PENN CENTER FOR INNOVATION

Year in Review

FY21

Penn
University of Pennsylvania

Office of the Vice Provost for Research

A message from our Managing Director

The past fiscal year was unlike any other in the prior history of technology commercialization at the University of Pennsylvania. Despite unprecedented operational and logistical challenges caused by the impacts of the pandemic, PCI helped to facilitate a record-breaking year in terms of commercialization activity at Penn that further extends Penn's already prodigious global technology and innovation impact. PCI also continued its steadfast focus on increased client services through our active faculty outreach and corporate connecting efforts, virtually hosting numerous programs and stakeholder engagement activities.

We remain deeply grateful for the consistent support from Vice Provost for Research Dawn Bonnell and the rest of Penn's executive leadership led by President Amy Gutmann and hope that our commercialization activities represent a direct reflection of her amazing tenure and legacy as Penn's President. As a result of the vision articulated in Dr. Gutmann's ambitious Compact 2022, PCI, Penn, and its research and development community continue to be strongly positioned for technology commercialization and translational partnership.

John Swartley, PhD
Associate Vice Provost
and Managing Director
Penn Center for Innovation

Major Accomplishments

>$300M

Facilitated the highest amount of aggregate licensing revenue at Penn in PCI's history

142

The most patents ever issued to Penn and its faculty inventors in one year

>$130M

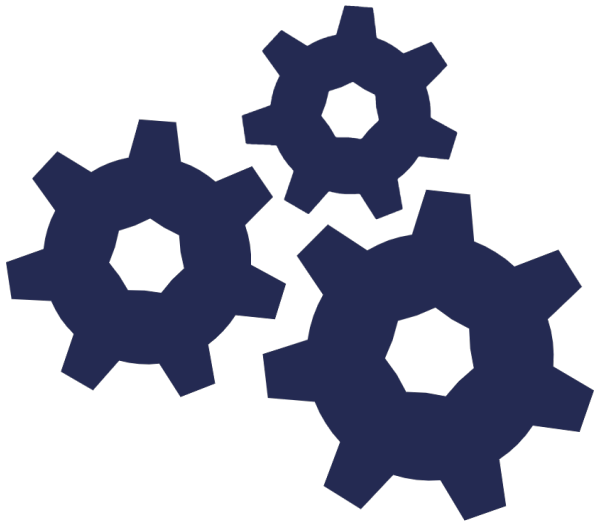
Received for industry Sponsored Research Agreements

>$815M

Funds raised by Penn-affiliated startups, the most ever

COVID

Penn's patent-protected mRNA technology included in first FDA approved COVID vaccines, helping to save millions of lives globally



commercializing

Penn Engineer invents DNA sequencing and SNP detection technology

Arjun Raj, PhD, Assistant Professor in the School of Engineering, was named as an inventor on an issued patent for technology that captures an innovative method to detect Single Nucleotide Polymorphisms (SNPs) and changes to a single DNA base pair in a genetic sequence, that overcomes traditional off-target binding associated with previous approaches. The technology has been licensed to LCG Biosearch for use in their genomic analysis business and has broad-reaching applications in the fields of microscopy, genetic counseling and medicine.

Arjun Raj, PhD

Dr. A.T. Charlie Johnson

Sensor innovation moves forward to development

This past year inventor Dr. A.T. Charlie Johnson, Rebecca W. Bushnell Professor of Physics and Astronomy in the School of Arts & Sciences, received three issued patents:

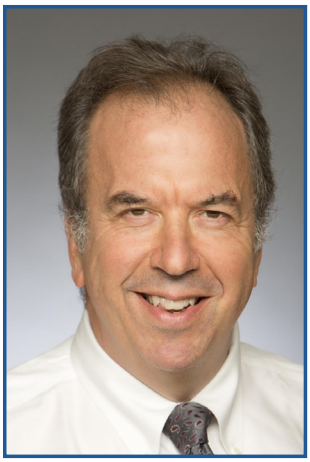
- **US # 10,983,117:** Carbon Nanotube Biosensors and Related Methods;
- **US # 10,900,971:** Biomimetic Chemical Sensors Using Nanoelectronic Readout of Olfactory Receptors; and
- **US # 10,809,222:** Opioid Detection Based on High Quality Graphene Transistor Arrays and a Synthetic Mu Receptor. The technology describes sensors having high sensitivity that are tailored to detect a broad range of molecular components.

