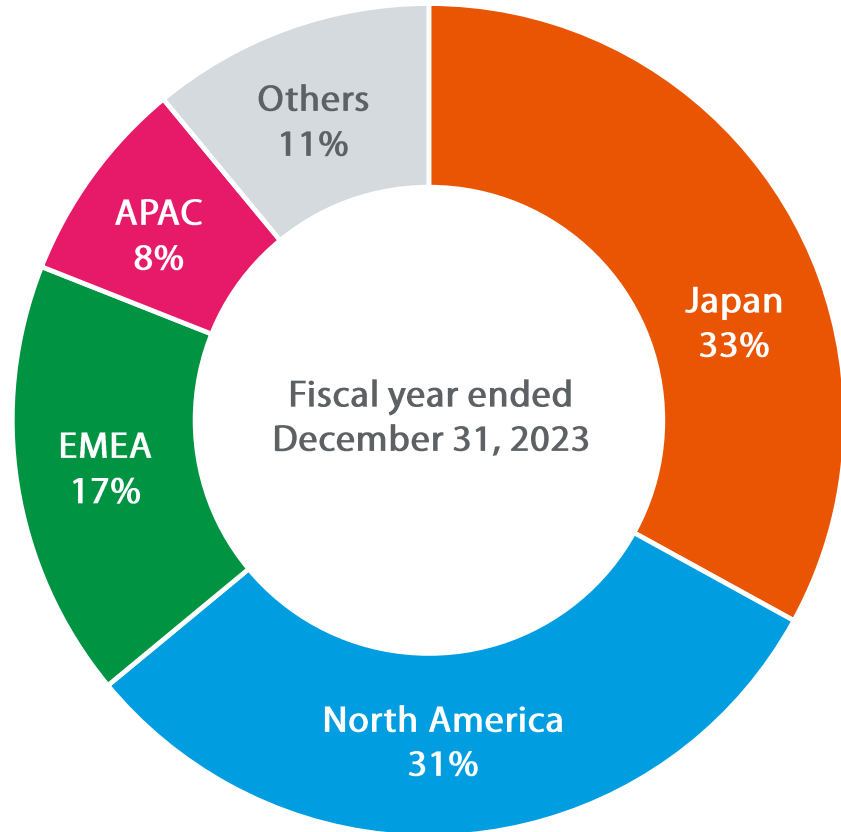
We will take advantage of our size, focus, data and empathy to solve the problems that matter most to our patients. And in doing so, become the world's **most admired and trusted rare disease company.**

North America Pioneers New Capabilities to Support Global Growth

Across four locations in North America, we work from discovery to development to commercialization with the unifying goal of having a profound impact on the lives of patients, families, and communities.



KKNA revenue contribution to the global business is growing



In 2023, Kyowa Kirin North America accounted for 31% of the company's total global revenues – up from 13% in 2019.

Four locations

- Headquarters: Princeton, NJ
- Research: La Jolla, CA
- Offices: Mississauga, Ontario
- Manufacturing: Coming soon to North Carolina

Patient needs are at the heart of our business

We are distinguished by our long-standing commitment and relationships with patient organizations, which are grounded in a shared interest to help patients access better care and treatment options.

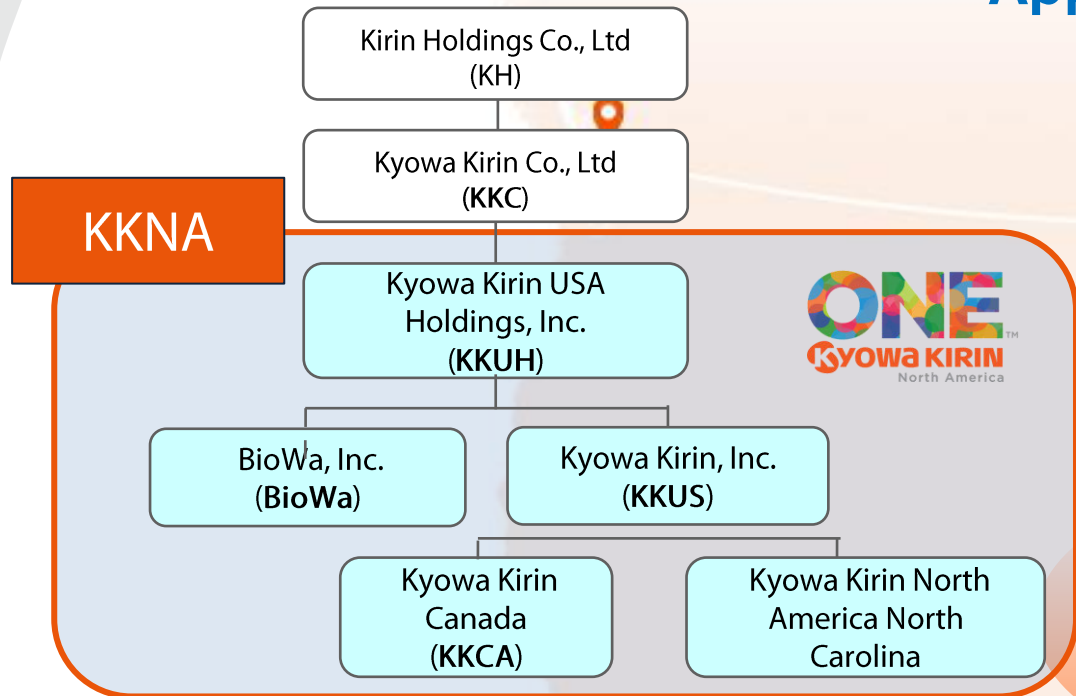
WORKING TOGETHER TO HAVE A PROFOUND IMPACT



Kyowa Kirin North America Human Resources

Kyowa Kirin North America (KKNA)

Approx 670 Employees (as of 10/31/24)



Canada
15~people



Boston
30~people
(1 Expat)



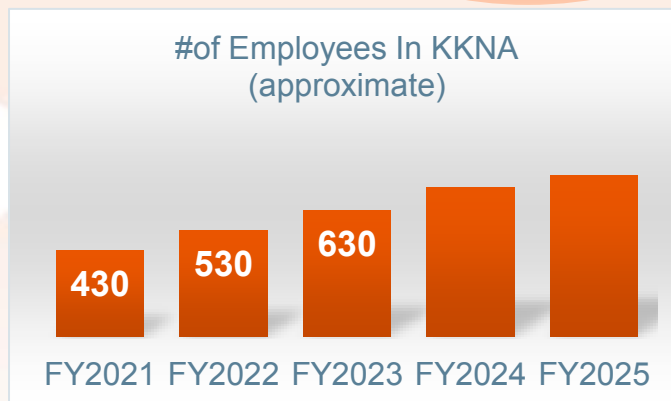
Field Sales/Remote
200~people



Princeton
300~people
(36 Expats)



San Diego
50~people
(7 Expats)



North Carolina
20~people
(1 Expat)

Function	Expats
MA	1
RA	1
QA	1
PV	4
BD	2
Research	7
Development	13
Manufacturing	3
GPM	7
CP	1
Finance	1
HR	1
ICT	2
Grand Total	44

Why Kyowa Kirin Chose NJ

New Jersey is home to over 3,000 pharmaceutical companies

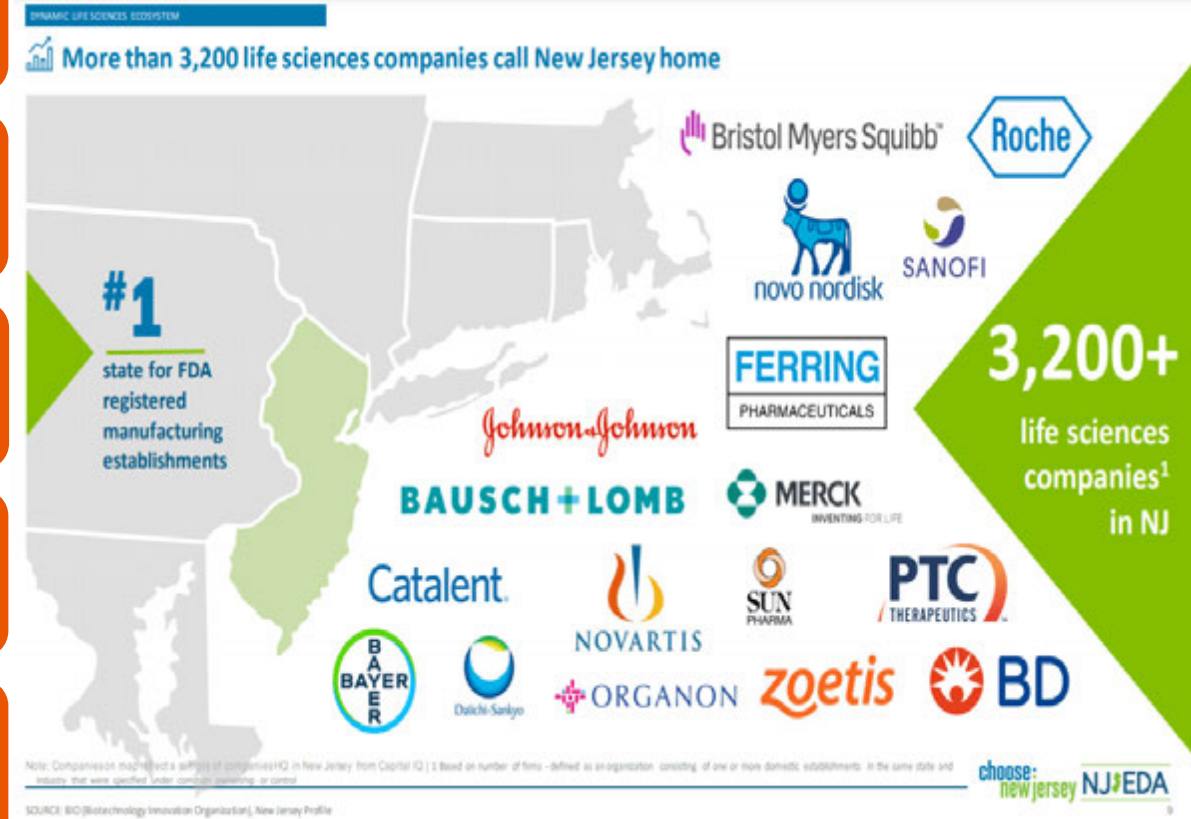
Includes 14 of the top 20 largest pharmaceutical companies in the United States

New Jersey is ideally located between Philadelphia & New York City on the Interstate 95 corridor and Princeton is easily accessible via train

In New Jersey, 43.8% of the population has a bachelor's degree or higher which is significantly higher than the national rate of 33.7%

LinkedIn reports over 116,000 professionals work in the Pharmaceutical industry in New Jersey

LinkedIn reports gender balance in the industry in NJ 51% female and 49% male



KYOWA KIRIN

Our Recruitment Journey

- KKNA has hired over **100 new roles** for the past few years through our internal recruitment team almost exclusively
- Our average **time to hire is below (faster than) industry average** at 46 days
- The acceptance rate on offers is at 92% for full-time employment which is **above industry average**
- **Reduced turnover** from above 20% 4 years ago to 10% last year which is below Industry average
- The expansion of our office in Princeton has been very successful in our talent workforce strategy coupled with our hybrid work policy

Being a Japanese expat and living in New Jersey

Rieko Waxman

Corporate Planning Head

Kyowa Kirin, Inc.



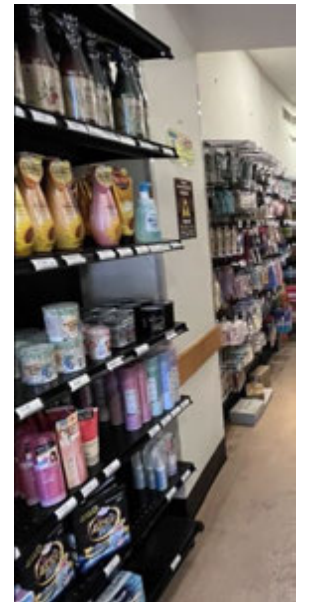
駐在が決まった時の気持ち

- アメリカ（プリンストン）で生活することに対する不安
 - 安全性
 - 気候
 - 子供の教育－現地の学校（就学前、公立学校）、日本語学校
 - 食事

- アメリカでの生活に対する期待
 - 日本ではできない経験

プリンストンでの2年半の生活

- 安全性
 - 全く問題なし。シカにだけ気を付けて。
- 気候
 - 冬は思ったよりもマイルド。室内は自動空調のため、日本よりも夏も冬も快適。ただし秋は朝と昼の温度の差は激しい。
- 子供の教育
 - 就学前のチャイルドケアの選択肢の多さ（カーネギーセンター内にも）
 - 全日制の公立キンダー
 - 現地学校での英語サポート、放課後教育
 - 日曜日本語学校と日本人コミュニティ
- 食事
 - 日本スーパーマーケット（雑貨、薬等も取り扱い）
 - 韓国系および中国系のスーパーマーケット
 - カフェ（本格抹茶カフェ、パンケーキ屋、寿司、韓国系ベーカリー等）



Princetonで楽しむ「アメリカならではの」

- 旅行（国内、国外）
 - Princeton Junctionからニューヨークまで1時間強、ワシントンDCまで3時間弱
 - ニューアーク空港まで車で1時間、トレントン空港まで20分
 - ニュージャージーからのクルーズ乗船
- 住環境
 - アメニティの充実したアパートメント
 - 3階建てガレージ付きのタウンハウス
 - コミュニティのイベント（ハロウィーン、クリスマス等）
- その他
 - サマーキャンプ
 - ダイバーシティ
 - プリンストン大学（カレッジスポーツ、イベント、クラスの聴講）



Thank You.



Carnegie Center



With significant presence in six markets and their surrounding sub-markets: Boston, New York, Los Angeles, San Francisco, Seattle and Washington, DC, BXP is the largest publicly traded developer, owner, and manager of premier workplaces in the United States. BXP's mission is to envision, develop, and manage exceptional properties that enhance client success, strengthen communities, and advance opportunity. We create environments for forward-thinking companies to shape corporate culture, energize their workforce, and accelerate their growth.



Carnegie Center.
An inspiring and exceptional, creative
environment to work and collaborate.



Strategically located at the exceptional focal point of the Route One Corridor in Princeton, mid-way between Philadelphia and New York City.



Princeton

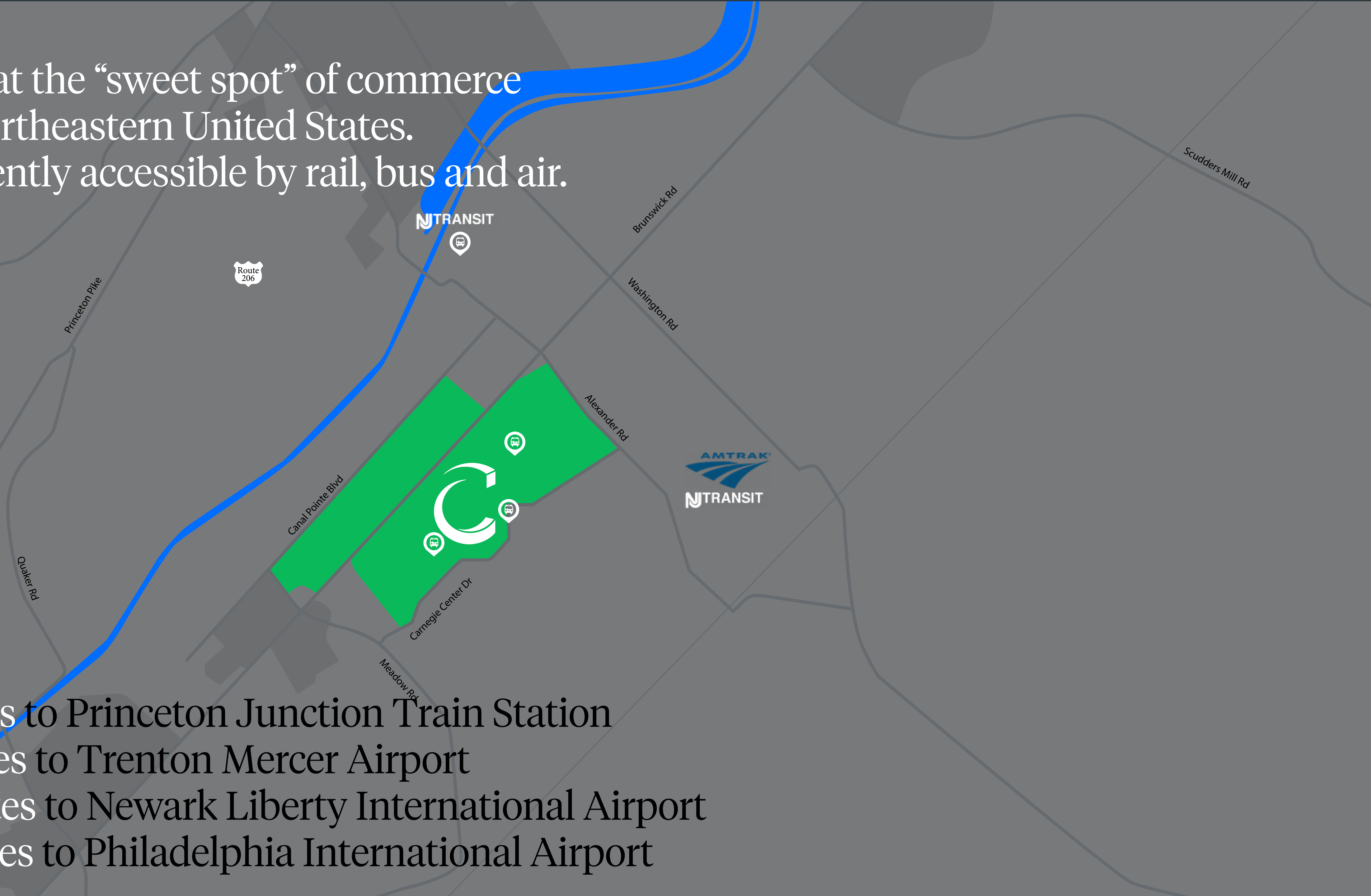
Money Magazine's top 15 towns
to live in America

A quality of life that is second to none

McCarter Theater
Photo by Matt Pilsner



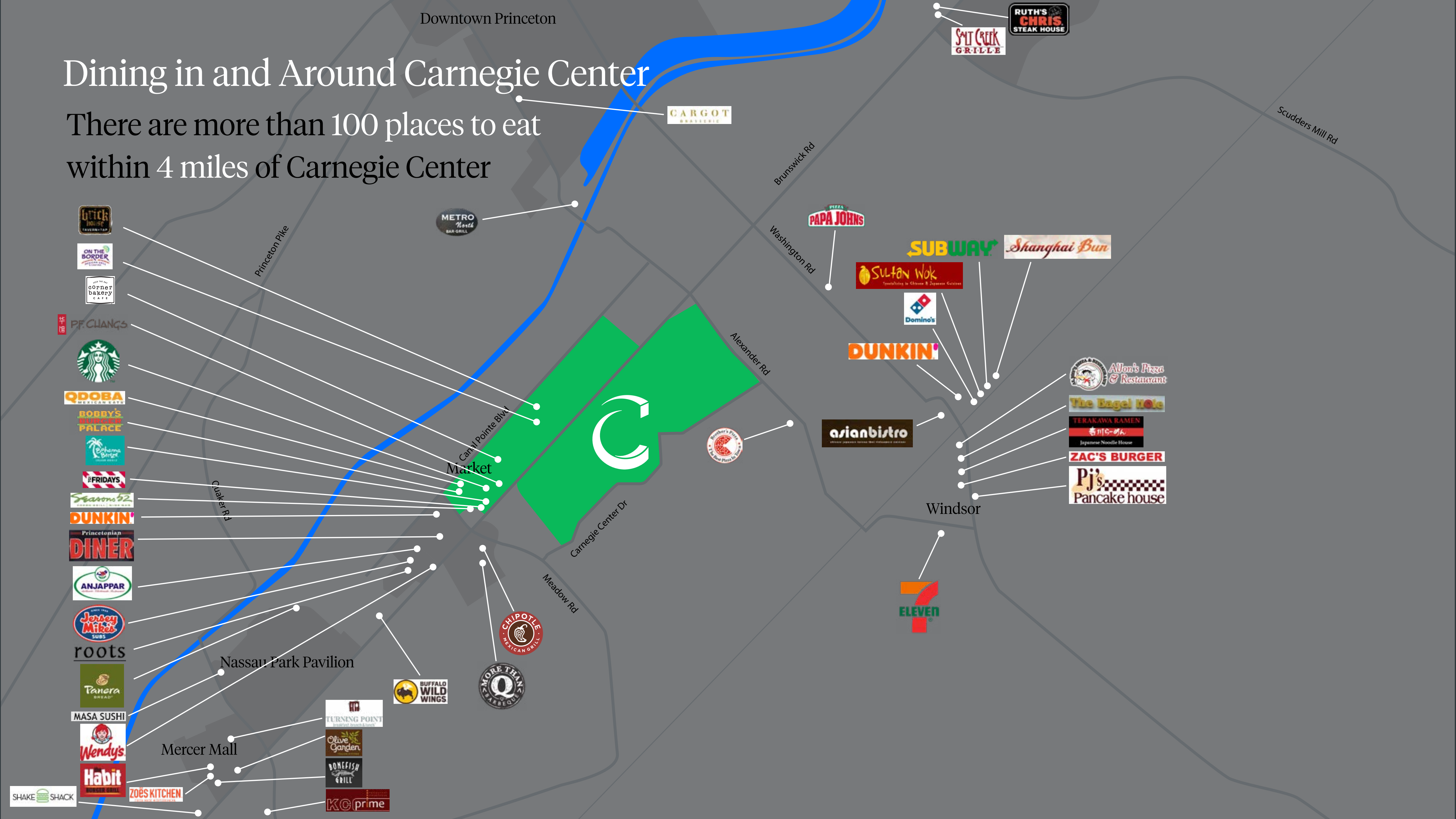
Located at the “sweet spot” of commerce
in the Northeastern United States.
Conveniently accessible by rail, bus and air.



