Value Creation and Partnerships in Innovation Ecosystems: Translation Validation, Entrepreneurship and Commercialization

Sponsored by National Science Foundation ART (Accelerating Research Translation) Program at NJIT and National Academy of Inventor (NAI) – NJIT Chapter

July 13-14, 2026 | 8:00 AM – 5:00 PM
Atrium, Campus Center

NJIT | Center for Translational Research
New Jersey Institute of Technology

NJIT New Jersey Institute of Technology
Chapter of the National Academy of Inventors

Announcement:
CTR 2026 Translational Research and Innovation Badge Workshop

Value Creation and Partnerships in Innovation Ecosystems: Translation Validation, Entrepreneurship and Commercialization

Sponsored by
NSF ART (Accelerating Research Translation) Program at NJIT
National Academy of Inventor (NAI) – NJIT Chapter

Date and Venue: July 13-14, 2026, Atrium, Student Campus Center, NJIT
(Breakfast and Lunch will be provided on both days.)

Faculty, Post-docs and Students are Welcome

For Full Program and Addition Information – Click Here

Attendees of the CTR Workshop will receive "Completion Trophy and NJIT Digital Badge Certificate with Professional Development Hours (PDH) Credits after competition.

Registration Required

Please Register using CTR Translational Research Badge Workshop Registration Form

NJIT Digital Badge & (PDH) Credit

Participants who attend the CTR 2026 Translational Research and Innovation Badge Workshop Value Creation and Partnerships in Innovation Ecosystems: Translation Validation, Entrepreneurship and Commercialization will earn **6 Professional Development Hours (PDHs)** per day through the issuance of a digital badge, a credential issued by NJIT via Parchment Badges.

NJIT digital badges are **verifiable, shareable credentials** that recognize learning, achievements, skills, and competencies gained through NJIT experiences. This digital badge represents a one-time achievement and confirms the 6 PDHs earned per day.

Accessing and Using Your Badge

Once earned, your badge will be sent to the email used for registration. First-time recipients will need to create an account using that same email address. After setup, badges can be accessed through your Parchment Backpack, where you can:

- Access all earned badges from your Backpack at any time
- Share your badge on LinkedIn and other platforms
- Include it in resumes, portfolios, and applications
- Showcase your skills, achievements, and professional development

Each badge includes detailed metadata outlining the issuer, criteria, date earned, and associated skills.

For questions regarding NJIT digital badges, please contact: LDIHelp@njit.edu

Scan to Learn More About NJIT Digital Badges

Day 1
https://njit.badges.parchment.com/public/badges/S-ZkchQ8RoSO4nNwXhQs0g

Day 2
https://njit.badges.parchment.com/public/badges/1jCuRf0DRk-qvvB-gosDsQ

Happy learning and earning!

Brief Description: The Center for Translational Research is committed to promoting excellence in collaborative research, innovation partnerships, entrepreneurial pathways, education, training and infrastructure development to translate technology into applications with a high societal and economic impact. To follow up on the CTR mission to enhance the research, innovation and technology entrepreneurship ecosystem at NJIT, we have initiated a series of CTR workshops on Intellectual Property and Tech Transfer in Translational Research for Value Creation to enhance our understanding and facilitate pathways to innovation partnerships and value creation. The CTR badge work will provide faculty, postdocs and students an opportunity to interact with experts on early and advanced translational research, tech transfer, licensing and creating partnerships-based start-ups for entrepreneurial and commercialization activities.

Why You Should Attend: The CTR workshop agenda will bring key stakeholder groups including academic innovators, industry, government and community leaders to focus on understanding their perspectives and expectations on developing and sustaining partnerships-based value creation roadmap for technology translation from lab to market.

The workshop will provide a unique forum of "Reverse Pitch Presentations" from successful entrepreneurs to learn about innovation translation and value creation for commercialization (please see the session protocol details with interactive participation of faculty and students in the agenda below). The start-up industry presentations will be followed by open discussion on understanding the importance of value based effective communication to stakeholders for securing investment funding.