705 **Patent applications filed, 84 U.S. patents issued**

Cancer technology leads to a new startup

Jeff Winkler, PhD, the Merriam Professor of Chemistry in the School of Arts & Sciences and Ravi Amaravadi, PhD, Associate Professor of Medicine at Penn Medicine, were named inventors on an issued patent describing novel autophagy inhibitors potentially useful in the treatment of cancer therapy. This patented discovery has been licensed as part of the foundational technology portfolio for Pinpoint Therapeutics, a company focused on developing novel cancer treatments, and is already showing encouraging in vivo results.

Jeff Winkler, PhD



Ravi Amaravadi, PhD

commercializing

Toyota chooses SEAS for multi-institutional $75M AI-focused automotive research alliance

Penn's School of Engineering and Applied Sciences was chosen as one of 16 university participants in a $75 million five-year artificial intelligence research program sponsored by the Toyota Research Institute (TRI). The program is one of the biggest collaborative research programs spearheaded by a major automotive company worldwide, and the joint research effort covers three key AI-related areas: automated robotics, machine-assisted cognition and automated driving. Michael Posa, Ph.D., an assistant professor of mechanical engineering and applied mechanics and Jianbo Shi, Ph.D., a professor in Penn's computer and information science department, both of whom are affiliated with Penn's GRASP Laboratory, will receive research funding through the TRI alliance.

TOYOTA RESEARCH INSTITUTE

School of Veterinary Medicine faculty form a key biotech partnership

Iveric Bio, a biopharmaceutical company focused on the discovery and development of treatments for human retinal diseases, entered into a sponsored research agreement with Drs. Karina Guziewicz and William Beltran, both from the Penn School of Veterinary Medicine to examine the efficacy and toxicity of a novel treatment for inherited retinal diseases (IRDs) associated with mutations of the BESTI gene (i.e., bestrophinopathies), in a preclinical canine model of the disease. It's estimated that in the U.S. and EU combined, there are approximately 10,000 to 40,000 currently suffering from BESTI-related IRDs.

Gyroscope Therapeutics partners with a Penn gene therapy leader, Dr. Jean Bennett

Gyroscope Therapeutics, a British gene therapy company with a presence in Philadelphia, entered into a two-year sponsored research agreement with the Penn Center for Advanced Retinal and Ocular Therapeutics (CAROT) to develop novel gene therapies for serious eye diseases that can lead to permanent vision loss. CAROT is led by Jean Bennett, PhD, whose lab invented and developed the approved gene therapy product marketed by Spark Therapeutics under the brand name Luxturna™ for the treatment of Leber Congenital Amaurosis, an inherited retinal disorder. Under the research collaboration between Penn's CAROT and Gyroscope, the two parties will work together to explore specific gene therapy candidates for the treatment of glaucoma, optic neuritis and retinitis pigmentosa.

GYROSCOPE VISION FOR LIFE

Karina Guziewicz, PhD

William A. Beltran, DVM, PhD

commercializing

Freddie Mac partners with Wharton faculty to understand regulations on housing affordability

Susan Wachter, PhD

Wharton Professor Susan M. Wachter, the Albert Sussman Professor of Real Estate at the Wharton School and a national expert on housing policy and real estate, is working with Freddie Mac to address the nation's worsening crisis of housing affordability, particularly for low to moderate income households. Affordable housing is particularly lacking in cities with rapid job growth and strict land use regulations, as well as impacts due to the coronavirus and racial inequalities in the housing system. To help address this crisis Dr. Wachter and her team will work in close partnership with Freddie Mac to research, develop, maintain and host the National Land Use Regulatory Index to better:

- Detect the impact of regulation on housing costs,
- Identify potential solutions to increase access to affordable housing for all, and
- Connect pro-affordability land use zoning with quality outcomes on the ground.

$310.4M
Annual licensing revenue

746
Executed commercial agreements

AbbVie partners with Penn Chemistry and the Molander Lab

AbbVie Inc., headquartered in Lake Bluff, Illinois, has entered into two separate multi-year Sponsored Research Agreements with the lab of Gary Molander, PhD, Professor of Chemistry in the School of Arts & Sciences.