4 minutes to Princeton Junction Train Station
15 minutes to Trenton Mercer Airport
49 minutes to Newark Liberty International Airport
59 minutes to Philadelphia International Airport

Dining in and Around Carnegie Center

There are more than 100 places to eat within 4 miles of Carnegie Center



Route 206

Downtown Princeton

Everything You Need is Nearby



















Wegmans

Michaels

























Mercer Mall

QUAKER BRIDGE MALL

Nassau Park Pavilion

Market

Canal Pointe Blvd

Carnegie Center Dr

Meadow Rd

















Brunswick Rd

Washington Rd

Alexander Rd















Windsor

Scudders Mill Rd

Hotels

Hospitality that's uniquely Princeton



Talent and Academic Resources

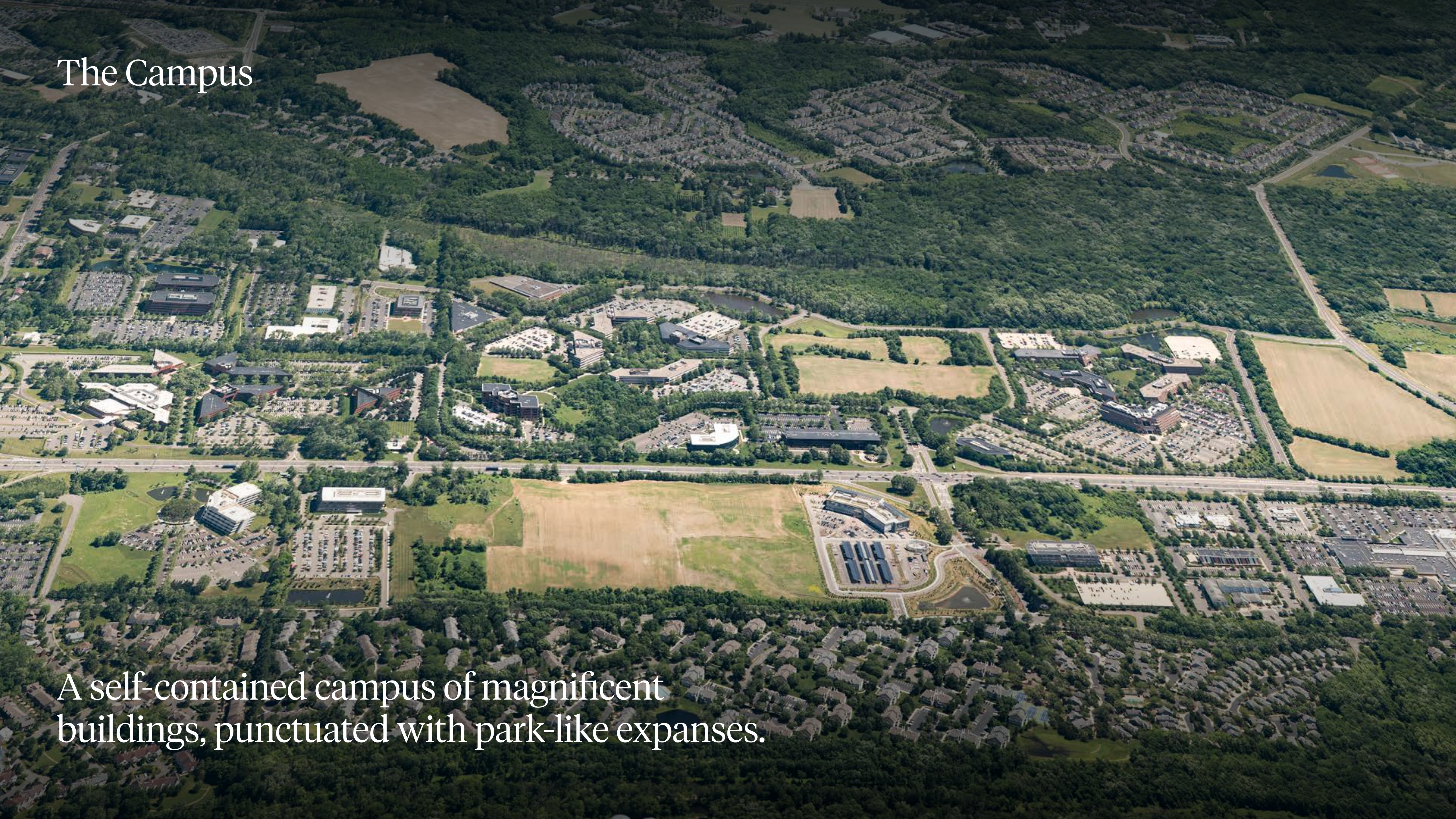
Acclaimed and leading universities
within an hour of Carnegie Center



Arguably, the best-trained workforce in the nation.

The Campus

A self-contained campus of magnificent buildings, punctuated with park-like expanses.



The Campus



The Campus



On Site Cafés



On Site Cafés



On Site Cafés



On Site Cafés



Fitness Center



Fitness Studios/Classes



Walking Paths



Bike Share



Basketball/Volleyball



Bocce



Conference Centers



Childcare



Helipad

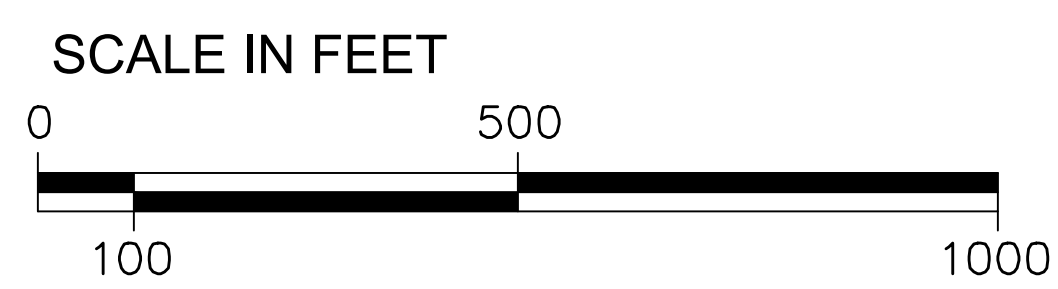


Solar



Electric Charging





LEGEND	
	COMPLETED BUILDINGS
	FUTURE BXP BUILDINGS



T&M ASSOCIATES
CONSULTING ENGINEERS





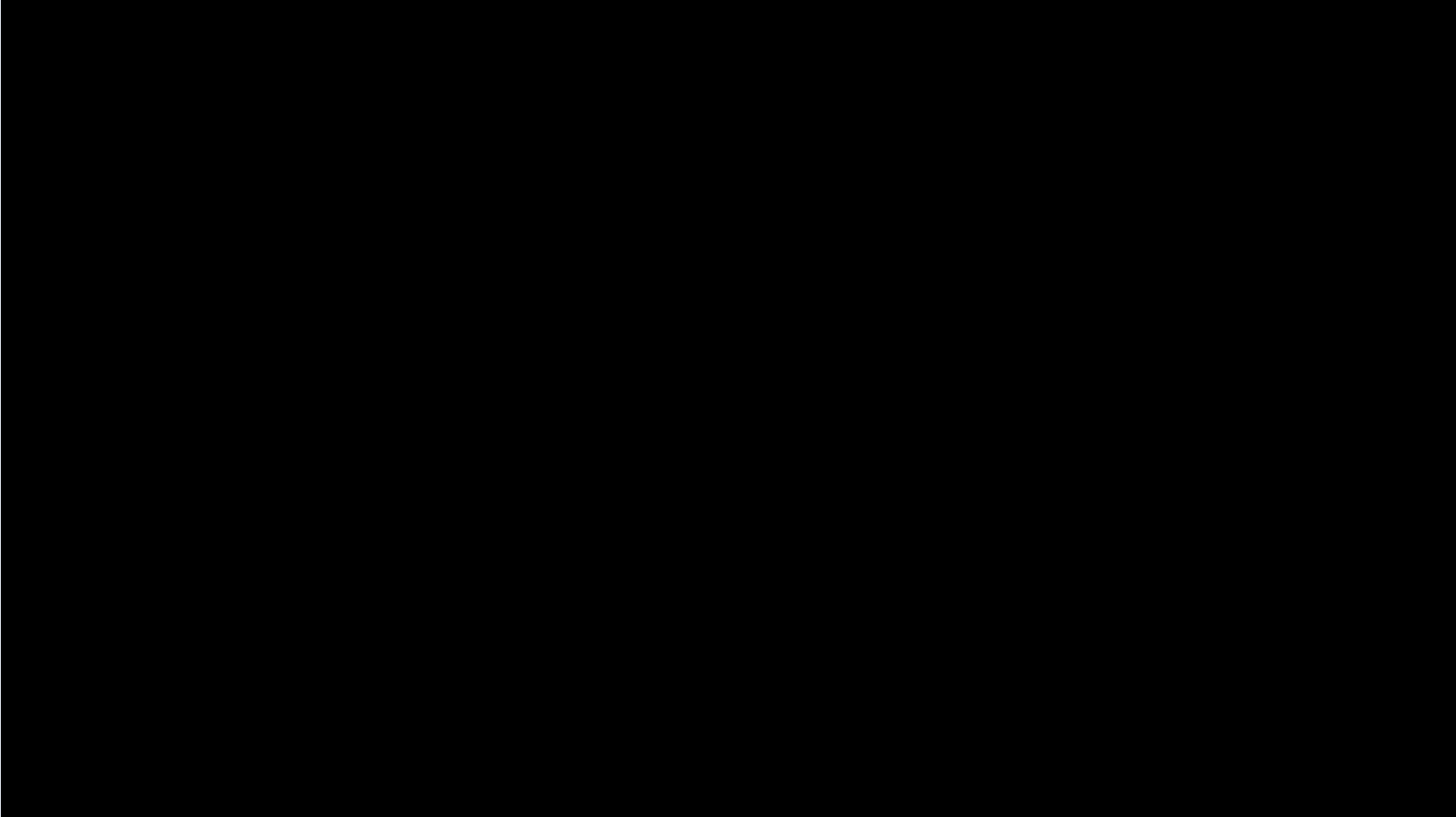
Kyowa Kirin	22K SF in 2001 – 80K SF Current
Taiho Oncology	13K SF in 2006 – 82K SF Current
Otsuka Pharmaceutical	22K SF in 2012 – 134K SF Current
Akros	15K SF in 2000 – 23K SF Current
Tsumura & Co.	1K SF in 2015 – 2,500 SF Current





CELLARES

The Integrated Development and Manufacturing
Organization: The Future of Cell Therapy
Manufacturing



Cellares is the World's first **Integrated Development & Manufacturing Organization (IDMO)**



Cellares can produce **10x** more cell therapy doses with the same facility size and the same headcount than conventional CDMOs

Vertical Integration

Advanced Technologies + Global Manufacturing Services



Cell Shuttle™

Compact automation enables concurrent processing of up to 16 batches and 90% reduction in labor and facility size



Cartridge

Closing and automating the process reduces process failure rates by 75% compared with open and manual methods



Software

Powerful and flexible software supports 90% of allogeneic and autologous cell therapy modalities

ADVANCED TECHNOLOGIES



MANUFACTURING SERVICES



South San Francisco (CA) Preclinical & Clinical Services / Technology Development

- 57,000 ft²
- cGMP-ready in H1/2024
- 2 Cell Shuttles (capacity)
- 1,600 patient doses per year (based on a 7 day process)



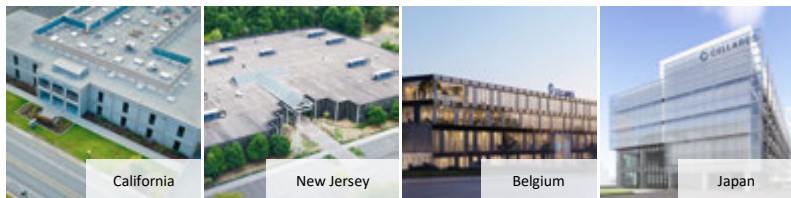
Bridgewater (NJ) Preclinical, Clinical & Commercial Services

- 118,000 ft²
- cGMP-ready in H2/2024
- 50 Cell Shuttles (capacity)
- 40,000 patient doses per year (based on a 7 day process)

The Cellares IDMO

Global Manufacturing Services Delivered via Integrated Technologies

Global Network of Smart Factories



- 10 Times as Many Cell Therapy Batches as Conventional CDMOs with the Same Facility Footprint and Headcount
- Automation and Integration Result in Up to 50% Reduction in Batch Prices Compared to Conventional CDMOs
- Rapidly Expand Into New Global Markets via Software-Driven Tech Transfer



Fully Integrated & Automated Technology



Cell Shuttle™ (Manufacturing)

Closes, Automates and Parallelizes All Cell Therapy Manufacturing Unit Operations



Cell Q™ (QC)

Fully Automates Cell Therapy Quality Control with the Ability to Automate In-Process & Batch Release QC



IDMO Software Suite (Integration)

Fully Integrated Software Stack Provides Closed-Loop Manufacturing and Full Traceability Vein-to-Vein

Cellares Invented Integrated Technologies For Automated, High Throughput CT Manufacturing and QC



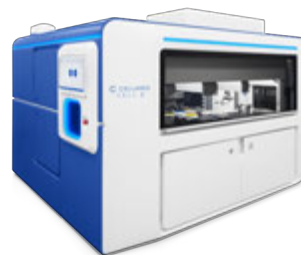
THE CELL SHUTTLE AUTOMATES MANUFACTURING



- 16 batches processed in parallel
- Majority of modalities supported



THE CELL Q AUTOMATES QC



- Throughput = 6,000 batches / year
- Reduced assay turnaround time

Cellares can produce 10x more cell therapy doses with the same facility size and the same headcount than conventional CDMOs



90% less labor required



90% less facility space required



Reduced process failures



Cell Shuttle: Integrated Automated cGMP Manufacturing



CELLARES CELL SHUTTLE

Integrated cGMP Cell Therapy Manufacturing

The Cell Shuttle has achieved clinically relevant in-process & release specifications and cell doses as compared to commercial drug products

CD3+ T Cell Purity

✓ >99%

Cell Viability

✓ >95%

Transduction Frequency

✓ >65%

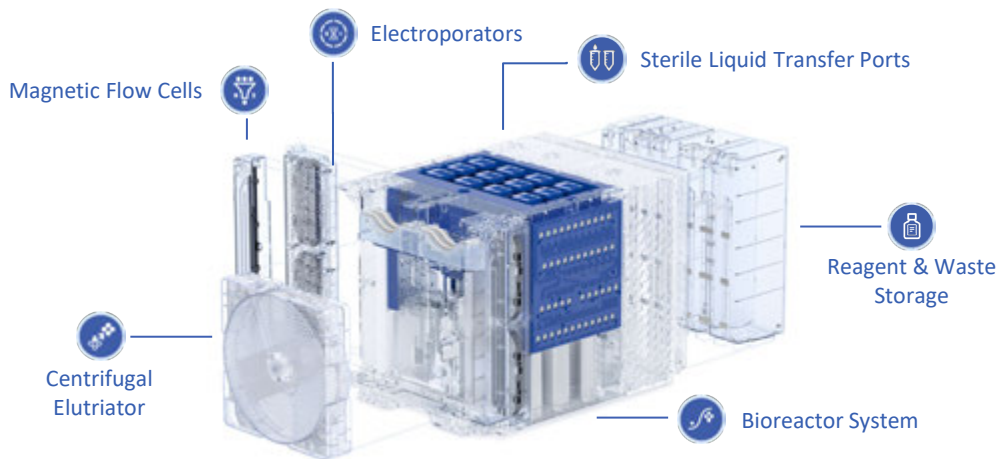
[Brochure: End-to-End Cell Therapy Manufacturing on the Cellares Cell Shuttle Platform](#)

True Walk-Away End-to-End Manufacturing Automation from Loading the Starting Material to a Cell Therapy Drug Product



Single-Use Consumables Provide a **Closed & Automated End-to-End Solution**

cGMP Factory-in-a-box



Cellares Single-Use Cartridge Integrates All Unit Operations

- **Automation** eliminates opportunities for **operator error**.
- **Closing the process** eliminates opportunities for **contamination**.

Automated reagent bottles

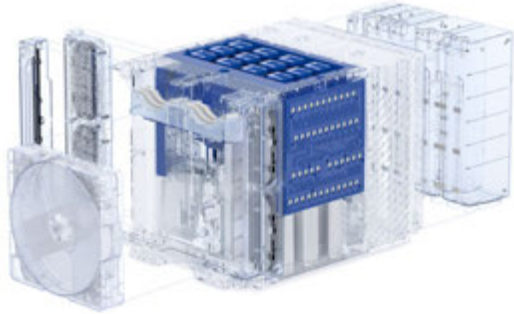


Cellares Single-Use Reagents & Samples

- Reagent additions
- Sampling
- Waste removal

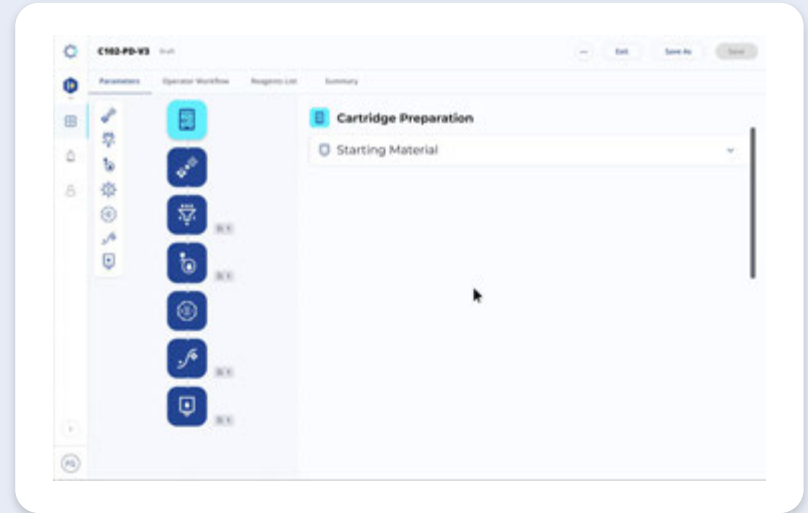
Software-Defined Manufacturing Enables Mass Customization

Software unlocks the full versatility of the hardware



- ✓ All processes use the same cartridge
- ✓ Majority of cell therapy modalities supported

Modular fluidic architecture enables flexibility to customize unit operations for different processes



Manufacturing processes in the cartridge are defined in software

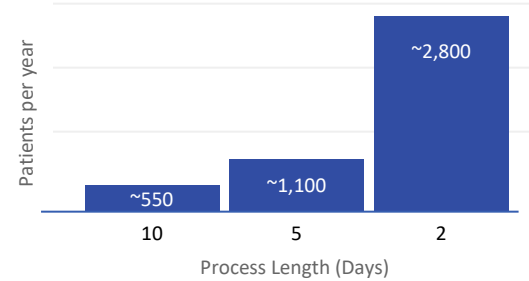
Enabling Commercial Scale Manufacturing of Cell Therapies



+



=



INTEGRATED AUTOMATION

All unit operations automated and enclosed in one Consumable Cartridge

HIGH-THROUGHPUT

Up to 16 cartridges for multi-product, concurrent manufacturing

SCALABILITY

Up to 2,800 batches per Cell Shuttle per year



Cell Q: Automated QC



CELLARES

CELL Q

Integrated cGMP Cell Therapy QC

- Integrates and Automates Best-in-Class Industry-Standard QC Instrumentation
- Modular Design Provides Automates QC Assays and can incorporate future Assays
- A single Cell Q Supports the throughput of a Fleet of Cell Shuttles
- Automation Reduces the QC Labor Required and Assay Turnaround Time

Commercial-Scale Cell Therapy Manufacturing Requires the Automation of Release Testing (QC)



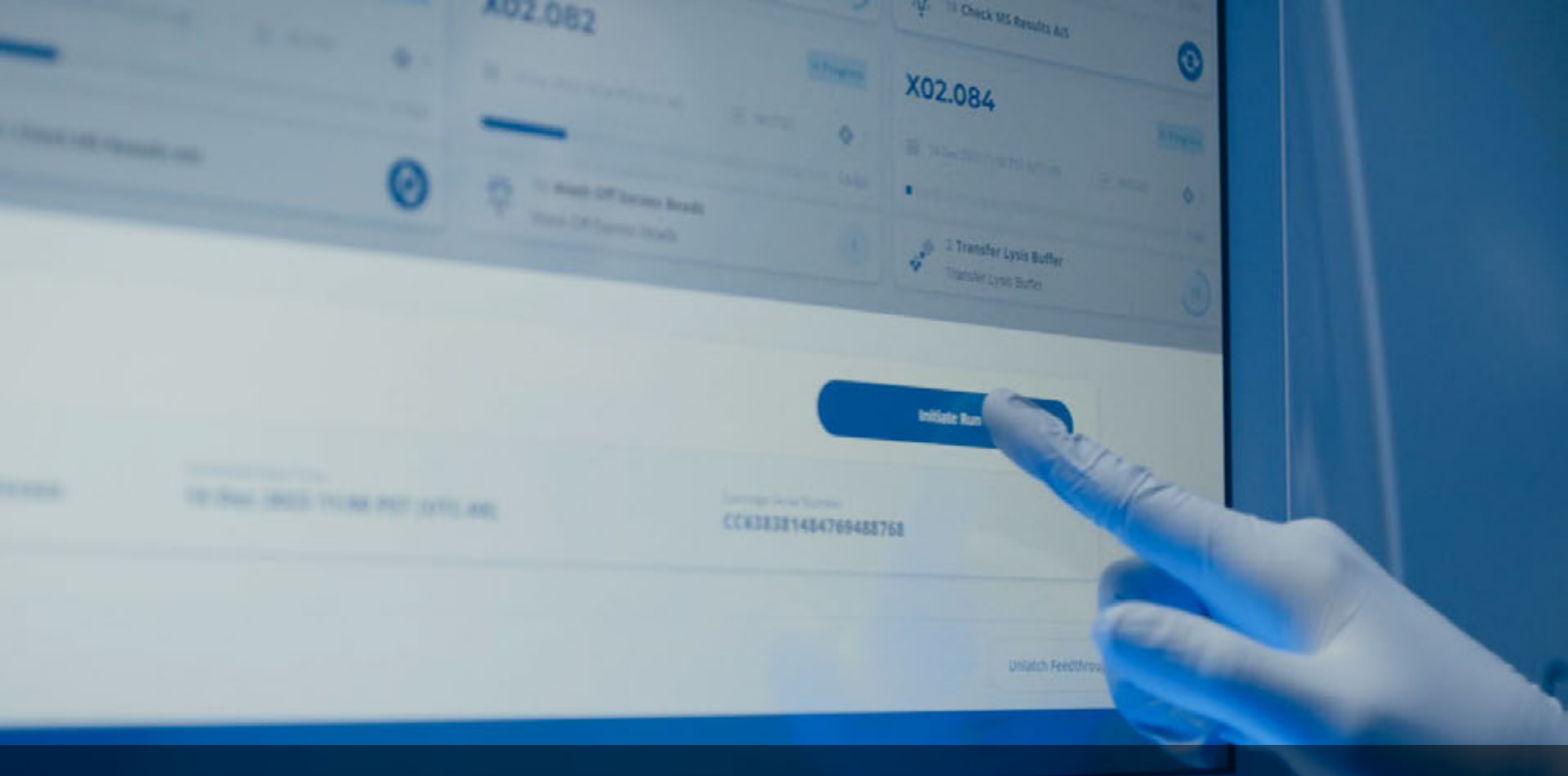
Software Integration

Modular Cart System

Integrated Liquid Handler

- Automates majority of in-process and release QC assays
- 6,000 batches tested / yr
- Integrates & automates best-in-class, off-the-shelf QC instrumentation
- Technology enables Cellares IDMO to offer up to 50% lower batch price compared with conventional CDMO

The image shows a large blue and white Cell Q instrument. Three circular callouts highlight specific features: 'Software Integration' points to the top control panel, 'Modular Cart System' points to a smaller unit on a cart to the left, and 'Integrated Liquid Handler' points to the internal sample handling mechanism.