Also, an experienced professional team from VentureWell will present a special interactive workshop session to understand various funder perspectives and alignment with business stage of startups, and investor perspectives and elements of a successful value proposition. Throughout the workshop, attendees will have opportunities to learn and discuss challenges and pathways to innovation translation and validation towards potential commercialization for societal benefits and economic impact.

Who Should Attend: Faculty, research staff, undergraduate and graduate students and postdocs and external partners who are pursuing or are interested in understanding pathways to translational research and innovation partnerships-based value creation for technology translation to use-inspired applications and societal impact should attend and would be benefited from the badge workshop.

The CTR badge workshop is required to all innovators and principal investigators funded by CTR translational research seed grants including TITA and CERT seed grants. Faculty who are planning to submit TITA or CERT seed grant proposals should attend as they will have the opportunity to network with TITA external advisory board members and learn value creation and investment presentation tactics from successful entrepreneurs.

Program

Day-1: July 13, 2026

9.00 AM – 9.15 AM: Welcome Remarks
Atam Dhawan Chief Strategic Innovation Officer, NJIT
Teik Lim, President NJIT

9.15 AM – 10.00 AM: Distinguished Keynote
Krishna Juluru, MD, FDA Digital Health Center of Excellence alum; White House Presidential Innovation Fellow alum; Adjunct Professor, University of Pennsylvania; Physician Scientist

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Keynote Address "From Lab to Market to Lesson: The Total Product Lifecycle of a Healthcare Innovation"

Great science is necessary. It is not sufficient.

This keynote traces the complete journey of a healthcare product, from the first spark of a clinical insight through concept, design, testing, regulatory approval, workflow integration, reimbursement, post-market surveillance, and iterative change, using Pear Therapeutics as a real-world guide. Pear earned FDA authorization for the world's first prescription digital therapeutic, built a compelling clinical evidence base, and still filed for bankruptcy in 2023. Their story illuminates what it takes to navigate not just the science, but the full commercial and regulatory ecosystem of modern healthcare innovation.

A central framework of the talk distinguishes three evidence standards that every healthcare innovator must satisfy: the FDA's standard of *safe and effective*; the payer standard of *reasonable and necessary*; and the clinical adoption standard of *ease of use*. Each demands different data. Each requires a different strategy. And failing any one of them, no matter how well you've answered the others, can prevent a genuinely effective innovation from reaching patients.

10.00 AM – 12.00 PM: Technology Innovation Translation Acceleration (TITA) Seed Grant Progress Report Presentations

Session Description: This session will feature Technology Innovation Translation Acceleration (TITA) seed grant project progress report presentations from the TITA-2026 and TITA-2025 cohorts. Presentations will include technology innovation, translational research, application and market validation, accomplishments and roadmaps to address future challenges.

10.00 AM – 10.10 AM: Introductions and Overview: Atam Dhawan

10.10 AM – 11.40 AM: Cohort: TITA 2026

1. Arjun Venkatesan, Associate Professor, Civil and Environmental Engineering
   Chemical Defluorination of PFAS Under Ambient Conditions

2. Somenath Mitra, Distinguished Professor, Chemistry and Environmental Science
   n-Fast - A Nanotechnology Approach to Developing Fast Dissolving Active Pharmaceutical Ingredients (APIs) (including TITA-2025 award)

3. Murat Guvendiren, Associate Professor, Chemical and Materials Engineering
   Settable Bone Allograft Matrix Formulations

4. Hai Phan, Associate Professor, Data Science
   NoirVPAI: The World's First Private and Secure AI Router

5. Lin Dong, Assistant Professor, Mechanical and Industrial Engineering
   Skin-Like Cardiac Patch for Personalized and Preventive Heart Care

11.40 AM – 12.00 PM: Cohort: TITA 2025

6. Eon Soo Lee, Professor, Mechanical and Industrial Engineering
   Functional Nano-carbon Enhanced Phase Change Materials (PCMs) for Improved Thermal Properties, and Long-term Durability