The Molander lab, with their expertise in photoredox chemistry, is initially investigating the synthesis of complex, strained, bicyclic systems. In the second project, the group will apply these building blocks as cross-coupling partners with various DNA-conjugated substrates.

The goal of this work is focused on the development of DNA-compatible methods to install C(sp3)-rich chemical matter, available for DNA-encoded library production. These libraries are used as vital tools in the academic research and drug development industry to simultaneously screen billions of potentially bio-active compounds.

COVID Innovations

Penn inventors make the mRNA-based COVID vaccines possible

As mRNA-based SARS-CoV-2 vaccines continue to help hundreds of millions of individuals worldwide avoid the worst effects of the deadly global pandemic, Drew Weissman, MD, PhD, the Roberts Family Professor of Vaccine Research, and Katalin Karikó, PhD, an adjunct professor of Neurosurgery at Penn, have been awarded multiple prestigious prizes that recognize their prescient mRNA discoveries that laid the foundation for these vital life-saving products.

These prestigious recent awards include:

- Lasker-DeBakey Clinical Medical Research Award;
- Albany Prize;
- Breakthrough Prize in Life Sciences; and
- both were recently named to the 2022 National Inventors Hall of Fame.

Drew Weissman, MD, PhD, and Katalin Karikó, PhD

Cesar de la Fuente, PhD

Ping Wang, PhD

PCI supports commercialization for two rapid and more accurate at home COVID tests

Cesar de la Fuente, PhD, presidential assistant professor in the Perelman School of Medicine and head of the de le Fuente Lab in the Department of Bioengineering and the Department of Microbiology, and his research team are working on a low-cost biosensor that can specifically identify and diagnose different types of infectious agents in a matter of minutes.

Professor de la Fuente was recently awarded $80,000 through the inaugural Nemirovsky Engineering and Medicine Opportunity prize for his proposal to develop rapid, paper-based COVID-19 breath tests through this evolving technology platform. One particularly compelling product concept based on Dr. de la Fuente's technology approach involves the integration of a miniaturized biosensor directly into face masks to alert a wearer in real-time if the sensor found the virus present in the atmosphere surrounding the wearer.

Ping Wang, PhD, professor of pathology and laboratory medicine in the Perelman School of Medicine, is also seeking to fill the urgent need for rapid and more reliable COVID-19 testing. Wang's lab has developed a rapid antigen test that can detect small loads of SARS-CoV-2 with sensitivity comparable to that of the "gold-standard" PCR (polymerase chain reaction) test.

The technology works in concert with a smartphone camera to photograph and measure the size and number of miniature, gas-filled viral detection bubbles—called microbubbles—in a chemical reaction using patient samples rapidly collected via a nasal swab.

connecting

Passage Bio expands its R&D alliance and exclusive licensing relationship with Penn after its record-setting IPO

Passage Bio, a genetic medicines company co-founded by James A. Wilson, M.D, Ph.D. the Rose H. Weiss Professor in Penn Medicine who leads the Gene Therapy Program (GTP) and Orphan Disease Center at Penn, is developing transformative therapies for the treatment of rare monogenic central nervous system disorders. The company raised a total of $248.4 million through its initial public offering in March 2020, setting a new record for an IPO by a Philadelphia-area cell or gene therapy company.

Passage Bio continues to work closely with Penn and the GTP and recently announced a significant expansion of its current R&D alliance to include an additional five therapeutic product development programs. Under the expanded relationship, Passage Bio will fund additional discovery research to be conducted at Penn and GTP, and will receive exclusive license rights, subject to certain limitations, to technologies resulting from the discovery program for Passage Bio products developed in partnership with Penn.

James M. Wilson, MD, PhD

Saar Gill, MD, PhD

Carisma Therapeutics continues to grow and thrive

Carisma Therapeutics Inc., a biopharmaceutical company focused on discovering and developing innovative immunotherapies based on a CAR-modified macrophage platform technology and co-founded by Penn Medicine's Dr. Saar Gill, closed its Series B equity financing this year bringing the total amount raised in this round to $59 million and Carisma's total capital raised to date up to nearly $121 million.