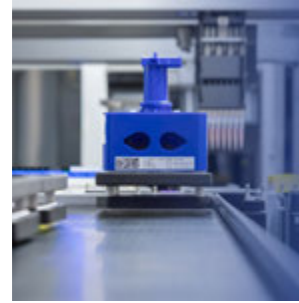
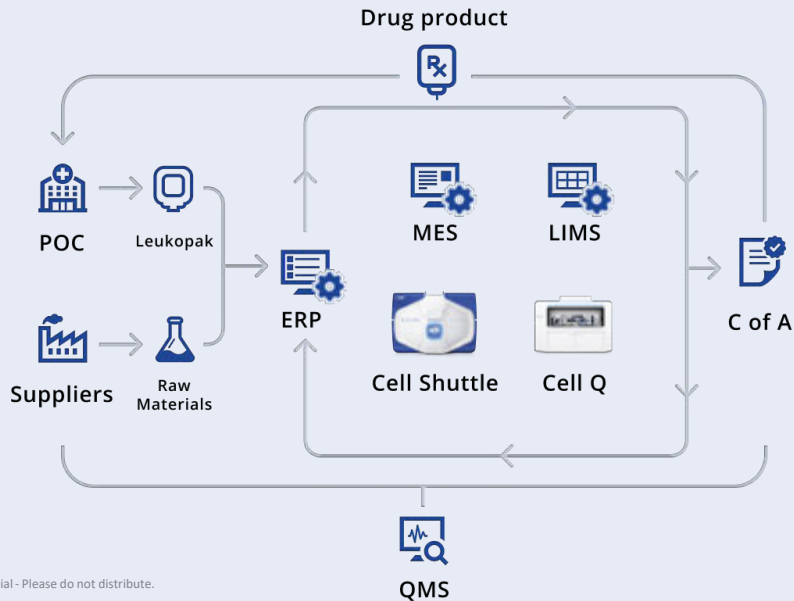


Integrated Software Driven Automated Manufacturing

Integrated Software Stack



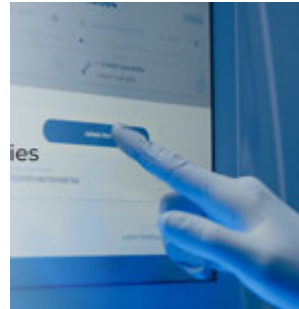
Complete Traceability = Closed Loop Vein-to-Vein



Automated Barcoding of Starting Materials and Reagents



Strict CoC & CoI



Software-Defined Manufacturing



Digitized Manufacturing Process



Flexibility + Rapid Tech Transfers

Cellares Overcomes the Limitations of Conventional CDMOs through the **IDMO Advantage**



Scale



Cost Savings



Speed

NJ Life Science Overview

November 2024



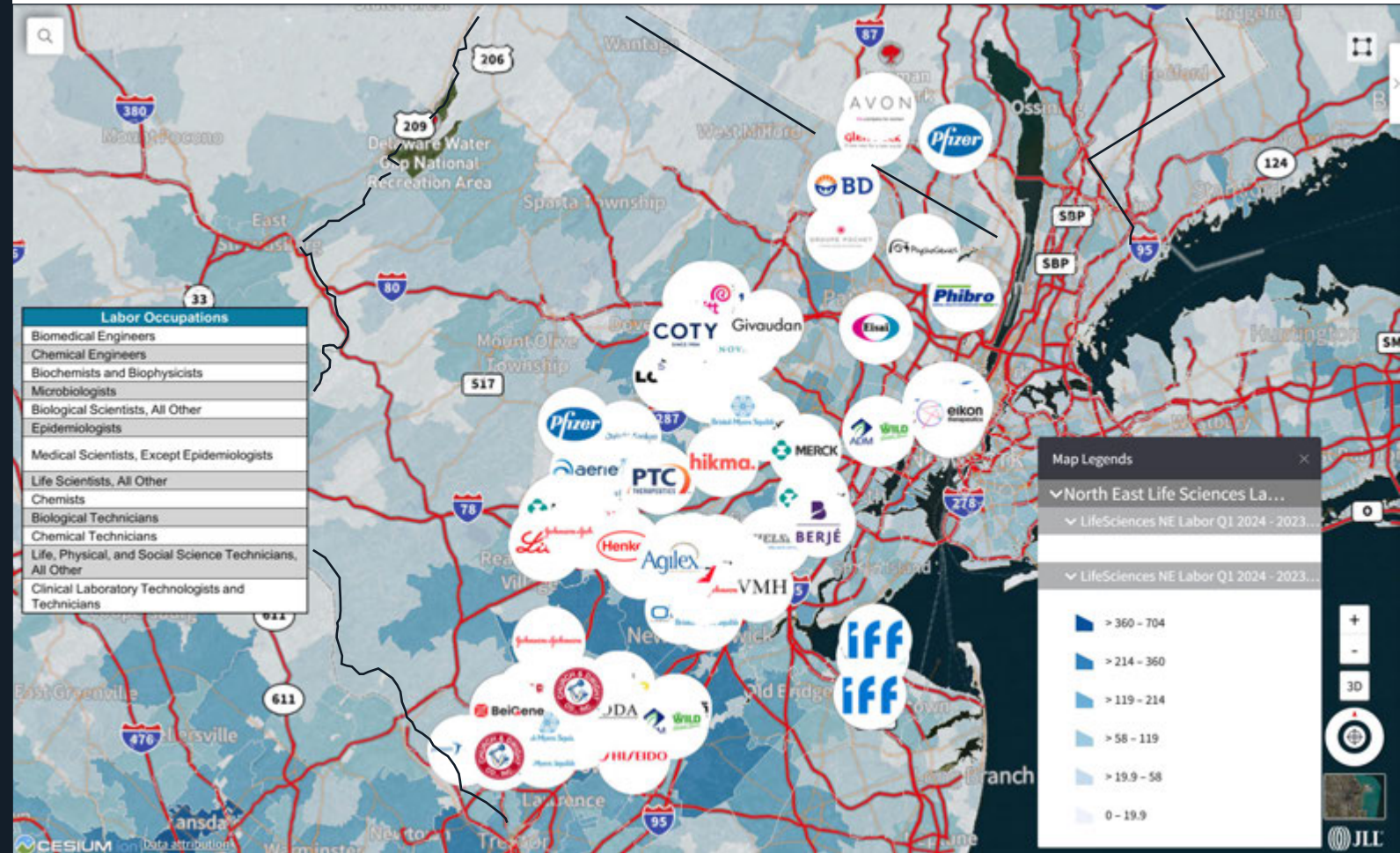
Talent concentration



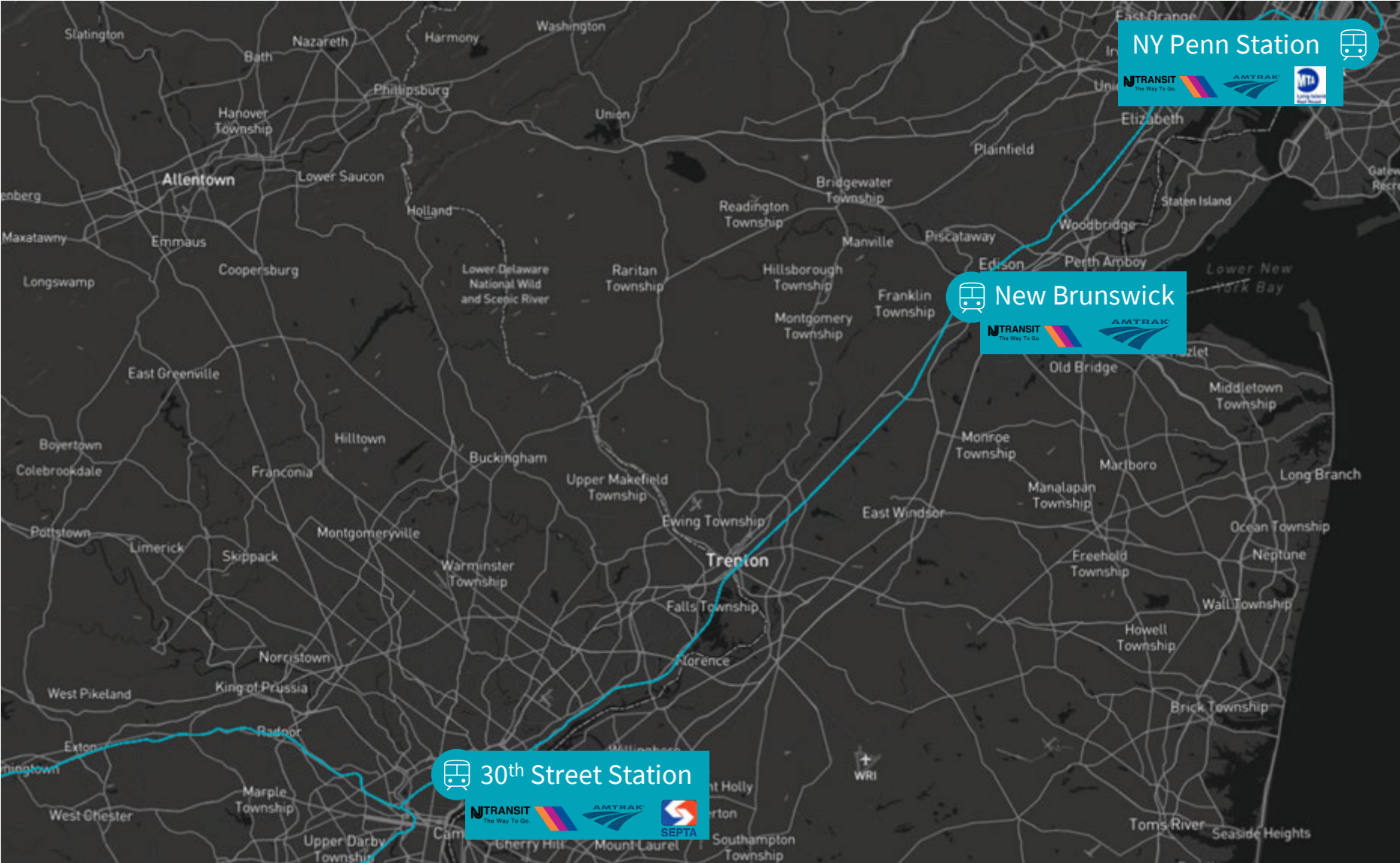
Talent concentration with NJ based LS and Consumer Product companies

Life science & consumer product companies

- Beckton Dickinson
- Glenmark
- Psycho Genesis
- Eisai
- Cambrex
- Modern Meadow
- Teva
- Ferring Pharmaceuticals
- DSM
- Pacira
- Zoetis
- Gilead
- Alovgen
- Bayer
- Shinogi
- Cellularity
- Pfizer
- Abbvie
- Merck
- Leo Pharma
- Lonza
- Hikma
- Bristol Myers Squibb
- Helsinn
- Actavis
- Mitsubishi Tanabe Pharma
- Organon
- Biolabs NYU Langone
- Mispro
- Lilly
- Pfizer
- Kadmon
- NYU Langone Health
- Amneal
- Pfizer
- Daiichi-Sankyo
- Ipsen
- Aurobindo
- GSK
- Sanofi
- Ethicon
- Amarin Corporation
- Jansen
- Johnson & Johnson
- Ortho Clinical Diagnostics
- Roche
- Lilly
- Advaxis
- Sandoz
- Firmenich
- Novo Nordisk
- WuXi
- Bioclinica
- Otsuka
- Akros Pharma
- Aurobindo
- BMS
- Prevail
- Collectis
- Alexandria Launch Labs
- Astra Zeneca
- Mallinckrodt
- Janssen

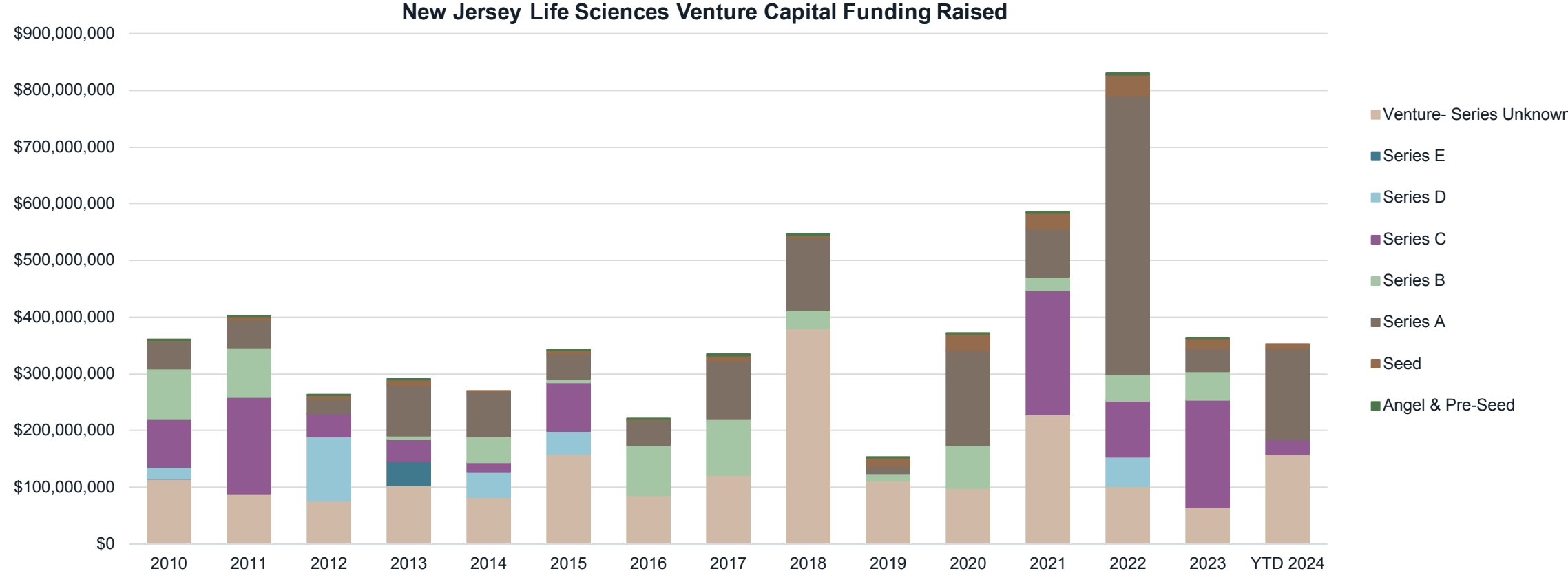


Northeast Corridor Rail Line



Lab demand driver #1: Funding

More than \$353 million of VC funding poured into New Jersey's life sciences industry during 1H 2024, with nearly 50% of capital raised in the Series A stage

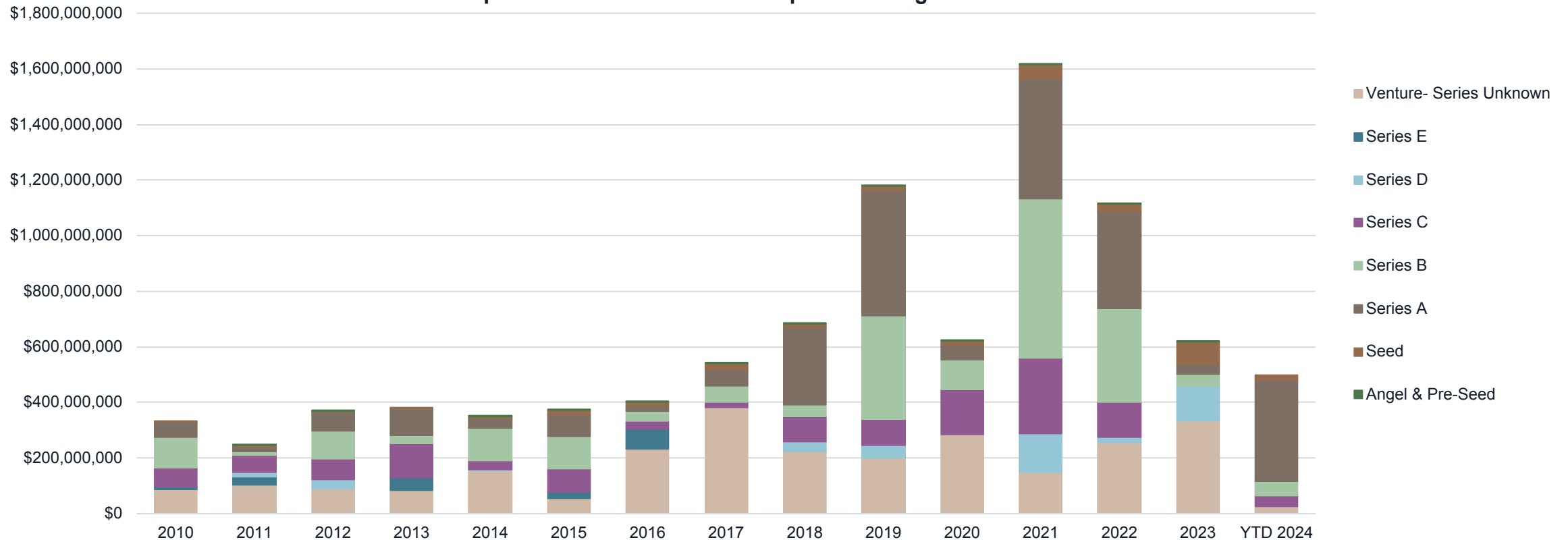


Source: Crunchbase

Lab demand driver #1: Funding

Nearly \$500 million of VC funding was invested in Philadelphia's life sciences industry during 1H 2024, with nearly 3/4 of capital raised in the Series A stage

Philadelphia Life Sciences Venture Capital Funding Raised

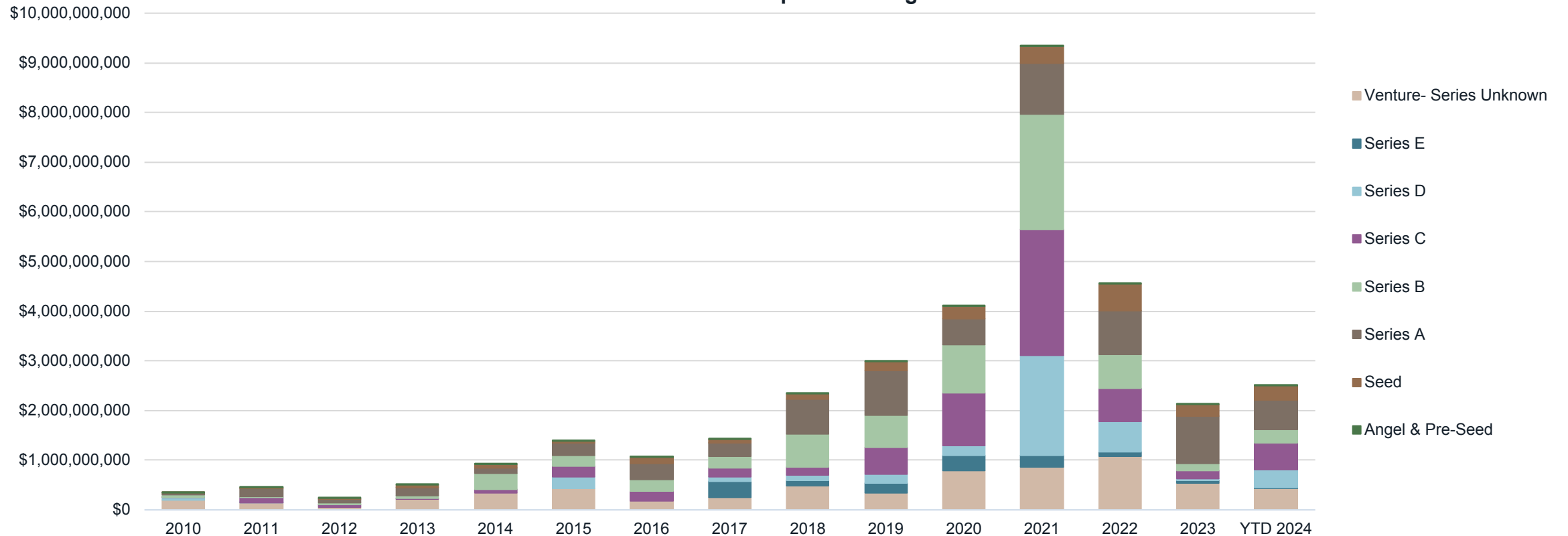


Source: Crunchbase

Lab demand driver #1: Funding

More than \$2.5 billion of VC funding poured into the NYC's sciences industry during 1H 2024, which rivaled the \$2.1 billion in funding raised during all of 2023

NYC Life Sciences Venture Capital Funding Raised



Source: Crunchbase

New Jersey clinical trial production boom

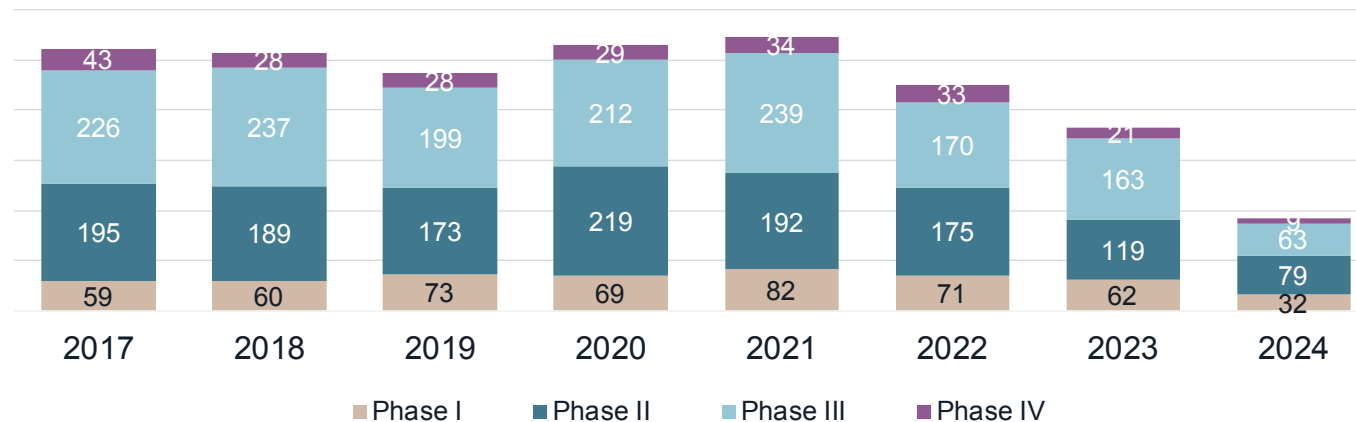


Drug pipeline points to a wave of demand for clinical trial production progressing from Phase III to FDA drug review

Stage	Drugs in pipeline: NJ	% of U.S. pipeline	Overall success	Projected successful drugs to market
Phase 1	62	7%	13.8%	9
Phase 2	119	9%	21.0%	25
Phase 3	163	29%	59.0%	96
Total	344	12%	13.8%	47

- New Jersey is responsible for 12% of drugs in the U.S. pipeline.
- Nearly 50% of therapies in the Garden State's drug development pipeline were in the Phase III stage at year-end 2023.
- Artificial intelligence (AI) methods are now critical in the R&D process and throughout the drug development pipeline. Implementation of AI technology can accelerate productivity in drug discovery, clinical trials, testing of existing drugs for new uses and aggregation of data at scale.
- Established biopharma companies are increasingly investing in AI-focused start-ups, and this field will continue to be a primary driver of the life sciences innovation engine.