7. Hao Chen, Professor, Chemistry and Environmental Science
   Rapid Detection of Per- and Polyfluoroalkyl Substances (PFAS) Using Paper Spray-Based Mass Spectrometry

8. Lin Dong, Assistant Professor, Mechanical and Industrial Engineering
   Revolutionizing Cardiac Care with Heart Energy

12.00 PM – 1.00 PM: Lunch and Networking

1.00 PM – 2.00 PM: Distinguished Panel Discussion: Building Innovation Ecosystem for Translational Validation, Entrepreneurship and Commercialization

Session Description: This session will feature value creation and sustainability with respect to securing resources and investment funding for successful technology innovation translation and validation towards entrepreneurship and commercialization. The panel will also discuss how the innovation ecosystems with stakeholder partnerships can be developed and sustained to support translational research, validation and commercialization for societal benefits and economic impact.

Susan J. Schofer, Ph.D., Partner, SOSV / HAX, Chief Science Officer, HAX
Paul A. Sohl, Rear Adm. USN (ret), CEO, Florida High Tech Corridor
Marc Long, Chief Scientific Officer & Executive Vice President, Research & Development, Clinical & Medical Affairs, MTF Biologics
Govi Rao, Chief Executive Officer, Phase Change Solutions

2.00 PM – 3.30 PM: CTR-TITA Advisory Board Meeting

3.30 PM – 4.30 PM: CERT-2025 Seed Grant Projects Showcase and Networking

Session Description: This session will feature Collaborative Early Research Translation (CERT) seed grant project progress report showcase presentations from the CERT-2025 cohort. Presentations will include technology innovation, translational research, application and market validation, accomplishments and roadmaps to address future challenges.

Farid Alisafaei (NCE): DermaMech: Kirigami-Inspired Skin Grafts that Enhance Graft Success and Reduce Donor Site Morbidity

Rayan Hassane Assaad (NCE): An Intelligent Unmanned Aerial Vehicle (UAV) Drone Robotic System Featuring Dynamic Sensor Reorientation Apparatus, Multimodal Sensor Fusion, and Artificial Intelligence (AI) for Smart and Automated Infrastructure Asset Management

Xiaobo Li (NCE): Toward the Development of an Interactive Virtual Environment for Motor Activity Deficits Assessment and Rehabilitation in Children with ADHD

Sara Casado Zapico (CSLA): Bonepihist: new biomarkers for osteoporosis prediction and prognosis

Jae-Hyuck Park & Jim Shi (MTSM): AgriTech in the era of AI: Vertical Farming Innovation and Implications

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Day-2: July 14, 2026

9.00 AM – 9.15 AM: Welcome Remarks and Recap Day-1 Workshop

9.15 AM – 9.30 AM: Framework of the Reverse-Pitch Session and Introductions

9.30 AM – 12.30 AM: Learning Pathways from Innovation Ideation to Impact with Investment Funding

9.30 AM – 10.15 AM: Reverse Pitch Presentations (From Entrepreneurs to Faculty/Academic Innovators Playing as Investors)
Moderator: Atam Dhawan

Presenter Companies:
PFASolve, Inc. - Charmi Chande, CEO
Pure Trace Labs – Cassie Hallberg, CEO
Materium Technologies - Sheldon Fereira, Co-Founder
OppyAI – Hai Phan, Founder & CEO

Session Description: This session is designed for faculty and students to enhance their understanding of investment funding to support technology innovation translational research, application and market validation towards commercialization. The session will follow the following protocol.

1. Faculty and students play the role of investors in small teams. They are asked to make virtual investment in the pitch presenting companies. They are

assigned $1 million virtual money. They can make minimum $500K or maximum $1 million to any company based on the business case, societal impact, ROI and associated risk assessment.