Dr. Gill is assistant professor of Medicine in the Perelman School of Medicine at the University of Pennsylvania and chair of the company's scientific advisory board.

This Series B round included follow-on funding from founding investors, IP Group, Inc. and Penn Medicine, as well as an investment from new investor 4BIO Capital. They joined the initial Series B investor syndicate of SymBiosis II, Solasta Ventures, Livzon Pharmaceuticals Group, AbbVie Ventures, HealthCap, Wellington Partners, TPG Biotech, Agent Capital and MRL Ventures Fund.

Carisma has an ongoing research partnership with Penn, funding research programs in the Gill laboratory and a phase I clinical trial of Carisma's lead product CT-0508, which recently was granted Fast Track Designation by the FDA.

$130.4M

Received for industry Sponsored Research Agreements

connecting

Cabaletta Bio expands Penn partnership

Cabaletta Bio, a clinical-stage biotechnology company focused on engineered T cell therapies for B-cell mediated autoimmune diseases, further expanded its ongoing sponsored research agreement with Penn this year to include three additional B cell-mediated autoimmune disease targets.

The research is being conducted under the direction of Aimee Payne, PhD, associate professor of dermatology in Penn's Perelman School of Medicine and director of the Penn Autoimmunity Center of Excellence, who co-founded the company along with Michael Milone, Associate Professor of Pathology and Laboratory Medicine at the Hospital of the University of Pennsylvania.

Aimee S. Payne, MD, PhD

Michael C. Milone, MD, PhD

31 **Programs and educational events**

PCI programming goes virtual

Throughout FY21, the PCI full suite of programming activities, ranging from I-Corps engagement and Fellow's training through to our various speaker series and related events, were hosted entirely online. The ongoing public health crisis did not however restrain PCI's efforts to regularly engage the university community and external partners with the latest advice and programmatic support for commercialization and technology transfer. An unanticipated benefit of going 100% virtual was that all webinars were recorded and are now available for watching at: **youtube.com/c/PennCenterforInnovationPhiladelphia**

PCI's Managing Director leads panel discussion on Cellicon Valley with Penn Medicine faculty luminaries

On May 6 and 7, leaders from Penn and the international CAR-T medical community came together to discuss the new standards of patient care and strategies to optimize and improve CAR T cell therapies. John Swartley, PCI's managing director, hosted a panel discussion on the commercialization of CAR-T technology and how these vital technologies and therapeutic treatments are being brought to the marketplace.

Press Highlights of FY21

PCI posted 175 articles on its website covering topics from Penn innovation, local startups, the Philadelphia innovation ecosystem, and investment trends. The most popular and widely circulated stories included:

- Penn in the top 5 of all categories in university venture funding rankings
- Philadelphia Magazine shines a spotlight on two Penn spinouts
- Penn startups and inventors featured at MedCity INVEST Precision Medicine Conference

connecting

The 5th annual Celebration of Innovation honored more than 80 Penn inventors, startups, and partners

The Penn Center for Innovation hosted the fifth annual Celebration of Innovation on Tuesday, December 2nd, 2020. More than 130 people were in attendance, virtually, to hear from Keynote Speaker Dr. Jonathan A. Epstein, M.D., Executive Vice Dean and Chief Scientific Officer, Perelman School of Medicine, and discover the names of the 5 special award winners.

Hyun (Michel) Koo, DDS, MS, PhD

Despite not being able to be in person at our usual happy hour and talk, the event was still intimate and focused on the successful innovations emerging from Penn. Dr. Epstein spoke on how Penn Medicine researchers pivoted their work to tackle COVID, from vaccine development, to patient care and diagnostic testing. Researchers including Dr. Drew Weissman, Dr. Cesar de la Fuente, Dr. James Wilson, and Dr. Ping Wang, are all leveraging their work to help in the critical public health fight.