Drug development pipeline - NJ



Source: Global Data; MIT

Philadelphia clinical trial production boom

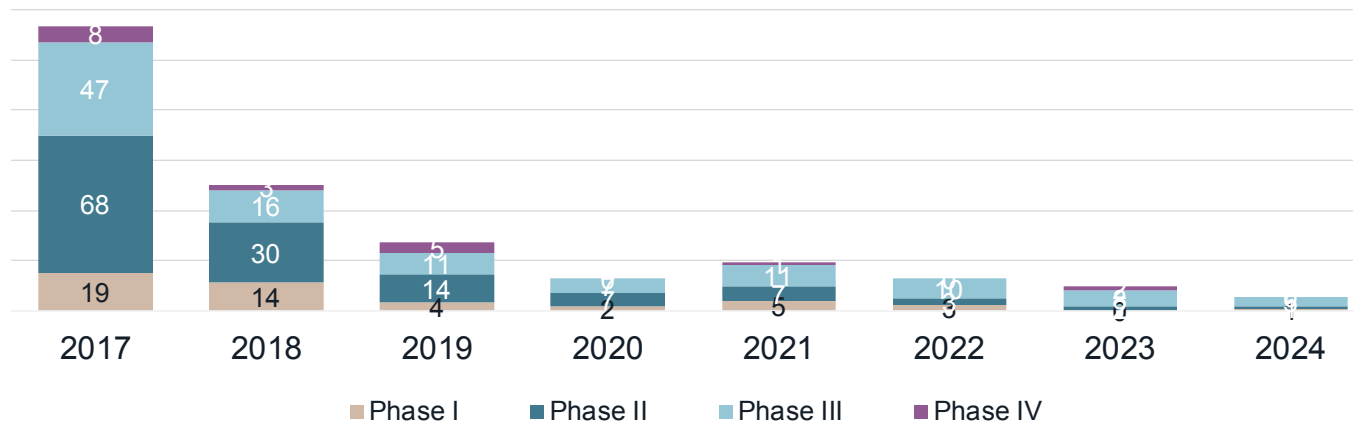


Drug pipeline points to a wave of demand for clinical trial production progressing from Phase III to FDA drug review

Stage	Drugs in pipeline: Phila.	% of U.S. pipeline	Overall success	Projected successful drugs to market
Phase 1	0	0%	13.8%	0
Phase 2	2	0%	21.0%	0
Phase 3	8	1%	59.0%	5
Total	10	0%	13.8%	1

- Approximately 80% of therapies in the Philadelphia drug development pipeline were in the Phase III stage at year-end 2023.
- Artificial intelligence (AI) methods are now critical in the R&D process and throughout the drug development pipeline. Implementation of AI technology can accelerate productivity in drug discovery, clinical trials, testing of existing drugs for new uses and aggregation of data at scale.
- Established biopharma companies are increasingly investing in AI-focused start-ups, and this field will continue to be a primary driver of the life sciences innovation engine.

Drug development pipeline - Philadelphia



Source: Global Data, MIT

NYC clinical trial production boom

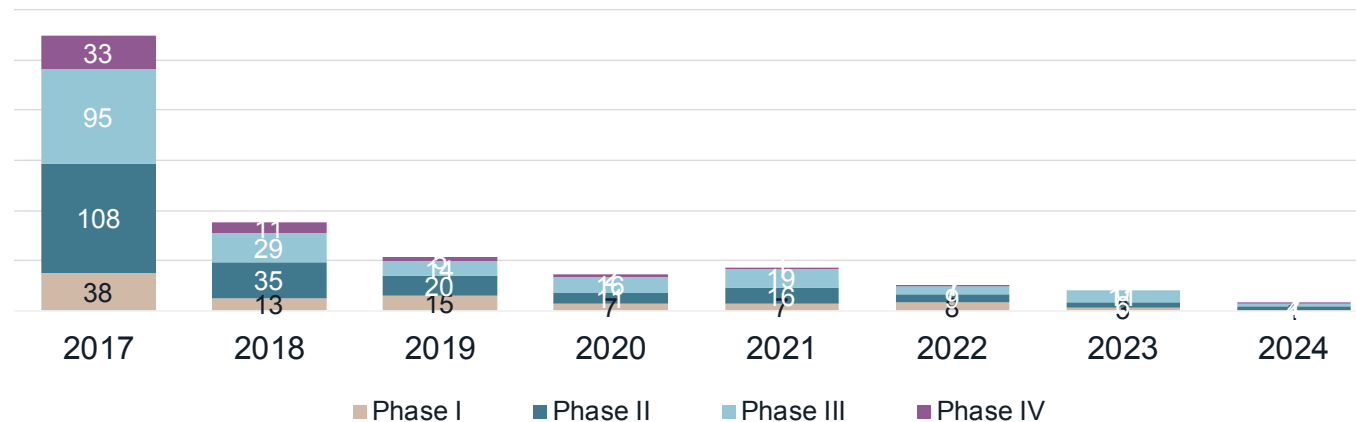


Drug pipeline points to a wave of demand for clinical trial production progressing from Phase III to FDA drug review

Stage	Drugs in pipeline: NYC	% of U.S. pipeline	Overall success	Projected successful drugs to market
Phase 1	3	0%	13.8%	1
Phase 2	6	0%	21.0%	1
Phase 3	11	2%	59.0%	7
Total	20	1%	13.8%	3

- Approximately 55% of therapies in the NYC drug development pipeline were in the Phase III stage at year-end 2023.
- Artificial intelligence (AI) methods are now critical in the R&D process and throughout the drug development pipeline. Implementation of AI technology can accelerate productivity in drug discovery, clinical trials, testing of existing drugs for new uses and aggregation of data at scale.
- Established biopharma companies are increasingly investing in AI-focused start-ups, and this field will continue to be a primary driver of the life sciences innovation engine.

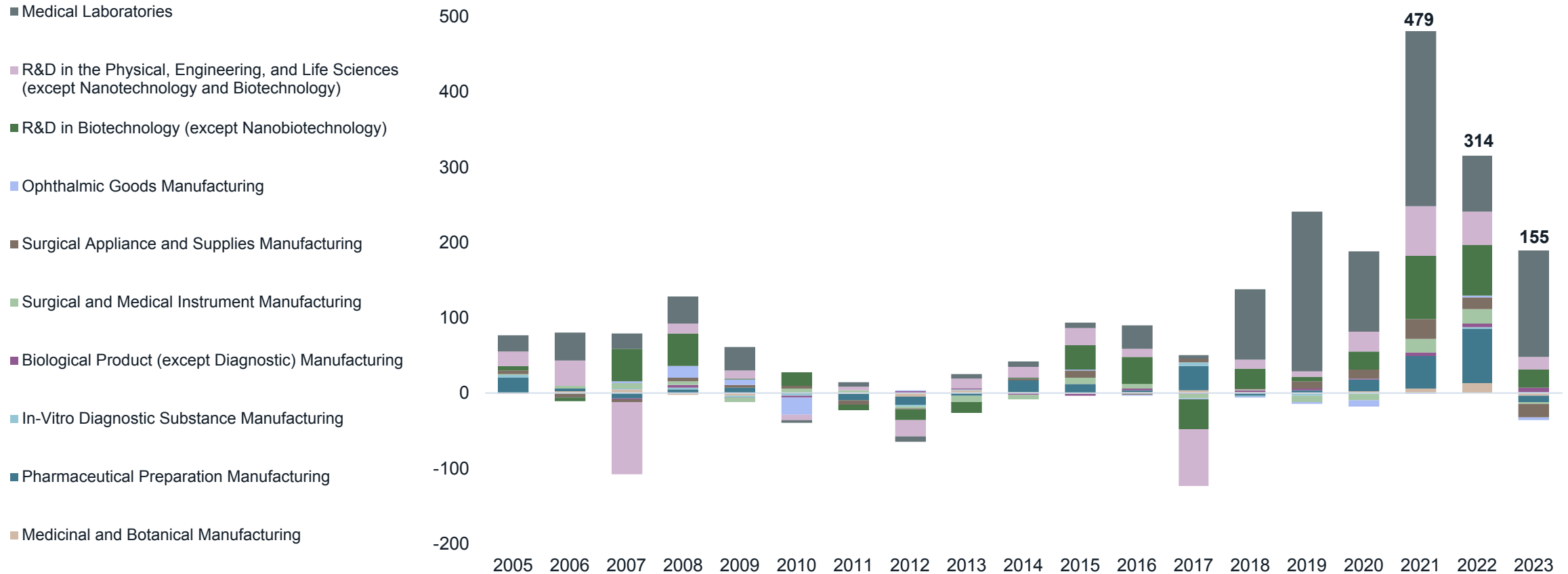
Drug development pipeline - NYC



Source: Global Data, MIT

New Jersey company formation timeline suggests sustained local manufacturing demand

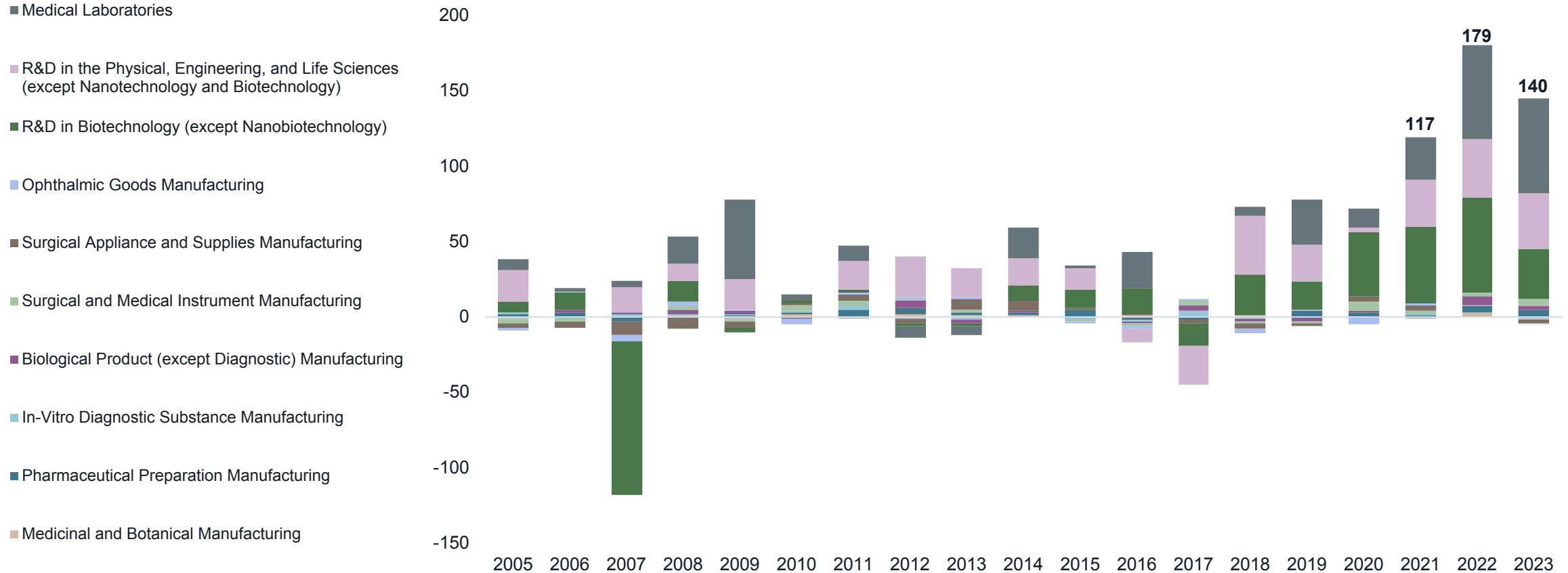
Life Sciences Company Formation in New Jersey



Source: Lightcast

Philadelphia company formation timeline suggests sustained local manufacturing demand

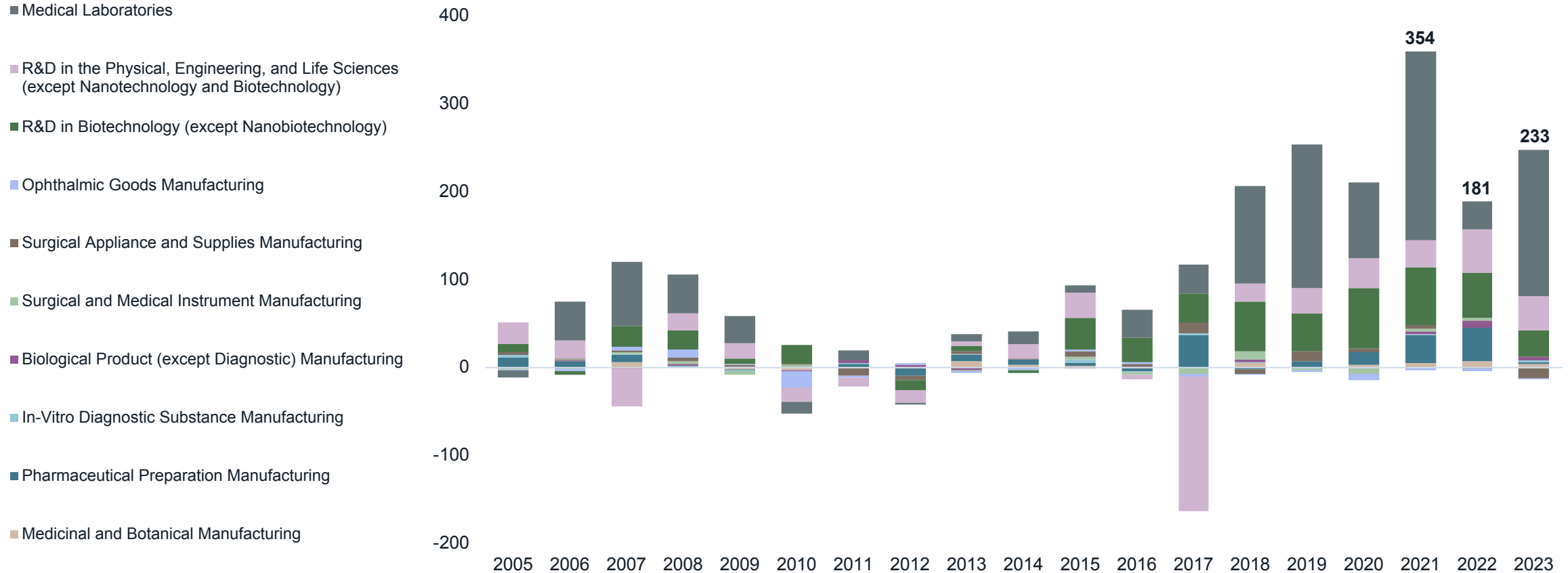
Life Sciences Company Formation in Philadelphia



Source: Lightcast

NYC company formation timeline suggests sustained local manufacturing demand

Life Sciences Company Formation in NYC

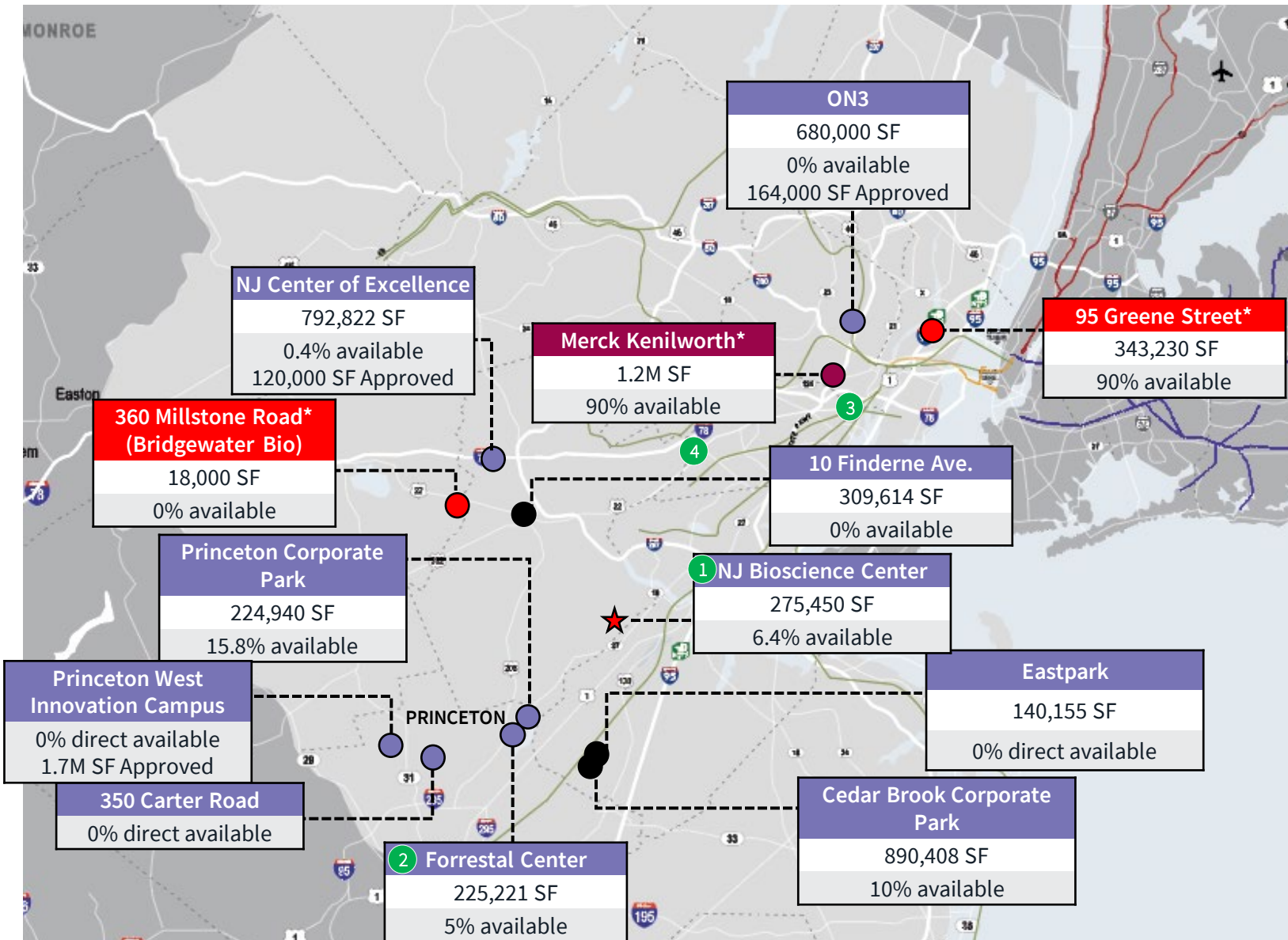


Source: Lightcast

Section 2

Cluster map and stats

Incubators, multi-tenant R&D campuses & manufacturing clusters



% Available is for laboratory space / excludes office or flex available

Multi-tenant R&D campuses

Lab ready buildings

Coming to market

	Market Size (SF)	Direct Available SF	Direct Vacancy Rate
Central NJ	6,666,425	830,394	12.5%
Northern NJ	1,894,125	450,368	23.8%
Leased inventory			
Note - 139 FDA licensed Biopharma MFG facilities, most in US (Primarily owned)			

EXISTING INCUBATORS		
No.	Address	Availability/Notes
1	NJ Bioscience Center 685 Route 1, North Brunswick	<ul style="list-style-type: none"> Small incubator availabilities only Accelerator is fully leased
2	Princeton BioLabs 303 College Road East, Princeton	<ul style="list-style-type: none"> Open office & general lab availabilities only
3	Institute of Life Science & Entrepreneurship 1085 Morris Avenue, Union	<ul style="list-style-type: none"> 15,000 SF fully occupied
4	Incubation & Collaboration Center Off of Route 78, Summit	<ul style="list-style-type: none"> 16,000 SF office and lab facility within BMS Summit West campus Rigorous application process required Legacy Celgene initiative

Your Next Big Idea Starts Here

Discover the ultimate destination for scientific discovery at NEST. Our existing Class-A research & development facilities feature a turn-key vivarium and multiple customizable development opportunities, offering your organization solutions for today and limitless possibilities for tomorrow.