2. Four companies will make 6-7 minutes pitch presentations each asking for $1 million investment to offer a deal on ROI to faculty/student investor teams.

3. After the podium pitch presentations, each company presenter team will sit on a table and faculty/student investor teams will talk to the company pitch presenter team for 10 minutes each to negotiate prospective deals.

4. After the rounds in (2) and (3), each faculty/student team will discuss their respective investments and then each team leader will present their team decision with justification and reasons for their investment(s).

10.15 AM – 11.30 AM: Faculty Investor Team Discussion with Pitch Presenters

11.30 AM – 12.00 PM: Faculty Investor Teams Presentations on the Investment Choices with Assessment and Justification

12.00 PM – 12.30 PM: Open Discussion: Virtual Investment Allocations: Development of Value Proposition Benchmarking Evaluations from Experienced Investors and Entrepreneurs with Guest Investors and Venture Well Team

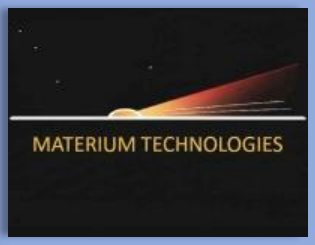
Company Information:

PFASolve, Inc. is developing a comprehensive suite of technologies to tackle the "forever chemical" crisis. By combining field-ready, rapid detection tools with high-efficiency capture and destruction methods, our platform empowers water utilities and environmental partners to monitor, manage, and remediate PFAS contamination faster and more cost-effectively.

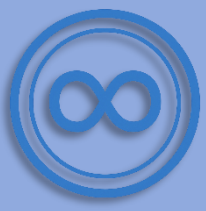
Pure Trace Labs

At PureTrace, we believe everyone deserves clean water and soil. Our mission is to expand access to environmental health information by removing the cost, time, and technical barriers that prevent widespread PFAS testing today.
PureTrace Labs is commercializing a rapid PFAS ("forever chemicals") testing platform that delivers parts-per-trillion (ppt) sensitivity with results in days rather than weeks for under $150. Using Paper Spray Mass Spectrometry (PS-MS) and Desalting Paper Spray Mass Spectrometry (DPS-MS), our

technology—invented by Dr. Hao Chen at NJIT—makes PFAS testing faster, more affordable, and more accessible. We aim to empower homeowners, environmental professionals, and communities to identify contamination earlier, make informed decisions, and reduce exposure to PFAS. PureTrace Labs is an NJII Venture Studio portfolio company and a member of the 2026 CleanTech Open Northeast cohort.



Materium Technologies Inc. is an advanced materials company developing high-performance protective coatings for highly reliable electronics. Using a patented nanocomposite technology developed at Lawrence Berkeley National Laboratory, our thin coatings self-assemble into hundreds of ordered nanosheets in a single wet-coating step without vacuum deposition. They deliver conformal dielectric and corrosion protection, tunable optical and thermal properties, and are designed to help electronics manufacturers and OEMs improve reliability, reduce coating cost and complexity, and support reworkable and recyclable manufacturing across microelectronics, semiconductor packaging, photonics, power electronics, and advanced energy storage.



OppyAI is the World's First Secure LLM Cloud Provider whose mission is to make advanced LLMs usable without exposing sensitive enterprise data, IP, or regulated workflows. Its vision is to become the global standard secure AI inference layer for enterprises, organizations, governments, and individuals across sectors. The company is currently in transition to commercialization, serving its Neural Crypto technology to several large US and international corporations through paid POCs and partnerships.

12.30 PM – 1.00 PM: Lunch and Networking

1.00 PM – 3.30 PM: Distinguished Workshop - VentureWell Team
Value Creation and Sustaining Partnerships in Innovation Ecosystem for Translational Validation, Entrepreneurship and Commercialization

Session Description: Please see the next section for detailed agenda and session description.