Jonathan A. Epstein, MD

126 **Press mentions for PCI programs, Penn spinouts and partners**

Following Dr. Epstein's talk, the annual awards were presented. In honor of a true innovation champion at Penn, the Partner of the Year Award was renamed for Paul D. Sehnert. Paul was the director of real estate development at Penn who helped bring the Pennovation Works campus to fruition. He lost his battle with cancer last year. The award winners in the order they were received are:

- **Deal of the Year:** Exyn Technologies in recognition of its groundbreaking partnership with Sandvik
- **Emerging Inventor of the Year:** Dr. Michel Koo of Penn Dental in recognition of his groundbreaking work developing novel approaches to eradicate biofilms
- **Startup of the Year:** Cabaletta Bio
- **Inventor of the Year:** Dr. Saar Gill of Penn Medicine in recognition of extraordinary innovations allowing expansion of cell therapy to new cell types, new indications and new methods of gene delivery
- **Paul. D. Sehnert Memorial Partner of the Year Award:** Pennovation Works

accelerating

Interius Therapeutics raises record-breaking Series A round

Interius Therapeutics, a two-year-old Philadelphia gene therapy company spun out of Penn, raised a $76 million Series A in what is believed to be the largest private stock sale by a local life sciences company during the last fiscal year. Interius Biotherapeutics was co-founded by Penn Medicine's Saar Gill, PhD, assistant professor of Medicine at the Hospital of the University of Pennsylvania, and longtime life sciences industry entrepreneur Bruce Peacock, a former executive at local companies including Centocor, Orthovita, and Adolor.

The oversubscribed Series A equity financing round was co-led by new investors Boston-based Cormorant Asset Management and Fairmount Funds out of Philadelphia. Other new investors included Bain Capital Life Sciences, Pfizer Ventures, RA Capital Management, Longwood Fund, Logos Capital, Osage University Partners and Quan Capital. In addition to the new syndicate members, Interius's existing investors — Tellus BioVentures, the University of Pennsylvania and Penn Medicine, Agent Capital, the Mark Foundation for Cancer Research, Knollwood, and BrightEdge, the American Cancer Society's impact investment fund — all participated in the round as well.

Gene therapy pioneer invents new therapy to improve delivery of gene therapies to treat ocular diseases

Jean Bennett, MD, PhD, F.M. Kirby Professor of Ophthalmology at Penn Medicine, is listed as lead inventor on an issued patent that describes mRNA trans-splicing as a gene therapy for treatment of ocular diseases caused by defects in large genes. The technology offers the ability to use smaller constructs to replace only a portion of a target gene, overcoming prior challenges caused by the transgene packaging limits of standard AAV-based gene therapy vectors. This technology has been licensed to Ascidian Therapeutics (formerly Limelight Bio).

$816.2M

In venture capital received or raised by Penn-affiliated startups

INTERIUS

Verismo THERAPEUTICS

Verismo launches with CAR-T expert co-founders

Verismo, a new cell therapy company pioneering multi-chain CAR-T technology, raised $16 million in equity financing. The company was co-founded by some of the same Penn Medicine scientists who helped to create and develop Kymriah, the first CAR-T product approved by the FDA. Penn Medicine faculty members Michael Milone, PhD, from Penn's Center for Cellular Immunotherapy and Donald Siegel, PhD, director of the division of transfusion medicine and therapeutic pathology, re-purposed the CAR-T technology platform to create what Verismo now calls KIR-CAR, to potentially treat solid tumors. Penn Medicine's CAR-T pioneer Dr. Carl June is also a founding advisor to the company.

Jean BennettMD, PhD

accelerating

Vivodyne pioneers bioengineering tools

Vivodyne, a biopharma startup co-founded by Penn Engineering Associate Professor of Bioengineering Dan Huh and Bioengineering PhD candidate Andrei Georgescu, launched earlier this year and successfully raised $5M in seed capital from Kairos Ventures.

Vivodyne is further developing a platform technology that allows thousands of individually lab-grown, living pieces of human organs to be cultivated at the same time. By testing drugs and life-saving biologics directly on these realistic human tissues for safety and effectiveness at an unprecedented scale and resolution, the company believes they can greatly improve the success rates of therapeutics entering clinical trials.

Leading Universities launch Joint Technology Licensing Program

Penn is one of fifteen of the country's leading research universities—Brown, Caltech, Columbia, Cornell, Harvard, the University of Illinois, Michigan, Northwestern, Princeton, SUNY Binghamton, UC Berkeley, UCLA, the University of Southern California, and Yale— that launched the University Technology Licensing Program (UTLP).