Section 3

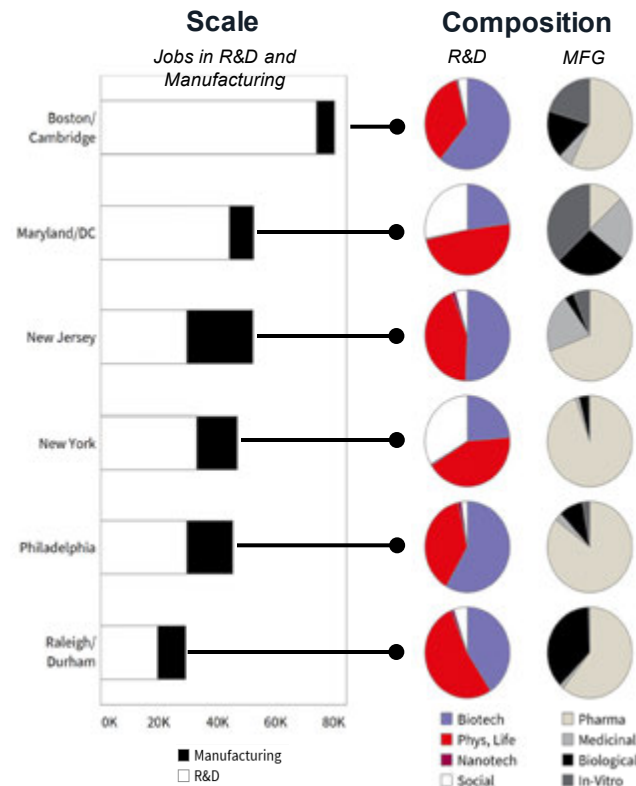
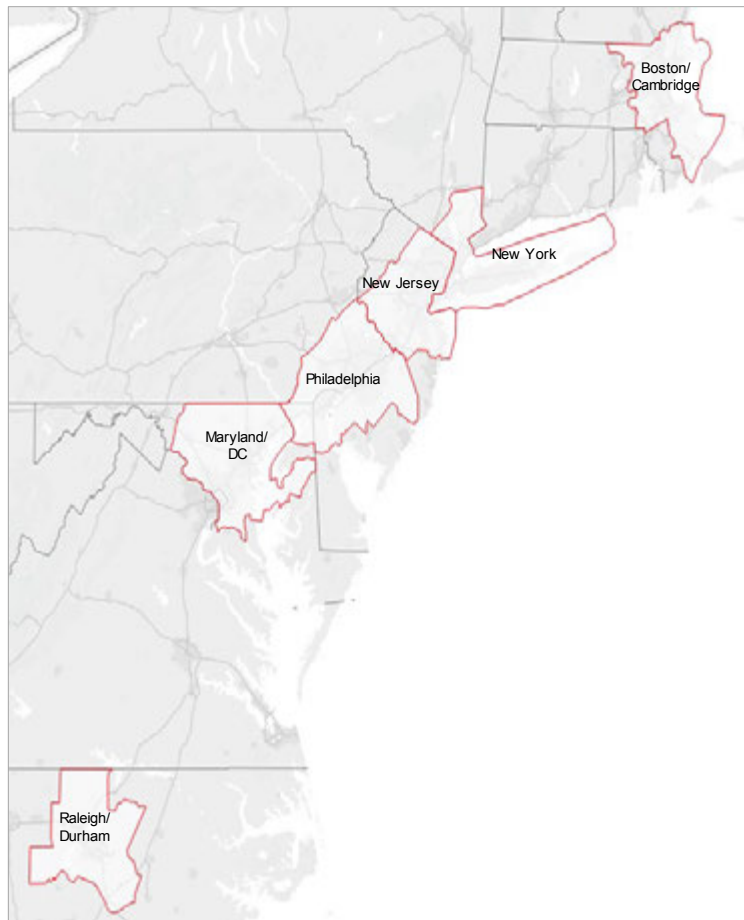
Northeast Life Sciences
Corridor

Northeast life science labor and incentives

R&D and Manufacturing functions

The scale and composition of Research & Development and Life Science related Manufacturing positions across multiple markets show that there is an abundance of talent and a relatively comparable sized labor pool from Maryland north to Manhattan. Boston/Cambridge is leading the way and Raleigh/Durham has experienced tremendous growth in recent years. All markets provide the general talent depth and experience levels to scale which allows for them to be considered and contrasted on other metrics.

Strongest East Coast Life Science Markets



Location	Cost*		Pop. (000s)	
	Average Salary	Index (US=100)	w/ Bachelor's	Graduate+
Boston/Cambridge	\$108,094	114	793	688
Maryland/DC	\$109,399	116	907	849
New Jersey	\$105,824	112	1,087	727
New York	\$108,891	115	1,925	1,460
Philadelphia	\$101,229	107	920	632
Raleigh-Durham	\$98,634	104	385	258

* Includes Bioprocess Engineers, Bioprocess Scientists, Biochemical Engineers, and Bioinformatics Engineers



Rutgers Health :

The health care education,
research, and clinical division at

Rutgers University

Nov 19, 2024

Najwa Borkadi, Ph.D.
Executive Director, Research Business Development



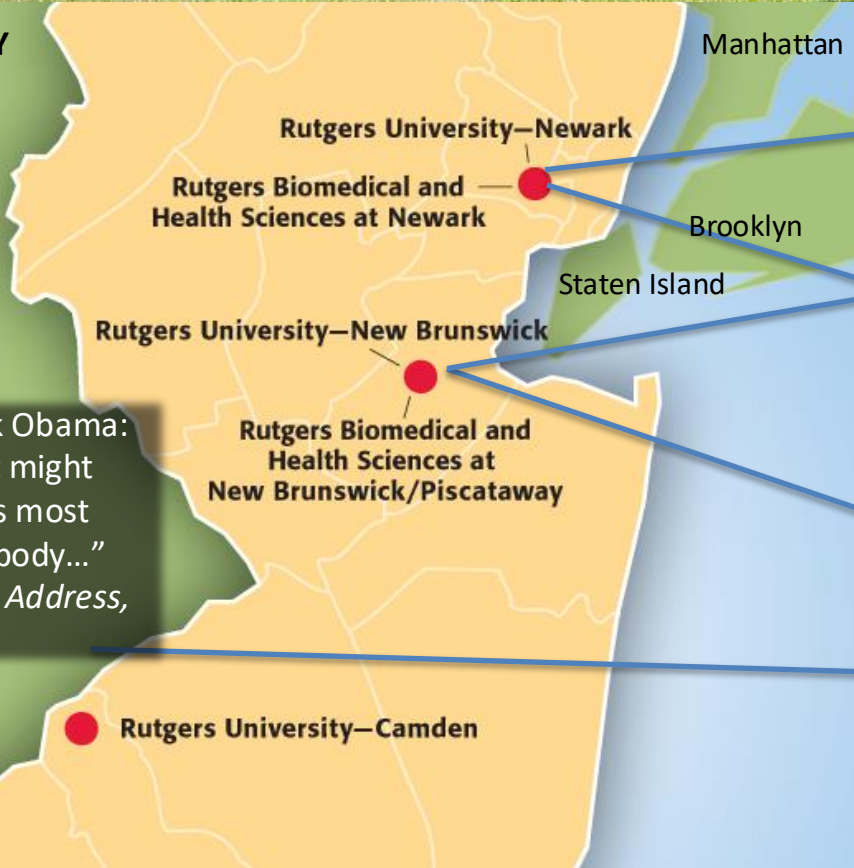
Rutgers Health

Empowering Health for All

Rutgers Health is a nationally-recognized leader in research and innovation, driving groundbreaking discoveries, cutting-edge clinical care, and economic growth. Through basic, clinical, population, and translational research, Rutgers Health researchers are transforming education, improving lives, and advancing knowledge across the life sciences, physical sciences, and social sciences.

Revolutionary

NEW JERSEY



President Barack Obama:
Rutgers “... what might
just be America's most
diverse student body...”
*Commencement Address,
May 2016*

Newark

Arts & Sciences | Business | Law

Newark & New Brunswick

Medical School | Pharmacy | Nursing |
Public Health | Health Professions | Hospital
system

New Brunswick

Art & Sciences | Engineering | Public Policy
| Social Work | Labor Relations | Business
| Graduate Education | Communication &
Information | Environmental & Biological
Sciences

Camden

Arts & Sciences | Business | Law | Nursing

Rutgers By the numbers

A large crowd of Rutgers students in red clothing cheering at a football game. The students are wearing red t-shirts, some with "RUTGERS FOOTBALL" printed on them. Many have their arms raised in the air, and some are shouting or cheering. The background is filled with more students, creating a sense of a large, energetic gathering.

**#1 Public
University**
in New Jersey

**\$969.5
million in FY
2024**

70,000+
students from
50 states and
125 countries

600,000+
Alumni around
the world

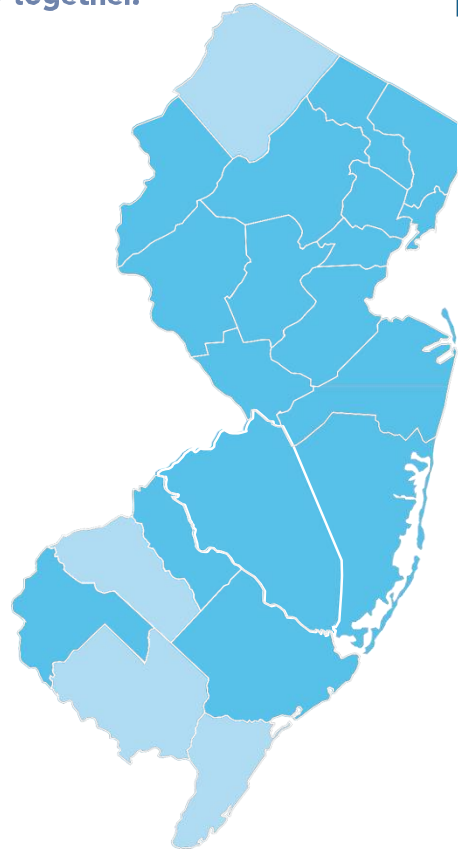
RUTGERS

Let's be healthy together.

RWJBarnabas
HEALTH

**RWJBarnabas Health
and Rutgers locations
offer a vast network of
clinical providers in 17
of New Jersey's 21
counties.***

* Dark areas of the map represent the combined geographic coverage of RWJBarnabas Health and Rutgers which have signed in 2021 Letter of Partnership



RUTGERS HEALTH AT A GLANCE



Top 20 Best Graduate Schools

Rutgers Health is home to top-ranked masters and doctorate of nursing programs, according to U.S. News & World Report.



450+ Clinical Trials

Rutgers Health supports approximately 450 or more clinical trials at any given time, advancing medical research and innovation.



2.3M Annual Patient Visits

Rutgers Health serves millions of patients each year, providing high-quality, patient-centered care across New Jersey.



36 AAAS Faculty Fellow

Rutgers Health is home to 36 faculty members who are fellows of the American Association for the Advancement of Science, a prestigious honor.

Rutgers Health is an education, research, and health care powerhouse, driving excellence in medical education, groundbreaking research, and exceptional patient care across New Jersey and beyond.

Rutgers Health Entities

Schools

- Ernest Mario School of Pharmacy
- New Jersey Medical School
- Robert Wood Johnson Medical School
- Rutgers School of Dental Medicine
- School of Graduate Studies (joint with RU – New Brunswick)
- School of Health Professions
- School of Nursing
- School of Public Health

Centers/Institutes

- Brain Health Institute
- Center for Advanced Biotechnology and Medicine
- Environmental and Occupational Health Sciences Institute
- Institute for Health, Health Care Policy and Aging Research
- Institute for Infectious and Inflammatory Diseases
- Rutgers Cancer Institute of NJ
- Rutgers Institute for Translational Medicine & Science

Behavioral Health Care Unit

- University Behavioral Health Care

Rutgers Health

Rutgers Health
Rutgers Health Group

Established
in 2016

RESEARCH ACROSS RUTGERS HEALTH SCHOOLS

Ernest Mario School of Pharmacy

Five academic departments are actively engaged in high-impact research programs, in areas that include drug discovery and delivery, experimental therapeutics, and pharmacy practice.

New Jersey Medical School

Researchers study brain injury, immunology and infectious diseases, stem cells and regeneration, public health, and neurology. The renowned Global Tuberculosis Institute is also housed at the school.

Robert Wood Johnson Medical School

Home to major research institutes that focus on a range of topics, from cardiovascular medicine to women's health.

Rutgers School of Dental Medicine

Research extending from the prevention of cavities and periodontal disease to potential therapies for cancer and drug-resistance illness.

School of Public Health

Home to a number of research centers including the Center for Public Health Workforce Development, Center for South Asian Quantitative Health & Education, and New Jersey's Center on Gun Violence Research, among the first such centers in the country.

TRANSLATING DISCOVERIES INTO HEALTH

Leveraging Expertise

Rutgers Health brings together world-class researchers, clinicians, and innovators to tackle complex health challenges and translate groundbreaking discoveries into practical solutions.

Accelerating Innovation

With state-of-the-art facilities, robust research infrastructure, and a collaborative culture, Rutgers Health drives the development of novel therapies, devices, and technologies that improve patient outcomes.

Fostering Partnerships

Rutgers Health forges strategic alliances with industry leaders, government agencies, and patient advocacy groups to ensure that scientific breakthroughs have meaningful impact on the health and well-being of individuals and communities.

Impacting Lives

From pioneering new treatments for chronic diseases to developing cutting-edge digital health tools, Rutgers Health is dedicated to transforming biomedical research into real-world solutions that enhance the quality of life for people across New Jersey and beyond.

ALIGNING RH INTEREST WITH INDUSTRY FOCUS

COMPANY INTEREST



Expertise

Scientific & clinical know-how



IP

Intellectual property (IP) and IP-enabling research



Clinical

Patients & disease expertise
Data & Specimens



Talent

Workforce development

Expertise

- Sponsored research (single projects)
- Master agreements (multi-projects)
- Consortia. - Co-development



IP

- Licensing agreements
- Research collaborations



Clinical

- Clinical Trials
- Clinical Research



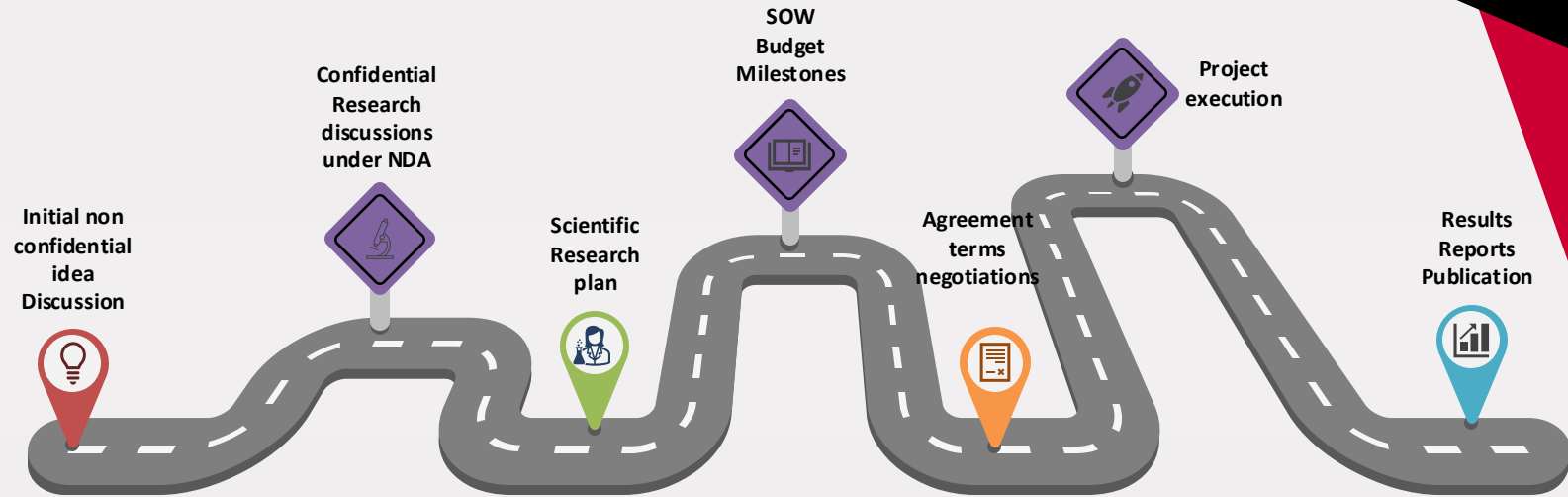
Talent

- Consulting
- Fellows, post-docs, graduate students, faculty



RBHS INTEREST

The RBHS Roadmap for a research Agreement



Rutgers checkpoints

The Business Research Development team assists the PIs with these checkpoints to make the collaboration move at Business Speed



Rutgers Internal process

The different units at the Office for Research facilitate every step the Rutgers' research administration process.

Rutgers Cancer Institute Overview

Christopher Molloy, PhD, RPh
Rutgers Cancer Institute
November 2024



Associate Director for BioPharma Alliances (RCI)



Christopher J. Molloy, PhD, RPh

- University Professor
- Distinguished Professor of Pharmacology & Toxicology
Rutgers Ernest Mario School of Pharmacy
- Drug discovery team leader at BMS, biotech, and J&J
- 2007 – Dean, Rutgers Ernest Mario School of Pharmacy
- 2011 – Interim Provost managing Rutgers/UMDNJ integration
- 2013 - Post integration, Senior VP for Research and Economic Development
- 2018 - Chancellor, Rutgers University – New Brunswick

Mission

- Identify and facilitate industry relationships to increase clinical and research competitiveness
- Increase external research funding through corporate and other strategic collaborations
- Represent CINJ with specific internal and external audiences.
- Connect clinicians and researchers with Rutgers resources supporting technology transfer, patents, licensing, and business development.

Historic Timeline



NCI P20 Planning Grant
UMDNJ: MA Gallo

1992



Founding Director
UMDNJ: WN Hait

1993



Consortium with
Princeton University

1994



75,000 sq. ft.
Facility

1996



NCI Designation
Conferred

1997



Comprehensive Cancer
Center status conferred

2002



125,000 sq. ft.
Facility Expansion

2004



Director
RS DiPaola

2008



UMDNJ integrates
into Rutgers University
Cancer Center is an
Independent Institute

2013



Director
SK Libutti

2017



CGSG Renewed -
Year 20

2019



Integrated Practice
Agreement with RWJBH

2021



CGSG Renewed -
Year 25

2024



Jack and Sheryl Morris
Cancer Center

2025

The State of New Jersey

9.3 million people within 1,263 sq. mi.

1st

in population density – 9.3 M people within 1,263 mi²

6th

most ethnically diverse state

7th

in cancer incidence (2021)

Racial, ethnic and socioeconomic disparities

in cancer incidence, mortality and access to care

23%

of New Jersey residents are foreign born

10%

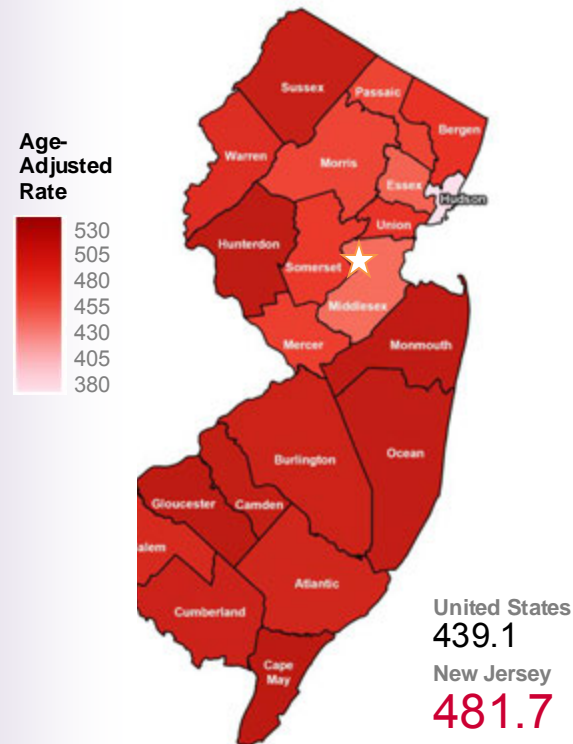
of households fall below the national poverty level

10-23%

higher cancer rates in Rutgers Cancer Institute high-priority areas

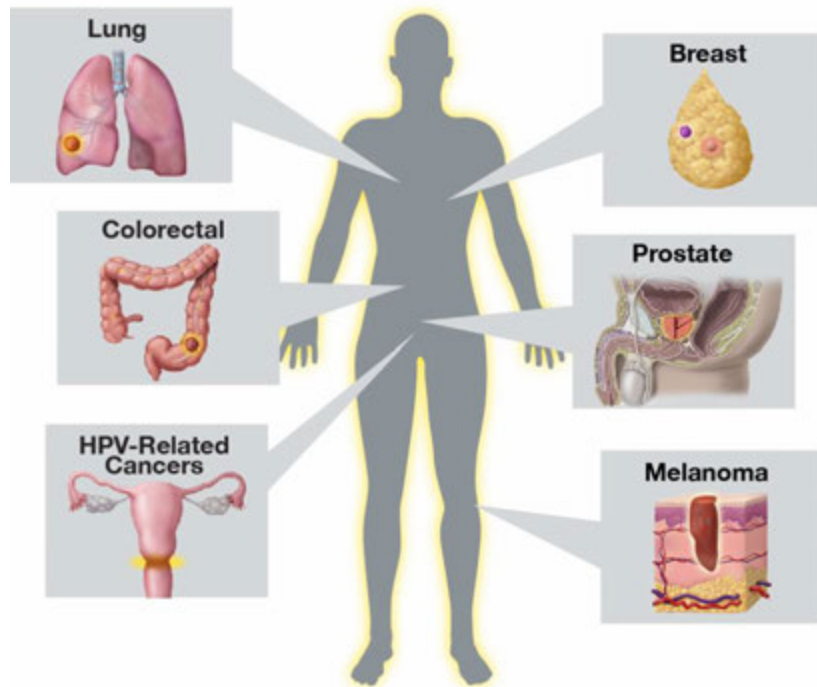
Age-Adjusted Cancer Incidence Rates

(Per 100 K, all cancer sites combined, 2021)



Catchment Area Priority Cancers and Risk Factors

Priority Cancers



Risk Factors (and Icon Key):

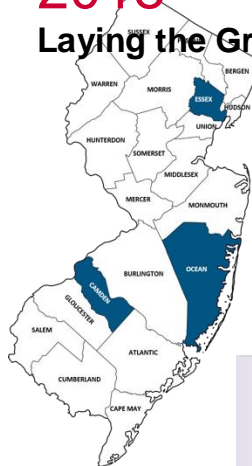
-  Obesity/Metabolic Dysregulation
-  HPV Infection
-  Tobacco Use
-  Environmental Exposures
-  Hereditary Cancers
-  Access Barriers
-  Social Determinants of Health