3.30 PM – 4.00 PM: Closing Remarks – Innovation Ecosystems at NJIT: Future Directions and CTR Badge Workshop Certificate Ceremony
CTR-TITA Board Members and Venture Well Team

Detailed Agenda

Distinguished Workshop: Value Creation and Sustaining Partnerships with Investors for Entrepreneurship and Commercialization; 1.00 PM – 3.30 PM

Developed in Partnership with VentureWell

Supported by NSF ART Award 2331429 — Enhancements at NJIT to Transform Translational Impact

Target Audience: NJIT faculty, program directors, research center leads, and staff engaged in or seeking external partnerships with industry, government, nonprofits, or community organizations

Learning Objectives:

1. To understand various funder perspectives and alignment with business stage of startups
2. To understand investor perspectives and elements of a successful value proposition

Workshop Design:

This 2.5-hour in-person workshop includes a structured presentation, a fireside chat with investors, and a group activity on developing an investor-ready value proposition.

- **Welcome remarks from NJIT (10 minutes)**

- **Understanding various funder perspectives (30 minutes):** VentureWell staff will lead a structured presentation covering VentureWell's experience in supporting startup founders to secure follow-on funding. It will provide examples and insights related to various sources of funding (government, foundations, institutions, and angel investors), different types of funding (non-dilutive/dilutive), and different sources of equity. The presentation will also include resources on pitching to investors and stages of venture development, as well as guidance about what investors are looking for in early-stage start-ups.

- **Investor Fireside Chat and Q&A (45 minutes):** Through a fireside chat between a VentureWell staff member and an investor, workshop attendees will gain a sense of what success looks like and what they can expect in their own journey. Sourcing questions from attendees through a pre-workshop survey, VentureWell and the investor will speak candidly about what they look for in a pitch, how they evaluate founders and teams, and what most entrepreneurs get wrong when approaching them. The fireside chat will include a discussion about the investment process from the investor perspective,

including first contact, due diligence, and close, so attendees can visualize the full range of engagement, not just the pitch moment. It will also include discussion about what investors are looking for and common mistakes early-stage founders make when approaching investors. The 30-minute discussion will be followed by a 15-minute Q&A session.

● **Break to organize the group activity (10 minutes)**

● **Group Activity (40 minutes):** Participants will be organized into small interdisciplinary groups (3-5) and will be asked to identify a research project that is investor ready and develop a value proposition for it. Based on pre-workshop survey responses, if participants are not able to identify a project, a project relevant to common NJIT research areas will be shared with them. During this exercise, participants will use a structured template to frame the problem, propose a solution narrative, identify the market opportunity, business model, and team, and make the ask. The pitch drafts will be discussed within their groups or shared with the full room.

● **Reflection Exercise (10 minutes):** In this closing exercise, participants will take 10 minutes to individually reflect on the insights gained from the presentation, fireside chat, and group activity, capturing their most important takeaways in writing. Each participant will identify one concrete action they can take within the next 60 days to move their innovation closer to investor readiness: whether that is refining their value proposition, researching a funding pathway, or requesting a warm introduction through their network. Participants will also note one question or gap that remains unresolved and that they commit to addressing before the next CTR engagement opportunity.