UTLP brings a subset of intellectual property assets from within these universities' patent portfolios related to the physical sciences together for efficient licensing, enabling interested tech companies to obtain licenses to inventions from multiple universities for their existing and future product offerings. By providing a one-stop shop for companies to access technologies of interest, UTLP is designed to accelerate the pace of innovation in the industrial arena.

Multiple technology areas are included in the University Technology Licensing Program, including connectivity (e.g., power management, networking protocols, signal processing and codecs, location tracking, cameras and image processing); autonomous vehicles; and data applications (e.g., storage, data management, network protocols). Visit the website at **utlp.net**

Neuralert achieves a key milestone

Neuralert, co-founded by Professor Steven Messé, MD from Penn Medicine's Department of Neurology and Research Assistant Professor James Weimer, PhD from Penn Engineering's Department of Computer and Information Science, is developing a novel approach that addresses the problem of late or undetected stroke in hospitalized patients. The system uses non-invasive, wearable devices which continuously monitor at-risk hospitalized patients for stroke symptoms and automatically alerts clinical staff resulting in more rapid assessment and treatment of the patient.

The Center for Devices and Radiological Health (CDRH) of the Food and Drug Administration (FDA) granted the Neuralert Monitor designation as a Breakthrough Device.

Neuralert's technology

21 **PCI-facilitated Penn spinouts**

UTLP
University Technology Licensing Program

accelerating

New engineering research center launches with PCI support

Penn Engineering's NSF-backed Engineering Research Center for precision agriculture (the IoT4Ag) was formally launched in September of 2020 and is being actively supported by PCI's Corporate Outreach team through its spearheading of the Innovation Ecosystem function for the multi-institutional alliance.

In the Center's first year, the team successfully recruited and signed up eighteen private sector members who share the Center's vision of achieving sustainable, environmentally-safe and energy-conscious food security through innovative technology. – including start-ups, investment firms, mature companies, and non-profits – for the Center's industrial participant advisory board. Board members provide valuable input and collaborate in commercializing developed IP.

Cherie Kagan, PhD

Tachi Yamada, M.D.

James M. Wilson, PhD

G2Bio launches with $200M to invest in research and development of novel gene therapies

The G2 Bio Accelerator, co-founded by James M. Wilson, MD, PhD, Director, Gene Therapy Program, Rose H. Weiss Professor and Director, Orphan Disease Center and Professor of Medicine and Pediatrics, and the late Tachi Yamada, launched with a $200 million investment commitment from the global investment firm Temasek to accelerate the development of genetic-based therapies.

G2 Bio will fund and develop potential next-generation gene therapy candidates emerging from research conducted at Penn's Gene Therapy Program (GTP). GTP's broad research program is working to develop novel therapeutics against more than 50 different disease programs and is currently managing dozens of translational research projects using a variety of cutting-edge technologies, including gene therapy, gene editing, and mRNA therapeutic approaches using adeno-associated viruses or lipid nanoparticles.

Dr. Wilson's laboratory has made seminal contributions to the field of gene therapy which has paved the way for translation of many of these technologies into the clinic and through to product approval. Dr. Wilson has published over 600 papers, is named on over 200 patents worldwide and is co-founder of more than half a dozen promising biotechnology companies.

Penn I-Corps

Penn I-Corps, launched in 2015, is an early-stage accelerator funded by the National Science Foundation (NSF) and managed by PCI. As a result of the program's longstanding success, Penn was recently chosen to participate as a founding member of the National Science Foundation's new innovative I-Corps Hub initiative which forms the new operational backbone of the Innovation Network of NSF.

PENN I-CORPS
educate. collaborate. accelerate.

I-Corps in FY21
Twelve teams participated in the Fall 2020 cohort and ten in Spring 2021. Both cohorts were offered virtually, enabling the refinement of innovative techniques for online teaching. A wide range of technology types was represented, including artificial intelligence, diagnostics, drug development, information technology, materials, energy, medical devices, and therapeutics. The innovations solve problems in various domains, such as cardiovascular medicine, OB-GYN, pediatric care, mental health, energy efficiency, education, and women's health. A recurring theme is applying artificial intelligence to areas as diverse as accessibility, finance, human resources, drug discovery, and education.