ScreenNJ Partners: Impact and Reach



July 2017 – June 2018

Laying the Groundwork



- 20 clinical & outreach partners
- 3 counties

Community partnerships

Awareness, prevention, screening & timely diagnosis/treatment

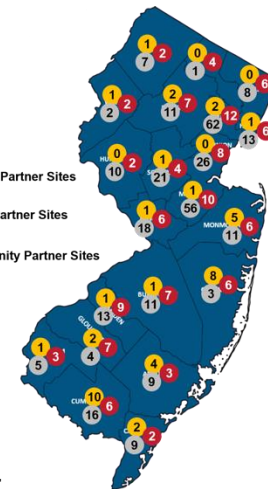
Greater statewide reach

July 2018 – Aug 2024

Statewide Expansion

- 292 clinical & outreach partners
- 522 sites
- All 21 counties

- 118 Clinical Partner Sites
- 44 FQHC Partner Sites
- 360 Community Partner Sites



34,500+
Tobacco cessation counseling

98,000+
Patients navigated to screening

7,700+
Cancers and premalignant lesions detected

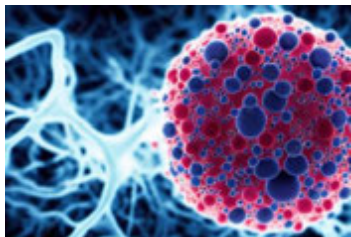


NJ Regional Health Coalitions

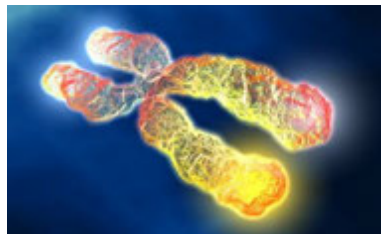


CCSG Research Programs

Cancer Metabolism and Immunology



Genomic Instability and Cancer Genetics



Cancer Pharmacology



Clinical Investigations and Precision Therapeutics

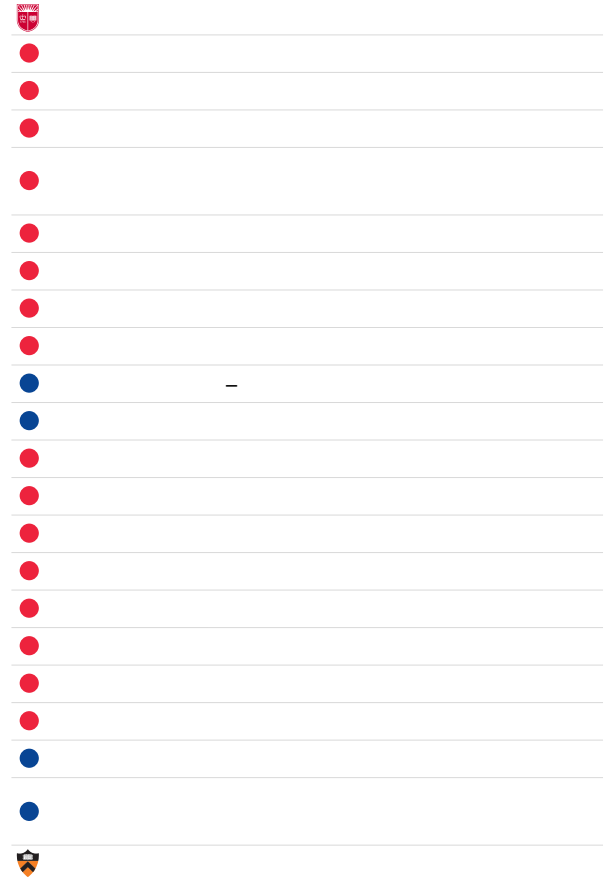
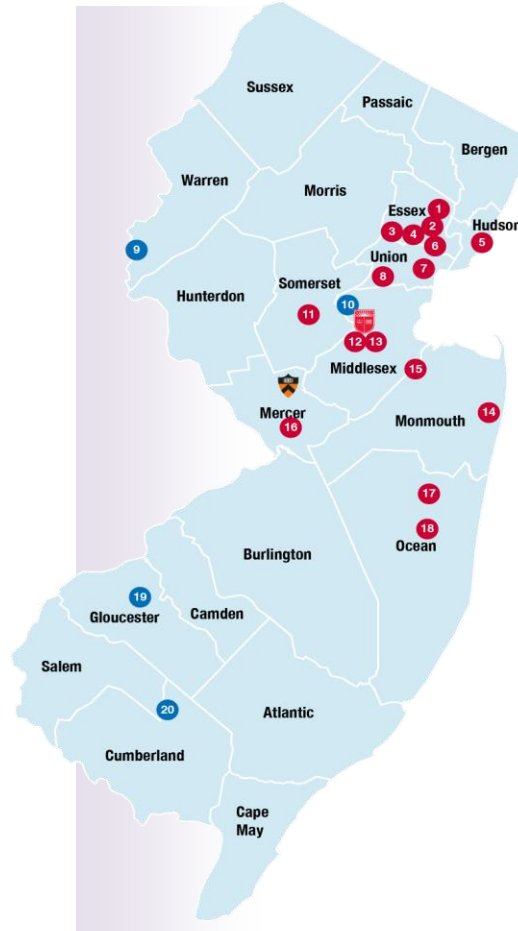


Cancer Prevention and Control



Rutgers Cancer Institute System

- 12 adult hospitals across NJ
- One Oncology Service Line
- Clinical trials open and actively accruing at 10 (RWJBH) and 2 (CINJ) sites
- All System Sites with open trials
- New Affiliates



Unified Clinical Trials Infrastructure

Our Vision (2018)

- One IRB**
- One Contract/Budget process**
- One EMR**
- One CTMS**
- One Pharmacy**
- One Clinical Trials and Quality Assurance Office**

Accomplished
2018-
2022

Unified Clinical Trials Infrastructure

Our Concept:

Centralized

- Operations
- Data Management

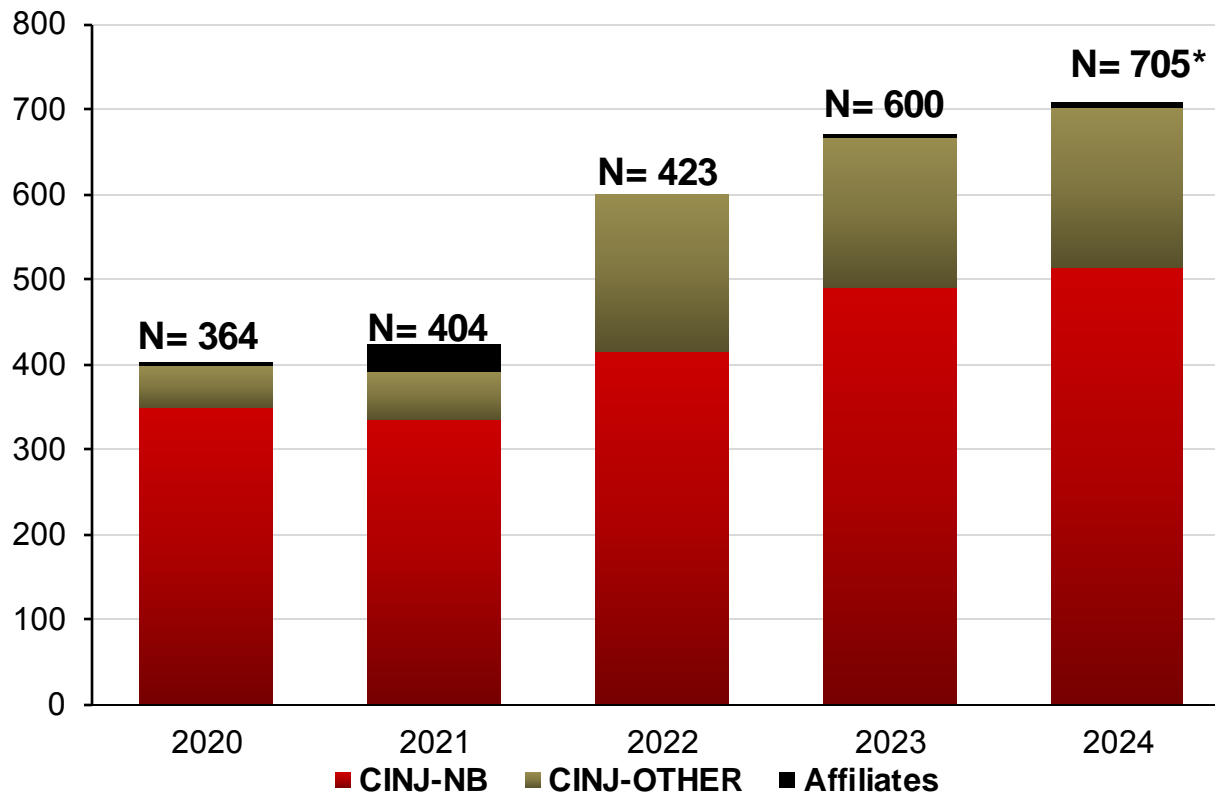


Sites Contribute

- Ideas
- Protocols
- Principal Investigators
- Patient Enrollment
- Data Management



Interventional Treatment Enrollment (2019-2024)

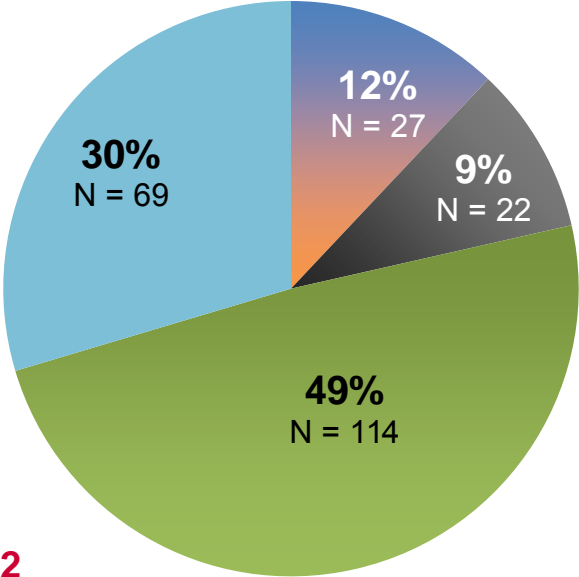


Clinical Trial Portfolio 2023

Treatment protocols 232
Interventional non-treatment + 24

Total Interventional Trials 256

Interventional Treatment Protocols

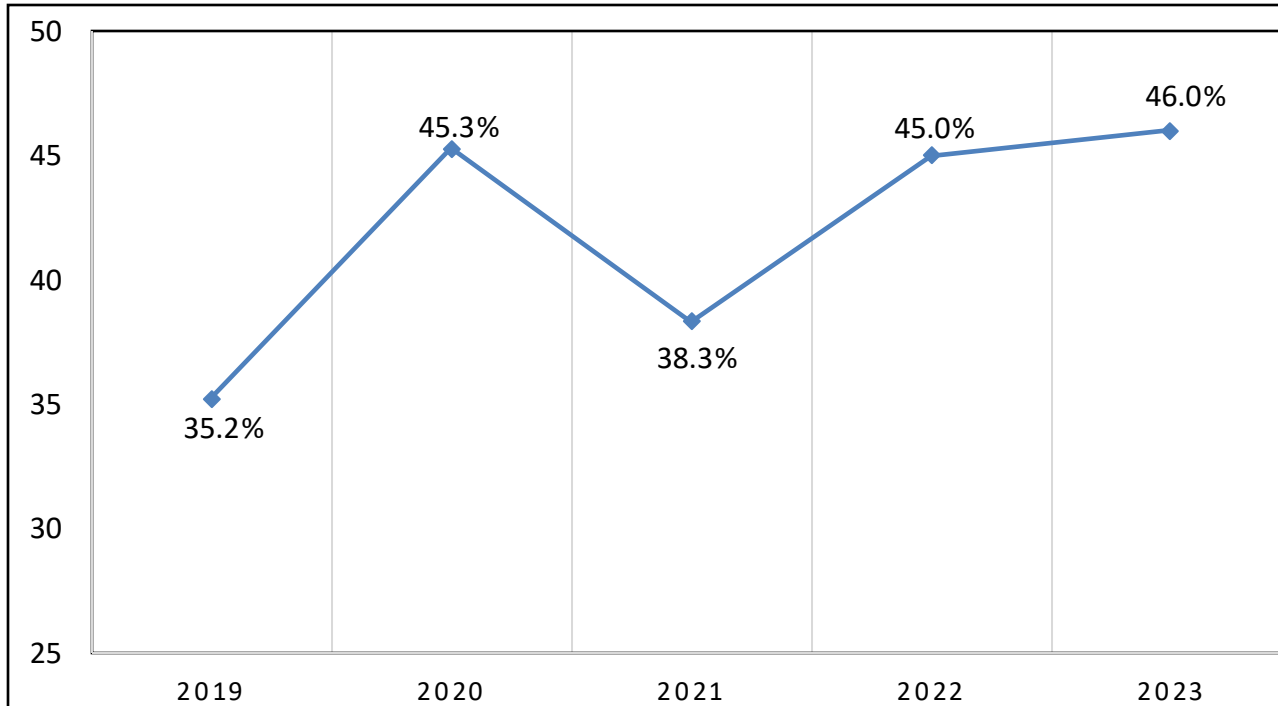


N = 232

■ Institutional ■ Externally Peer Reviewed ■ Industry ■ National

Accrual of Minorities to Therapeutic Trials

Minority Enrollment to Interventional Therapeutic Trials (2019-2023)



18
%



Clinical Trial Collaborations



Teaming up to fight cancer

22

**Trials
Activated**

11

**Rutgers
Cancer
Institute PIs
(CIPT)**



Growth: Facilities and Clinical Services



New Brunswick Today

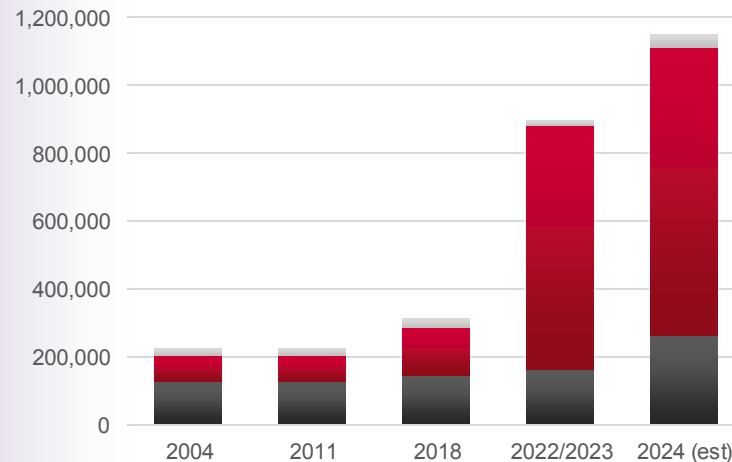
- Primary clinical and research facility (225,000 sq. ft.)
- Dedicated oncology space (36,000 sq. ft.)
- Leased Administration (40,000 sq. ft.)
- RWJUH Oncology Hospital



New Brunswick Planned

- 520,000 sq. ft. Inpatient/Outpatient Morris Cancer Center
- Completion 2024

Total Cancer Program Allocated Space (sq. ft.)



- **Research** (Wet and dry laboratories, OHRS)
- **Clinical** (Patient care, Practice Management, clinical faculty/staff offices and workstations, patient/physician/nursing education)
- **Administrative** (Administration, Finance, IT, COE, DEI, CRTEC)

Jack and Sheryl Morris Cancer Center



Outpatient Care

- 86 infusion bays
- 84 exam rooms
- 4 linear accelerators; other advanced radiation oncology
- Diagnostic radiology equipment (e.g., CT, MRI, PET, mammography)
- Core and clinical laboratories
- Pharmacy
- Outpatient Urgent Care



Inpatient Care

- 96 private room inpatient beds on three floors
- Dedicated floor for nine surgical and two procedure rooms
- Central sterile processing area
- Inpatient support spaces



Research

- 10 wet lab facilities and equipment to support ten research teams
- Office of Human Research Services
- Faculty offices

Thank You

Q&A Segment



RUTGERS

Cancer Institute
of New Jersey

RUTGERS HEALTH



Future Plans

- 1 Continue to invest in Cancer Immunology and Metabolism, through faculty recruitment and infrastructure development
- 2 Complete construction of and operationalize Jack and Sheryl Morris Cancer Center and new RWJBH oncology outpatient facilities in Livingston and Monmouth
- 3 Continue to increase multi-project grants, leveraging opportunities with University
○ a U01 within the CPC Program, and collaborations with other NCI-designees
- 4 Continue to expand impact on the catchment area made possible through the launch of the new mobile unit and doubling of the ScreenNJ budget
- 5 Reduce the cancer burden, improve outcomes and address health equity through multidisciplinary research, outreach and community
- 6 Implement diversity plan to increase and enhance representation among members and leadership



Develop 2026 – 2030 Strategic Plan



New Jersey Alliance for Clinical and Translational Science (NJ ACTS)

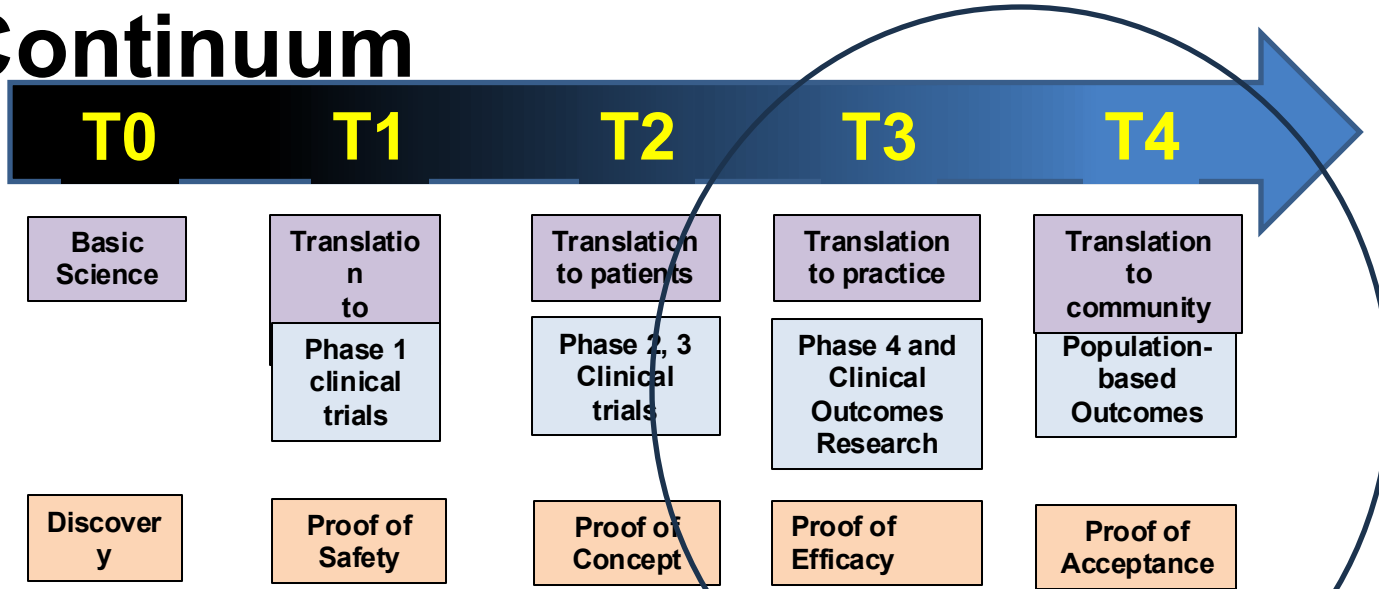
Reynold A. Panettieri, Jr., M.D.
Vice Chancellor for Translational Medicine and Science

<http://njacts.rbhs.rutgers.edu>





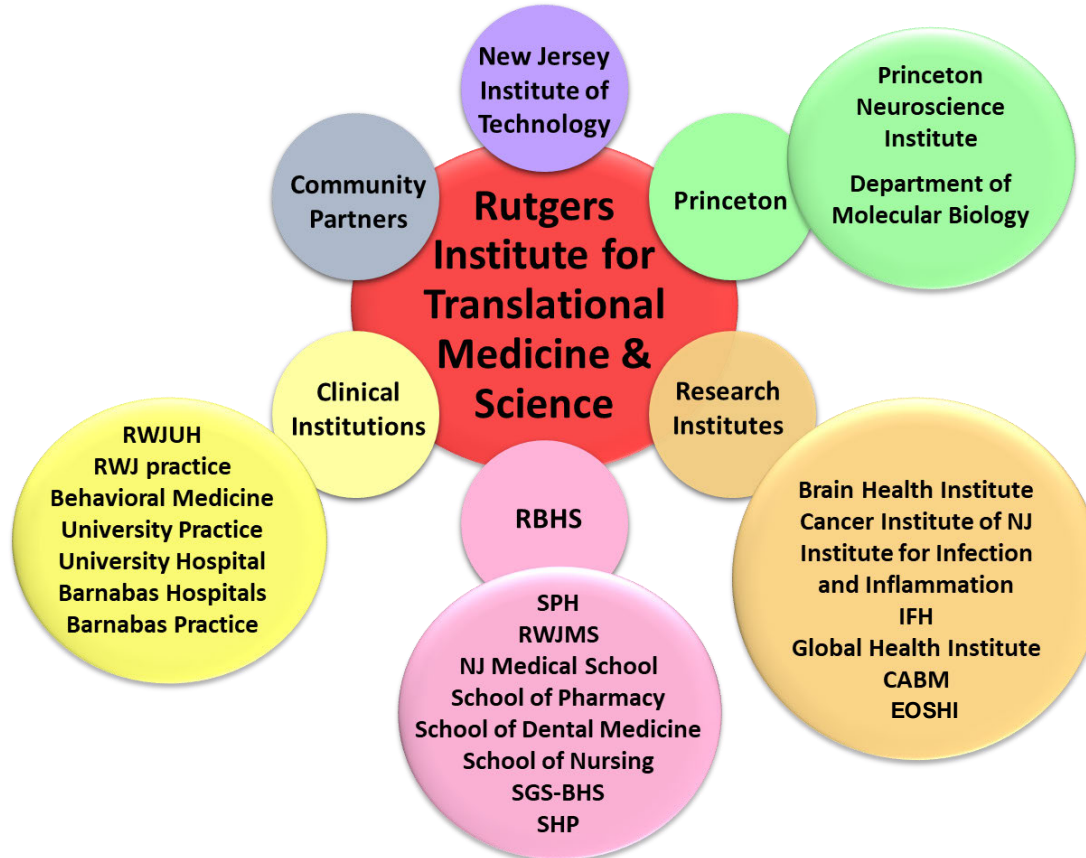
Translational Research Is a Continuum



Academic assets for commercialization include new drugs, devices, diagnostics and software