Showcase Exhibitors

Table #	Title of the Technology	Proposers	Grant Type
1	Chemical Defluorination of PFAS Under Ambient Conditions	Arjun Venkatesan	TITA-2026 Seed Grants
2	n-Fast - A Nanotechnology Approach to Developing Fast Dissolving Active Pharmaceutical Ingredients (APIs)	Somenath Mitra	TITA-2026 Seed Grants
3	Settable Bone Allograft Matrix Formulations	Murat Guvendiren	TITA-2026 Seed Grants
4	NoirVPAI: The World's First Private and Secure AI Router	Hai Phan	TITA-2026 Seed Grants
5	Skin-Like Cardiac Patch for Personalized and Preventive Heart Care	Lin Dong	TITA-2026 Seed Grants
6	Functional Nano-carbon Enhanced Phase Change Materials (PCMs) for Improved Thermal Properties, and Long-term Durability	Eon Soo Lee	TITA-2025 Seed Grants
7	Rapid Detection of Per- and Polyfluoroalkyl Substances (PFAS) Using Paper Spray-Based Mass Spectrometry	Hao Chen	TITA-2025 Seed Grants
8	Revolutionizing Cardiac Care with Heart Energy	Lin Dong	TITA-2025 Seed Grants
9	DermaMech: Kirigami-Inspired Skin Grafts that Enhance Graft Success and Reduce Donor Site Morbidity	Farid Alisafaei	CERT-2026 Seed Grant
10	An Intelligent Unmanned Aerial Vehicle (UAV) Drone Robotic System Featuring Dynamic Sensor Reorientation Apparatus, Multimodal Sensor Fusion, and Artificial Intelligence (AI) for Smart and Automated Infrastructure Asset Management	Rayan Hassane Assaad	CERT-2026 Seed Grant
11	Toward the Development of an Interactive Virtual Environment for Motor Activity Deficits Assessment and Rehabilitation in Children with ADHD	Xiaobo Li	CERT-2026 Seed Grant

12	Bonepihist: new biomarkers for osteoporosis prediction and prognosis	Sara Casado Zapico	CERT-2026 Seed Grant
13	AgriTech in the era of AI: Vertical Farming Innovation and Implications	Jae-Hyuck Park	CERT-2026 Seed Grant
14	VentureWell	Mike Brizek	Director
15	NJ PFAS-PIC	Atam Dhawan	CSIO

Full Announcement	Check out our website:
and Additional Information: https://drive.google.com/drive/folders/1DB58qcHTEAdBTiFryqY4m-iolGarNbon?usp=drive_link	Center for Translational Research https://research.njit.edu/ctr/

Biographical Sketches

Atam P. Dhawan is Chief Strategic Innovation Officer and Senior Vice Provost for Research at the New Jersey Institute of Technology (NJIT). He is a tenured Distinguished Professor of Electrical and Computer Engineering, Executive Director of the Center for Translational Research, and Executive Director of Undergraduate Research and Innovation. He is an elected Fellow of the National Academy of Inventors (NAI) and NAI Innovation Ambassador, Fellow of the Institute of Electrical and Electronics Engineering (IEEE), Fellow of the American Institute of Medical and Biological Engineering (AIMBE), and Fellow of the International Academy of Medical and Biological Engineering (IAMBE) and serves on the NAI Board of Directors, NJII Board of Directors, R&D Council of NJ Board of Directors, IEEE Transactions on Biomedical Engineering Scientific Advisory Board, and the NIH Point-of-Care Research Network Advisory Board which he chaired from 2019-2025.

Dr. Dhawan is a recipient of numerous awards including Martin Epstein Award (1984), NIH FIRST Award (1988), Sigma-Xi Young Investigator Award (1992), IEEE EMBS Early Career Achievement Award (1995), Doermann Distinguished Lecture Award (1999), EMBS Distinguished Lecturer award (2012-2013), IEEE EMBS William J. Morlock Award in Excellence in Biomedical Technology (2021) and NJ Innovate 100 Leaders Award (2024). His research interests lie in medical imaging, medical image analysis, point-of-care technologies, and pattern recognition. Dr. Dhawan has received more than $86 million in research grants and contracts as Principal Investigator or Co-PI. He has published over 216 research papers and book chapters. He has also authored and co-authored several books in medical imaging, and image analysis. He holds several patents, some of which have been commercialized and being used for screening of skin-lesions for diagnosis of skin-cancers, and in the treatment of spider vein diseases.

Teik C. Lim is the 9th President of New Jersey Institute of Technology and also holds the title of Distinguished Professor of Mechanical Engineering. Prior to joining NJIT on July 1, 2022, Dr. Lim led the University of Texas at Arlington (UTA) as interim president from 2020-2022 and was Provost and Vice President for Academic Affairs at UTA from 2017-2020.