Penn I-Corps History
Since its inception, Penn I-Corps has trained 148 teams and 312 individuals. Seven teams have participated in the National I-Corps program, and eight teams have subsequently been awarded SBIR/STTR grants. To date, 6 I-Corps company graduates have reached the stage of generating revenue, and 37 have cumulatively received $31 million in external funding support from various sources, including professional VC investors. Overall, 104 jobs have been created by program graduates, and three companies received the President's Innovation Prize.

- UroGenie (Spring 2020) – a novel hardware/software solution company to measuring urinary flow in both the office and home, with wireless data upload into the EMR for increased workflow efficiency and searchable data. The company was also recently awarded an SBIR stage II grant.Infini Fluidics (Fall 2020) received an NSF Phase I SBIR award
- Infini Fluidics (Fall 2020) – a company developing a microfluidic platform that satisfies manufacturing needs of injectable drug particles from lab scale to commercial scale that recently received an NSF Phase I SBIR award.
- Neuroflow (Fall 2016) – a company providing leading solutions for population health, behavioral health integration, and collaborative psychiatric care that was recognized with the 2021 PACT Enterprise Awards as a Healthcare Innovator.
- Percepta (Fall 2019) – a company developing technology to detect shoplifting in retail stores in real-time to catch incidents that loss prevention personnel often miss. The company was recognized by Technical.ly Philly among Philly's young tech companies to watch this year.
- Quantaras (Spring 2018) – is developing its Automatic Anatomy Recognition software (AAR) to reduce the time needed for recognition, delineation, and identification of anatomical objects and diseased tissue to 15 minutes on MRI, CT, and PET/CT imaging. The company recently received critical 510(k) clearance for automatic anatomy recognition for radiation therapy. Formerly named QRS.

accelerating

2020 Pennovation Accelerator Names Two Winners: Headway and SOLUtion Medical

On July 16, 2020, the Pennovation Accelerator held their virtual Pitch Day, the culminating event for the six-week program focused on the makings of a strong pitch. Each of the ten cohort companies gave an impressive 5-minute pitch to a virtual audience of more than 80 people, followed by questions from a panel of judges:

- Dr. Brandi Baldwin, Founder and CEO of Millennial Ventures Holdings
- Holly Flanagan, Managing Director at Gabriel Investments
- Rick Genzer, Investment Director at Ben Franklin Technology Partners

At the conclusion of the ten pitches, the judges and the Pennovation Accelerator review committee deliberated to award two winners:

70+ **Companies and growing at the Pennovation Works campus**

Overall Winner: Headway
Headway is the overall 2020 Pennovation Accelerator Winner, based on engagement in the program, growth over the six weeks, and their final pitch. Headway takes home the $5,000 cash prize, along with 6 months of membership and an accounting startup package sponsored by PCI Ventures' partner, Stephano Slack.

Headway is improving surgical team communication in Minimally Invasive Surgery (MIS) with a hands-free pointer device for surgical monitors in the OR. Julia Lin, Co-Founder & CEO, gave their pitch. She is joined by co-founders Laura Ceccacci, Jonah Arnheim, and Alex Qian Wan. All four are 2020 graduates of the University of Pennsylvania's Integrated Product Design masters program.

Best Pitch of the Day: SOLUtion Medical
This includes 6 months of membership to the Pennovation Center and the Stephano Slack accounting startup package

SOLUtion

PENNOVATION WORKS

accelerating

Strella Biotechnology grows out of Pennovation Center and signs lease for expanded lab space in the new Pennovation Lab

Penn's Division of Facilities and Real Estate Services newest Pennovation Lab tenant, Strella Biotechnology, will be occupying an approximately 2,000 SF lab in the building, expanding its agricultural innovation within the Pennovation Works ecosystem. The Lab is designed for companies that have secured early-stage funding and have outgrown their incubator space, and with this lease, nearly one third of the building is already under agreement.