New Jersey Alliance for Clinical & Translational Science

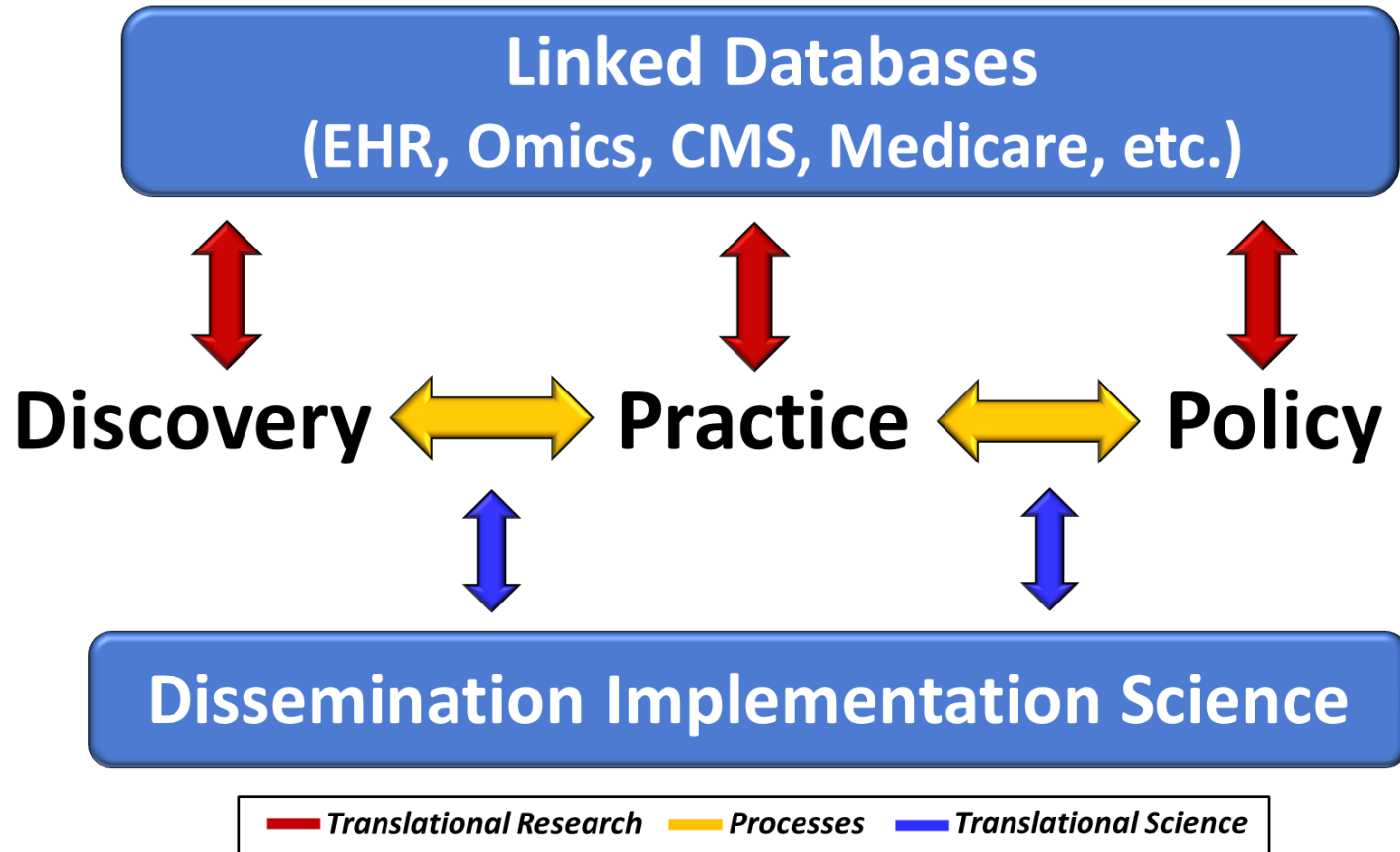




Transformative Accomplishments over 5 years

- Established and implemented a Clinical Research Data Warehouse (CRDW).
- Built a robust Pilot Program fostering alliance partner collaboration.
- Supported a microcredentialing and badging program across Cores.
- Fostered a network of networks for community engaged research.
- Served as the Biomarker Core for the national pediatric Recover Program.
- Created a unique Clinical Trials Office to facilitate and catalyze clinical trials execution.
- Support the career development of 12 KL2 Scholars, 19 Predoc and 13 Postdoc trainees.
- Successfully competed for the continuation of NJ ACTS for 7 years.







Clinical Trials Office

Why create
a Clinical
Trials
Office?

- Mandate through CTSA to improve the efficiency & quality of the clinical trials conducted here; the goal is also to increase the volume of trials
- Scope: Rutgers Health non-oncology clinical trials and non-clinical trials with billable clinical procedures



Rutgers Institute
for Translational
Medicine & Science

Workflow today

team
submits
documents
through
OnCore
ePRMS
(before
IRB &



CTO
Feasibility
Navigator
reviews
submission,
conducts
Intake
Assessment



used in OnCore to
delegate:

1. Contract negotiation
2. Budget Negotiation
3. Medicare Coverage Analysis
4. Study Build in OnCore
5. Partner Hospital

*UH-Newark: CTO handles partner hospital submission responsible

RWJBH: Study teams are



Translational Research Home- RH Building



The Development

- Preliminary site plan and building sizes have been revised
- RH Building (RWJMS, Translational Research, Chancellor Office) is largest occupant in first building



9



- Phase 1 – RH space, Lab and Office, Innovation Hub/Coworking, RU-NB space
- Phase 2 – Nokia Bell Labs
- Phase 3 – TBD

Questions?

40



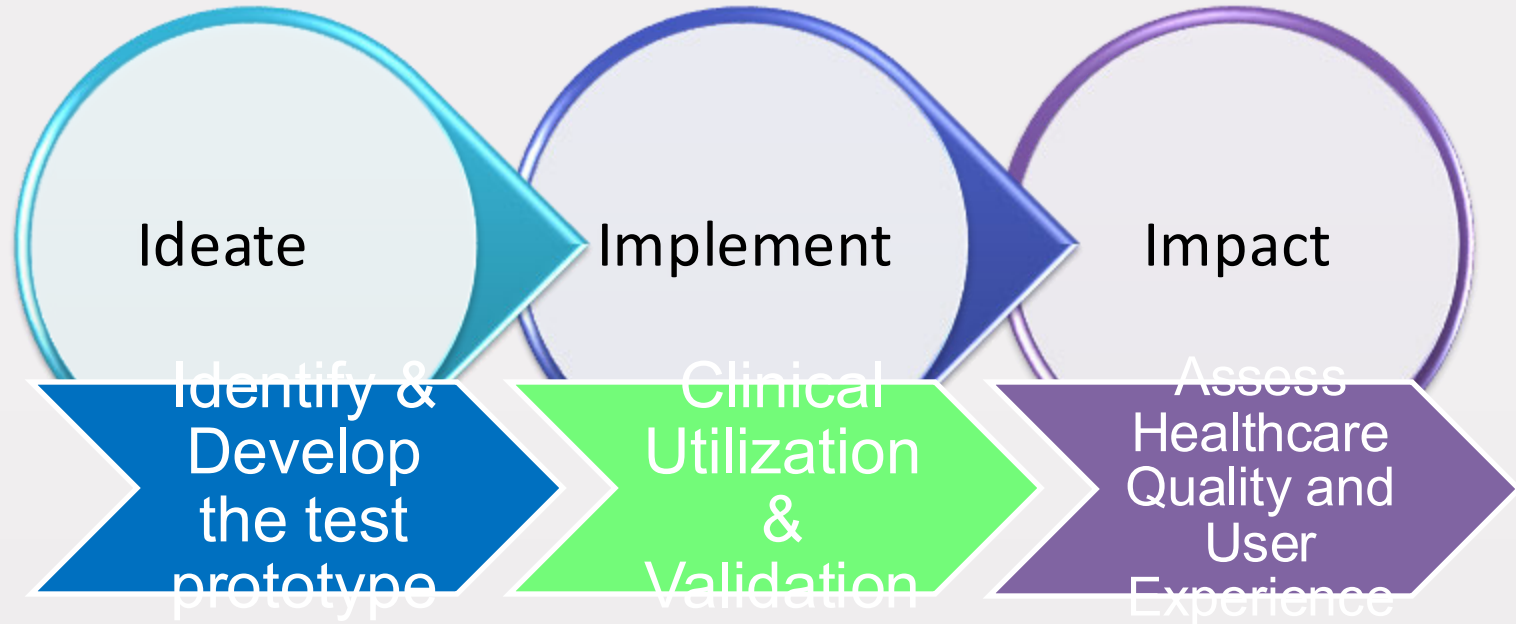
RUTGERS HEALTH



Center for Innovation

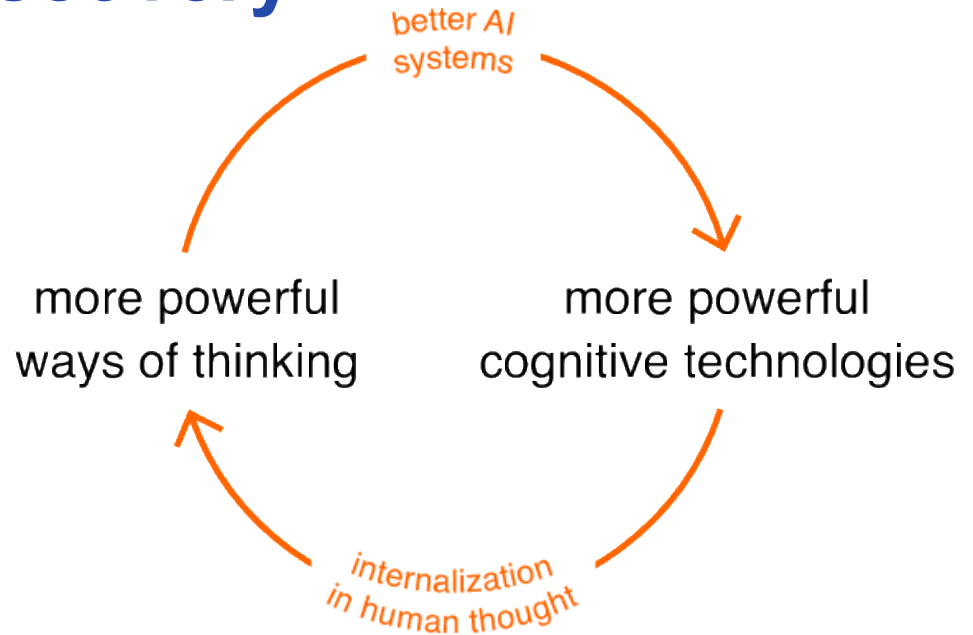
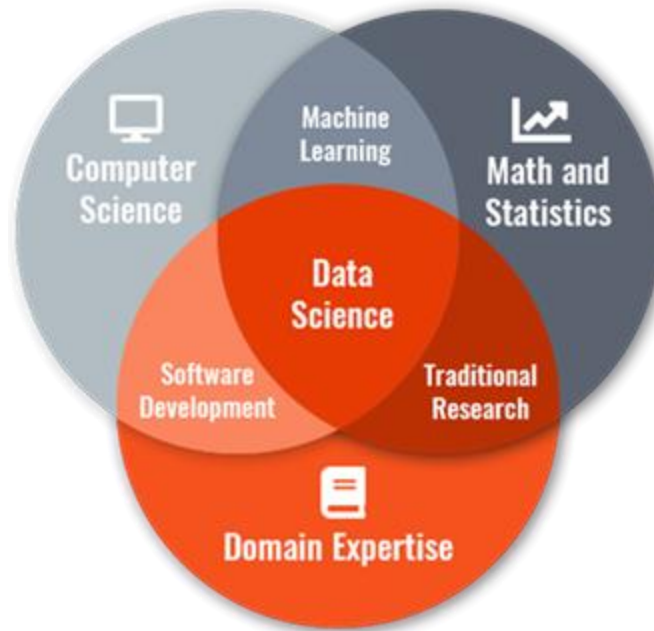
Advancing Health through Digital Technologies and
Strategic Partnerships

i³ - Innovation Model for Healthcare



Drive transformation and innovation in cardiovascular education, research, and clinical care

Use of Analogies : Data-driven Knowledge Discovery



Digital transformation of any domain will not be technology, but mirroring of AI and IA – promoting creativity and innovation.

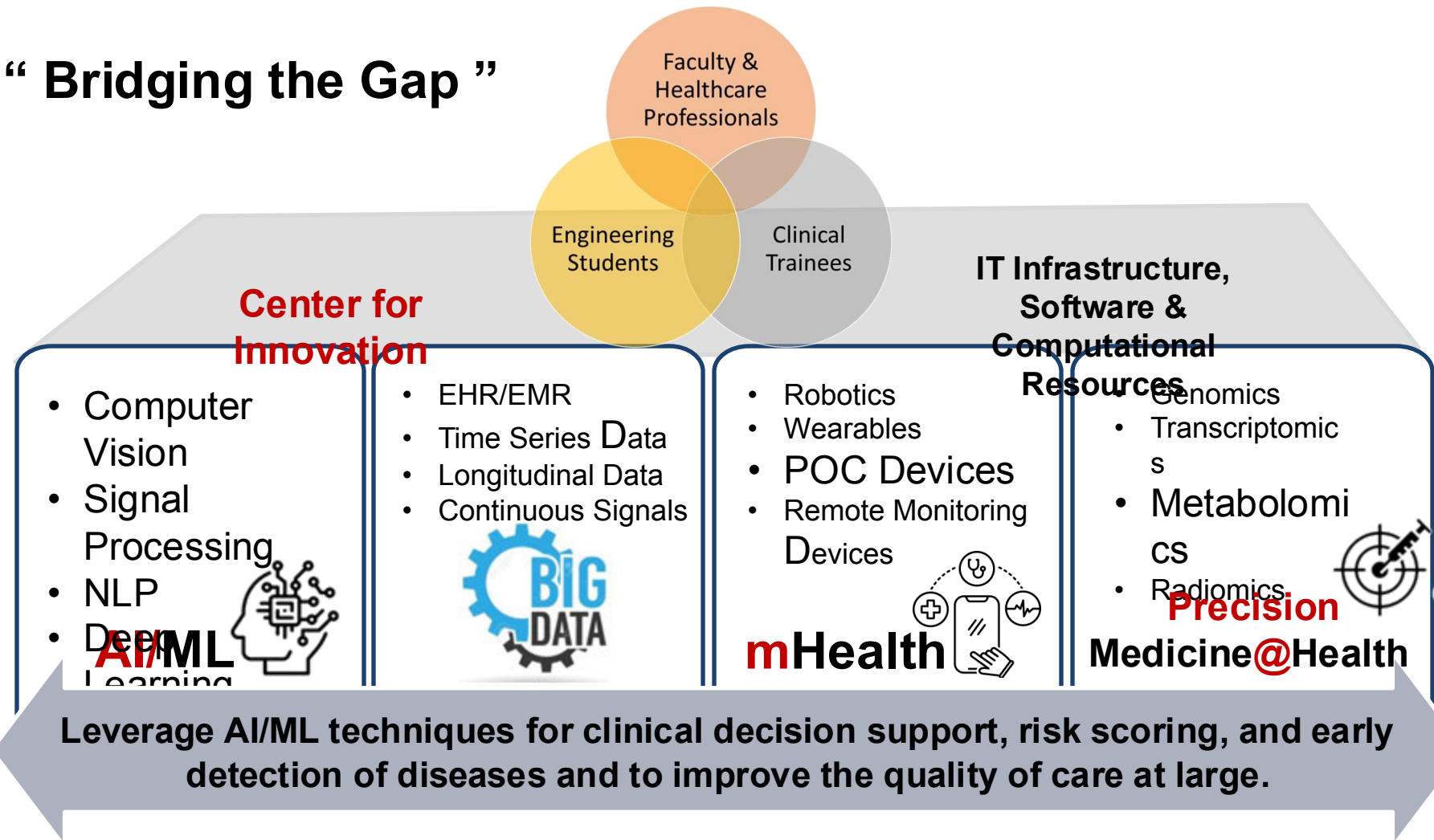
Sep 14th,
2022



CREATING SOLUTIONS WITH TECHNOLOGY

A NEW CENTER FOR INNOVATION BUILDS PATHWAYS TO MEDICAL BREAKTHROUGHS.

“ Bridging the Gap ”



Center for Innovation: Partnerships

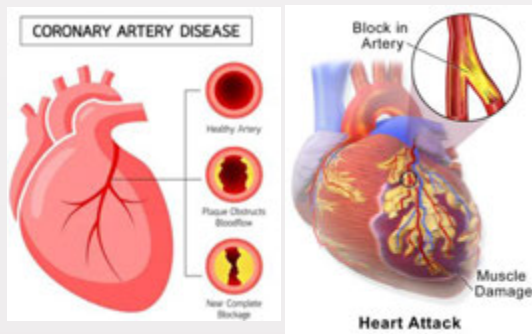


Center for innovation: New Breakthroughs

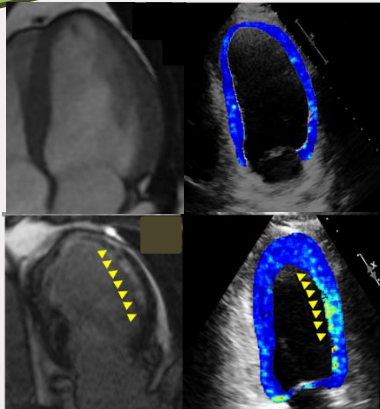
Point of Care Ultrasound Devices (LEVEL-2 SCREENING)



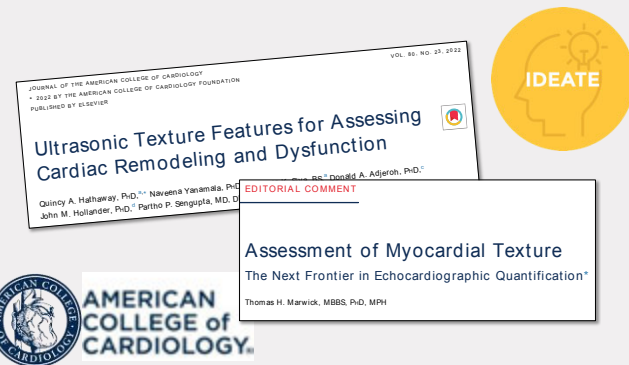
Ultrasonic Texture Features



Predicts severe obstructive and high-risk CAD better than

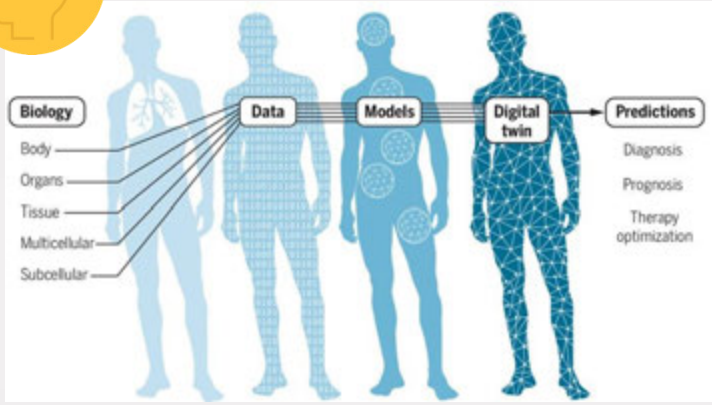


Distinguishes between healthy & infarcted



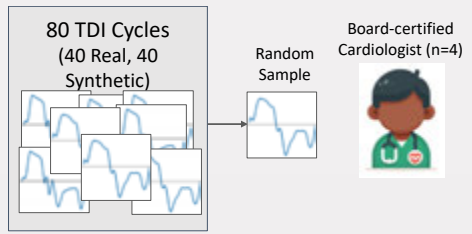
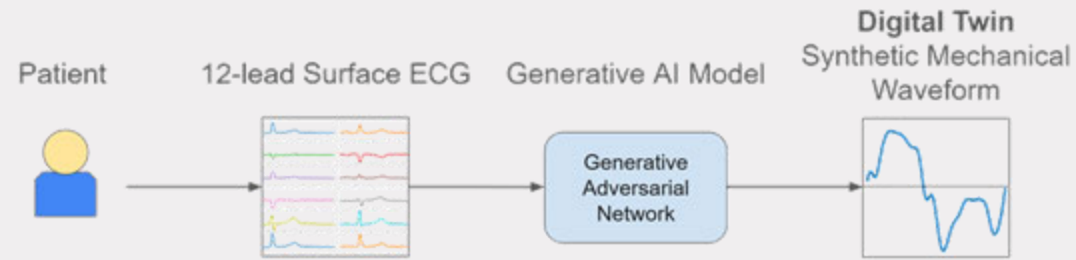
Opens new opportunities for advancing myocardial tissue characterization using basic echocardiography imaging, which was **previously only possible through advanced imaging**

Center for innovation: New Breakthroughs

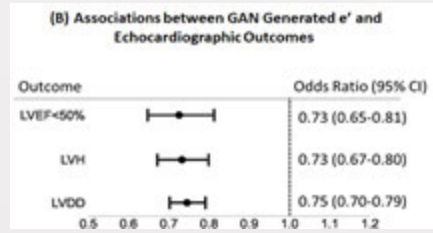
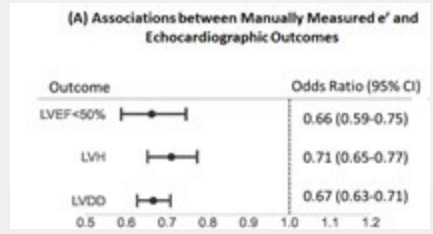


Digital Twin

Virtual representation of a patient. Seamlessly integrates their clinical data collected over time.



Cardiologists were unable to discriminate between **real** and **synthetic TDIs**, demonstrating the realism of the GAN based waveforms.



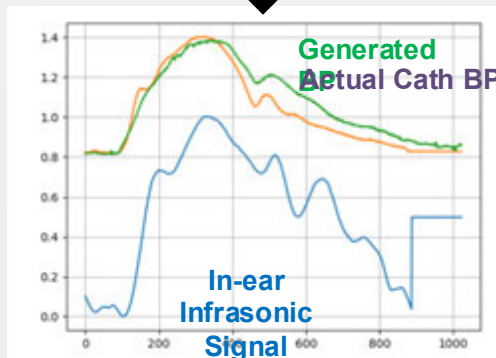
Generative AI to synthetically generate Digital Twins

Center for innovation: New Breakthroughs

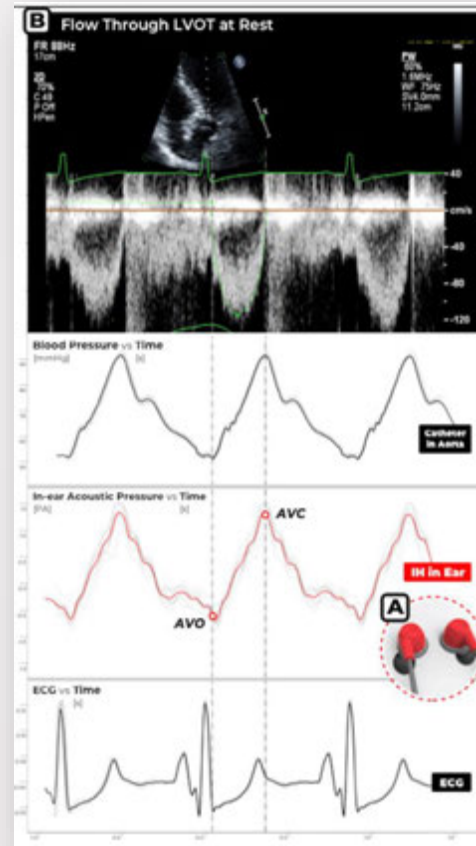


Technology that goes beyond just sound & music to “Hearing the Heart”

ECG/EKG POC Devices/Wearables (LEVEL-1 SCREENING)
Clinically validated & shows 99% correlation with hospital-grade ECG



Invasive Blood Pressure monitoring using

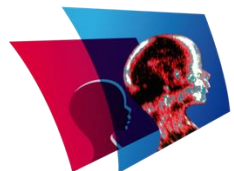
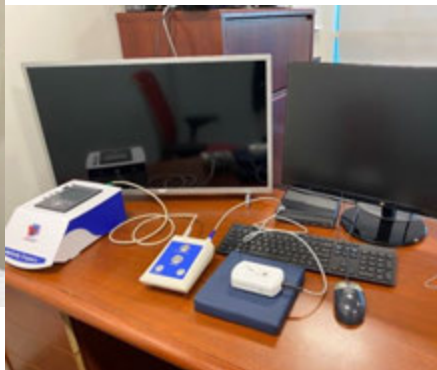


Center for innovation: Ideate to Implement

Patient Site : CRC



Expert Site



Installation of a Clinical Robotic
Tele-Ultrasound System.
First in the US!

AdEchoTech
Imaginons ensemble l'image de demain
Let us picture the future

Future : Command Centers & Care Pods

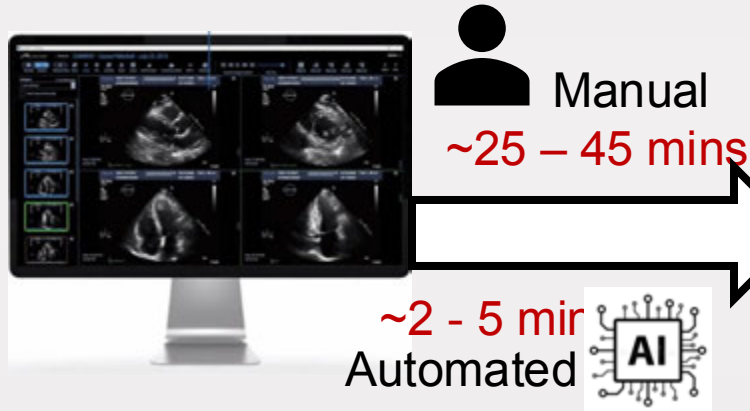


Center for innovation: Ideate to Implement

Partnership with Us2.ai to Bring an AI-assisted
Echocardiography Integration to Cardiovascular Workflow

WORKFLOW
WITH MACHINE

More time for "humane" work

A screenshot of a web-based report interface. The header shows "Report" for "Niko Dave" with ID "TMP_Q0V55YR8". The main content is titled "US2 AI Measurements" and includes a "Pro Tip" and a table of findings. A heart image on the right shows a red outline of the left ventricle.

Main Findings	Details
LV Systolic Function	Normal
LV Geometry	Concentric remodeling
LV Size	Normal
RA Size	Normal
LA Size	Normal

Notes: Please correlate clinically.

- Easy.** Zero clicks to a full report with disease detection
- Fast.** 2D, Doppler & Strain, all auto-measured in real time
- Accurate.** No variability, interchangeable with experts, worldwide regulatory approvals
- Everywhere.** Connect to echo CARTs, CVIS, PACS, on-prem, mobile or cloud

Augmented Physicians: Fight burn out & promote standardization of care across the Health System



Innovation & Beyond

Community based Cardiac Screening Events



Partho P Sengupta
@ppsengupta1



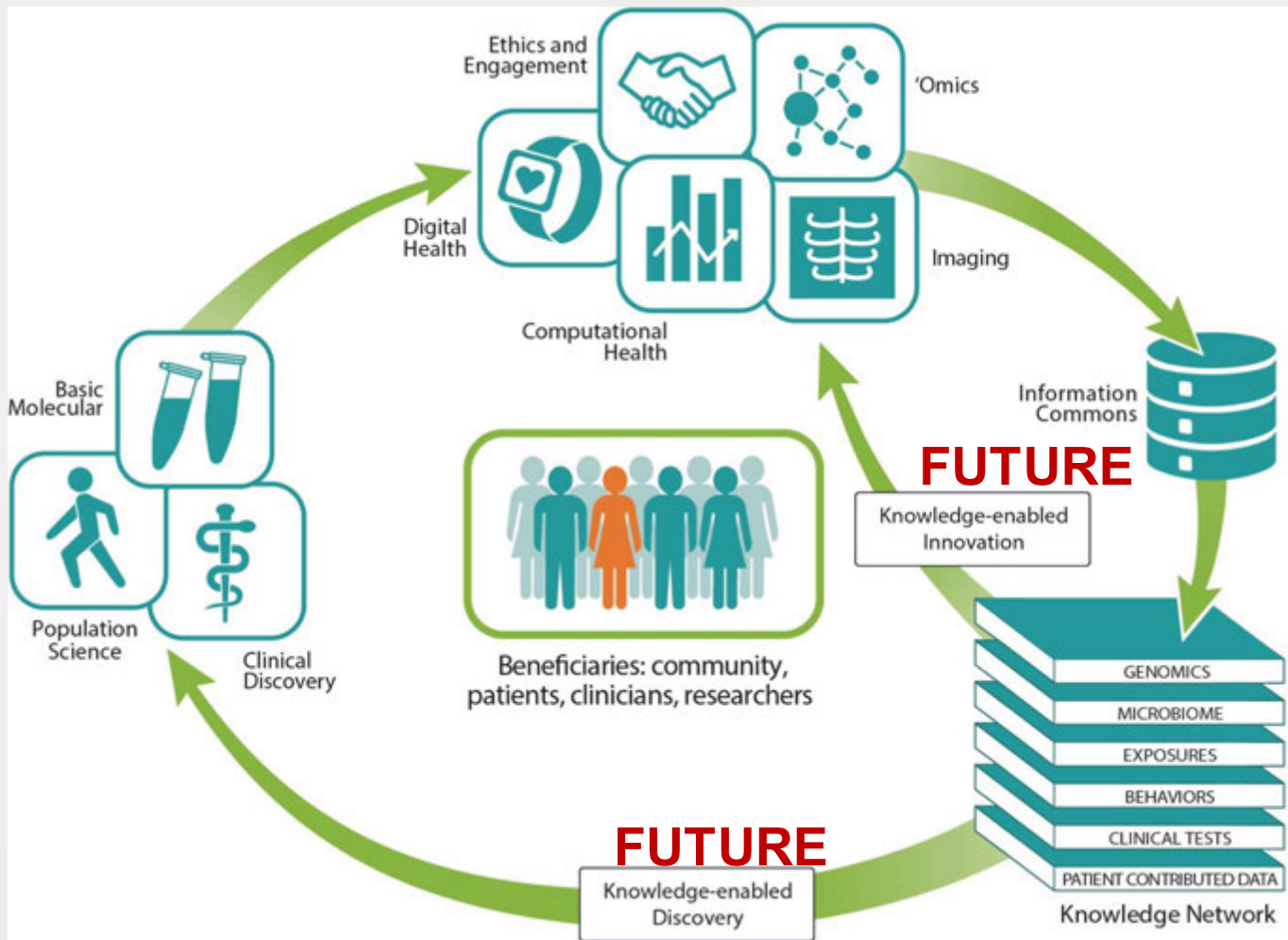
2024 Black Alumni
Collective National
Conference

@RWJMS and @RWJUH Division of Cardiology volunteered at Rutgers Black Alumni Health Fair event with free cardiac screening—cutting edge digital tools offered to attendees—digital transformation for healthier communities! @YanamalaNaveena @RU_Foundation @rutgershealth



2:40 PM · Jun 1, 2024 · 180 Views

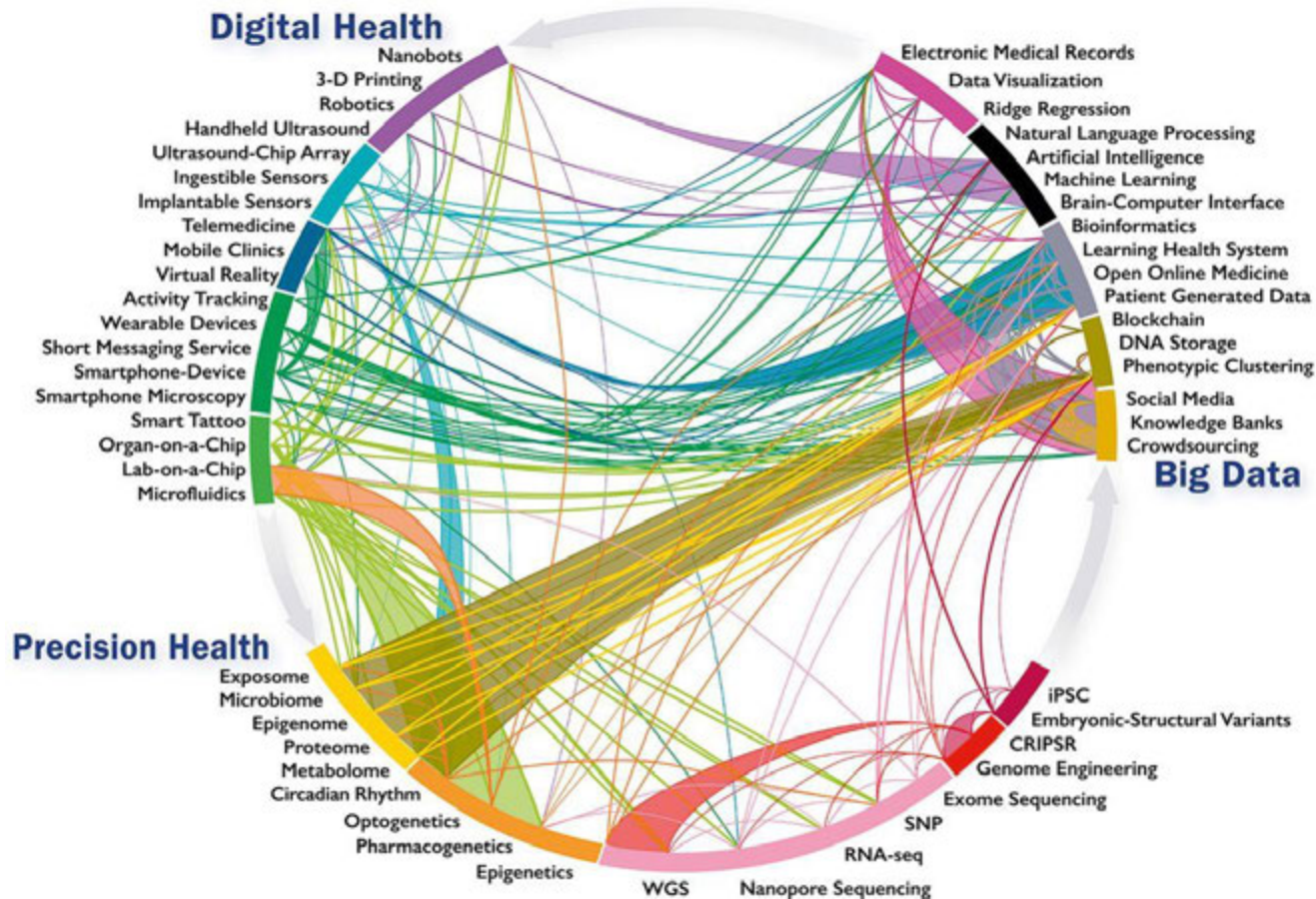
Leverage modern innovations to advance cardiac health, enhance preventive care, and foster community well-being.



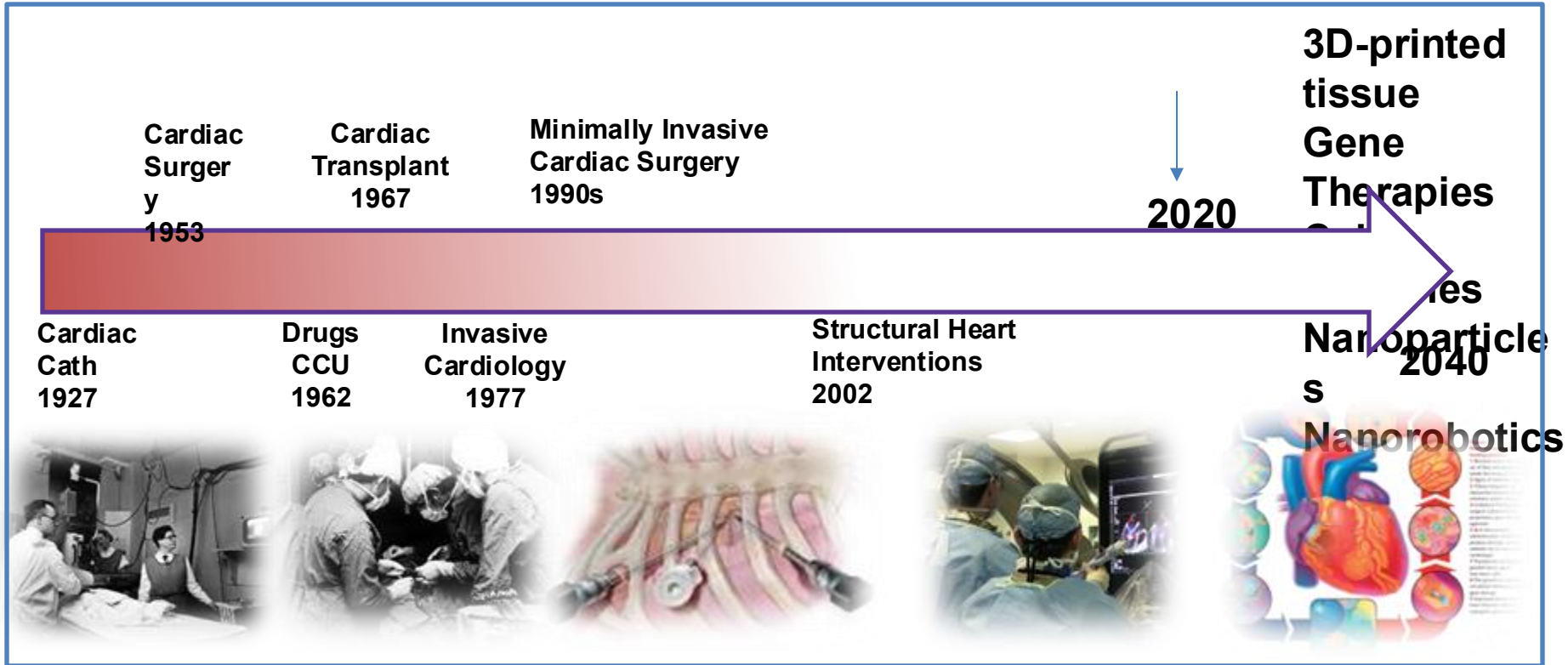
Ongoing Efforts

- Rutgers Clinical Data Warehouse
- RWJUH Data Lake

'Innovation Genome' : Precise & Personalized Medicine



Innovations in Cardiovascular Therapies



A Paradigm Shift in How Healthcare is Delivered

REACTIVE → PREVENTIVE

MEDICINE → WELLNESS

HOSPITAL → HOME

WEALTHY → MASSESS

Thank You!



yanamala.naveena@rutgers.edu

 @YanamalaNaveena

Embracing AI as a partner in healthcare enhances patient care, boosts diagnostic accuracy, and fosters medical innovation...



**Deborah Perez
Fernandez, Ph.D.,
M.B.A.**
Executive Director,
Technology Transfer

Technology Commercialization

Why Technology Transfer

Bayh-Dole Act of 1980

Universities and nonprofits are allowed to commercialize inventions resulting from federal funding



IMPACT society with innovations

RAISE visibility of university research

RECRUIT, RETAIN, AND REWARD faculty, post-docs and students

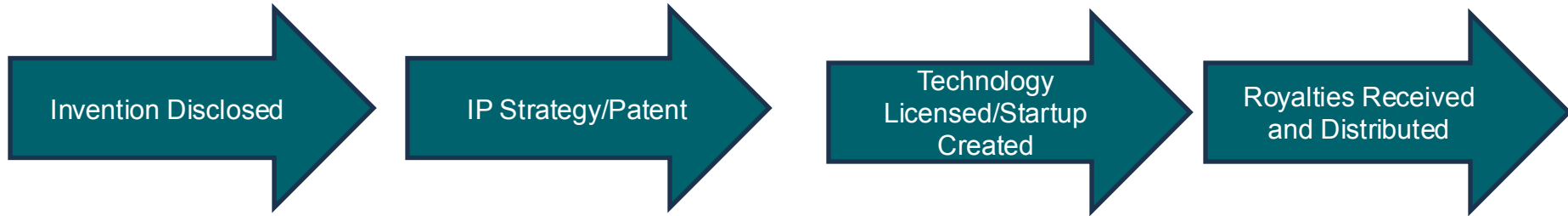
STIMULATE economic development

CREATE new collaborative funding opportunities

RECEIVE credit and recognition for contributions

How It Works

The Technology Transfer and New Ventures Teams Are Here to Assist Throughout This Process



<https://research.rutgers.edu/faculty-staff/inventions-commercialization/submitted-invention-disclosures>

Technology Transfer and New Ventures = Rutgers Innovation

Technology Transfer

Assess Notice of Invention (NOI)

Determine IP strategy

File for patents/trademarks/certificates

Market innovation and find suitable partners

Negotiate and execute licenses and other agreements

Maintain an accurate database of all innovations

Ensure compliance including with Bayh-Dole Act

Ensure contract compliance

Innovation Recognition/Showcase Awards and Events

New Ventures

Rutgers Business and Startup Mentoring/Consulting

Provide access to education (e.g. NSF I-Corps, Activate)

Review pitch decks before sending to investors/funders

Introduction to service providers (e.g. lawyers)

Identify and approach business founders

Identify and access funding opportunities

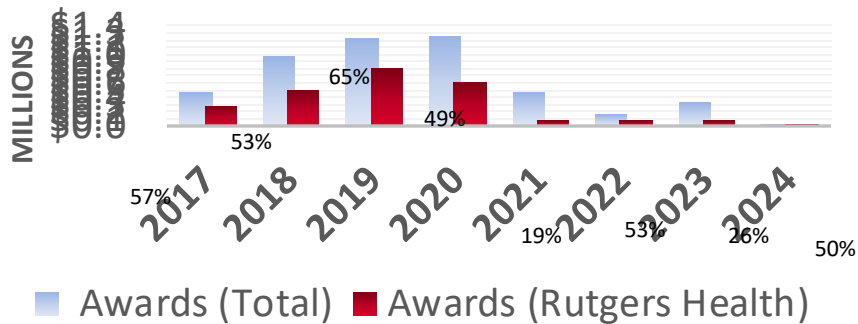
Events with featured speakers

Assisting with business development

Manage the TechAdvance/HealthAdvance Funding

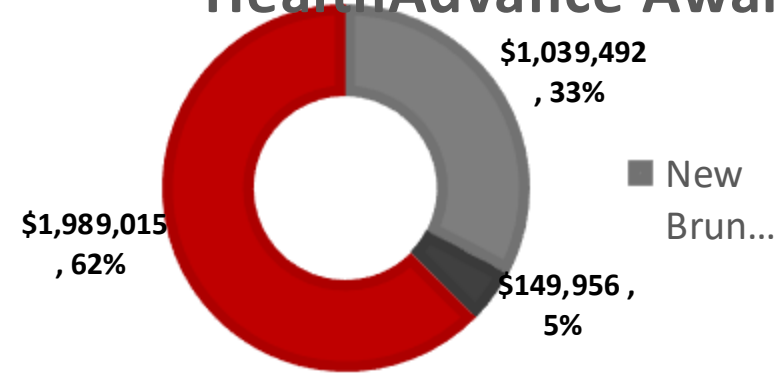
HealthAdvance & TechAdvance Create Follow-On Funding

TechAdvance Awards



TechAdvance Numbers Since 2017	
Funding Rate	~80%
Total Funding Disbursed	> \$ 4.9 M
Follow-on Funding	~ \$17.4 M

HealthAdvance Awards



HealthAdvance Numbers Since 2020	
Funding Rate	~53%
Total Funding Disbursed	> \$ 3.6 M
Follow-on Funding	~ \$11.1 M

* Includes 1 NIH RADx-Rad Award

Technology Transfer Trainee Program

150+

Interns, Fellows and Trainees
Trained Since 2009

Interns, Trainees, and Fellows Learn:

- How to protect and commercialize the results of scientific research.
- How to evaluate an Invention Disclosure, prepare Non-Confidential Summaries, and identify and reach out to prospective licensees.
- Business terms of various agreements that govern Technology Transfer in an academic university.

Fiscal Year 2024 Outcomes

162

Invention Disclosures

1,387

Active Technologies

290

New Agreements Signed

9

New Startups

\$12M

Licensing Revenue
Received

128

Global Patents Issued

56

Licenses and Options
Signed

~\$1.9M

Gap Funding

Successes



Estée Lauder - Moringa anti-inflammatory, anti-aging skin cream



Cytotracker Leuketometer - Handheld white blood cell tracker



Axion – 100 % recycled plastic railroad ties



Medtronic – absorbable antibacterial envelope for implantable devices



Disease resistant basil plants

FY24 National Academy of Inventors Fellows

Fred Kramer
Patrick Sinko

FY24 Edison Patent Award Winners

Charles Dismukes
Martha Greenblatt
Andres Laursen
Karin Calvinho
Abraham Pinter
Alok Choudhary

Questions

innovate@research.rutgers.edu



Discussion



Thank you: Najwa Borkadi