Strella Biotechnology is a Philadelphia-based agricultural biotech startup, founded by Penn graduates, looking to solve the global problem of food waste, through data-driven technology designed to ensure fruit quality throughout every segment of the supply chain by predicting the shelf life of food. They participated in the Penn I-Corps program , and then went on to win the 2019 President's Innovation Prize. In less than two years, Strella has grown from a lab bench and office in the Pennovation Center to their own lab. The company has raised $3.3 million in its seed funding to-date, led by California-based venture capital firm Yamaha Motor Ventures & Laboratory Silicon Valley, Catapult Ventures, Union Labs, Red & Blue Ventures, and entrepreneur Mark Cuban. Strella has won several awards including "The Pitch" podcast event at Penn, VentureWell E-Team grants, a $100,000 award in Arizona State University's Innovation Open competition, as well as a National Science Foundation grant and the company is planning to raise a Series A round this winter.

Philadelphia's newest multi-tenant lab and office space, Pennovation Lab is now available for occupancy. Developed by the MRA Group on behalf of Penn, the new facility boasts 65,000 square feet of scientifically-advanced wet and dry labs and office space, attracting tenants with its highly desirable location adjacent to the University and positioned in the heart of the Pennovation Works campus. At Pennovation Lab, tenants can combine 2,000 sq-ft modules to customize their own unique suite, up to approximately 12,000 sq ft.

Pennovation Lab

Advanced features in the base building, such as a high efficiency air handling system, backup power, and modular layout, enable delivery of the labs quickly and cost-effectively. In addition, a dedicated lab fit-out team has been assembled to meet the needs of each tenant every step of the way, regardless of their stage of growth or real estate experience.

As a Pennovation Lab tenant, Strella Biotechnology has access to building amenities, which include a two-story lobby with a seating area; dedicated lounge space complete with a kitchenette, and a glass wash and autoclave facility. Additionally, Lab tenants have access to Pennovation Plaza, Cafe, and Pennovation Works events and services, as part of this community 'where ideas go to work'.

accelerating

Philly Tech Week: Innovation Lessons from the Frontiers of Healthcare

This panel discussion, held virtually, as part of Philly Tech Week, brought together some of the most pioneering startups and researchers from the University of Pennsylvania and Pennovation Works ecosystems.

The conversation covered their approaches to healthcare innovation over the past year, lessons learned during challenging times, and their business plans for the future. They each highlighted the power of community and importance of collaborations with fellow entrepreneurs, researchers, mentors, financers, and contacts from the Penn Center For Innovation, the Pennovation Works ecosystem, and around the University. The dialogue was moderated by Laurie Actman, Chief Marketing Officer at PCI and panelists included:

- Cynthia M Otto, DVM, PhD, Director, Penn Vet Working Dog Center
- Eric Corkhill, CEO, Neuralert
- Jessica DesNoyer, CEO, Ostiio
- Eshwar Inapuri, CEO and Co-founder, InnaMed
- Anthony Scarpone-Lambert, founder of Lumify Care

50+ **Meetings with corporations and exernal partners**

PCI and Pennovation Center sponsor Philly Tech Week and PACT Capital Conference

As part of Philly Tech Week 2021, PCI and PACT hosted a pitch event featuring six of the most innovative startups emerging from Penn. As part of this Emerging Startup Showcase, Barbara Schilberg of BioAdvance, Emily Foote of Osage Venture Partners and Margalit Haber of Osage University Partners provided on-the-spot feedback to presenting companies.

The 2020 PACT Capital Conference brings together key leaders from private equity, venture capital, universities, and the entrepreneurial community. Penn had 11 companies represented including PCI Ventures UPstart companies, Pennovation tenants, and participants in the JPOD.

PCI VENTURES Updated Flagship Programs announced

PCI Ventures updated its flagship programs this past year that support University startups.

The Upstart program, which offers a wide array of services to assist entrepreneurial faculty members with the company formation and development process, now allows company founders to have a limited amount of anti-dilution protection while the company assembles its management team. Penn will take most of the dilution from bringing team members aboard; allowing the founders to stay as close as possible to the Patent Policy limit of 49.9% ownership.

The UPadvisors program which is designed for a team that needs less ongoing support, now allows companies to start as wholly owned by the founders with Penn receiving a deferred equity agreement (SAFE) for the PCIV services provided under the program. (Note: the Company will still need to conform to the university Patent Policy).