Dr. Lim's career has spanned from the private sector to university administration. He worked as an engineer at Structural Dynamics Research Corporation before joining The Ohio State University Center for Automotive Research as a research scientist. He taught at the University of Alabama beginning in 1998, as associate professor, before joining the University of Cincinnati in 2002, where he advanced from associate professor to professor to department head and to associate dean for graduate studies and research before, ultimately, being named Dean of the College of Engineering and Applied Science. Dr. Lim earned his Bachelor of Science in Mechanical Engineering (ME) from Michigan Technological University, his Master of Science in ME from the University of Missouri-Rolla, and his Ph.D. in ME from The Ohio State University.

Dr. Lim is internationally recognized as a leading scholar in the field of structural vibrations and acoustics as well as modeling and simulation technology. He was named a Fellow of the National Academy of Inventors in 2018. He is Fellow of the American Society of Mechanical Engineers and of the Society of Automotive Engineers, from which he received numerous research and teaching awards such as the Arch T. Colwell Merit Award in 2003 and the Ralph R. Teetor Educational Award in 2002. Dr. Lim also was recognized with the Thomas French Alumni Achievement Award in 2010, the GearLab Distinguished Alumnus Award in 2017, and the Distinguished Alumni Award for Academic Excellence in 2019 from his alma mater, The Ohio State University.

Krishna Juluru, MD, is a physician–scientist and digital health leader whose work spans federal government, academic medicine, and industry. He most recently served as a Medical Officer in the U.S. Food and Drug Administration's Digital Health Center of Excellence, where he led policy and partnership efforts across AI/ML-enabled devices, real-world evidence, and advanced clinical studies, and collaborated with global regulators and industry consortia. He also co-chaired the FDA Chief Scientist AI Working Group.

Previously, as a White House Presidential Innovation Fellow, Dr. Juluru founded and led RADx MARS, a cross-agency initiative developed with NIH/HHS/CDC/FDA/ONC and public-private partners to enable standards-based electronic communication for at-home digital diagnostics using HL7 and FHIR. This work helped connect diagnostic workflows with state and federal health systems and electronic medical records.

Before his federal service, Dr. Juluru held leadership roles in radiology informatics at Memorial Sloan Kettering Cancer Center and Weill Cornell Medicine, where he built advanced imaging and informatics programs and led early clinical deployment efforts for machine learning in imaging. He currently serves as an Adjunct Professor at the University of Pennsylvania and as Associate Editor for Informatics for *RadioGraphics* (RSNA).
Dr. Juluru earned his MD from Johns Hopkins School of Medicine and a BS in Applied Physics from Yale University.

Arjun Venkatesan is an Associate Professor in the Department of Civil and Environmental Engineering and Director of the Emerging Contaminants Research Laboratory (ECRL) at NJIT. His research focuses on the occurrence, fate, and treatment of toxic chemicals in the environment, with a current emphasis on PFAS and pesticides. He also develops novel analytical and monitoring approaches to assess human and environmental health risks associated with toxic chemical exposures and drug use. To date, he has secured and managed more than $8 million in externally funded research grants from federal (NSF, U.S. DoD, U.S. DOE, UBR), state, and industry sponsors. His work has been featured in media outlets including National Geographic, The New York Times, PBS programming, and the National Institutes of Health, among others. He is a recipient of the 2025 40 Under 40 Recognition Program award from the American Academy of Environmental Engineers and Scientists. He is a co-founder and Chief Technical Officer (CTO) of PFASolve Inc., where several of his technologies are being commercialized for the detection, capture, and destruction of PFAS. Dr. Venkatesan received his M.S. in Environmental Engineering from the University of Nevada, Las Vegas (2009), and his Ph.D. in Environmental Engineering from Arizona State University (2013).

Somenath Mitra a distinguished professor of chemistry and environmental science, has made extraordinary and consistent contributions to nanotechnology during his career at NJIT. Since arriving at NJIT in 1991, his research has steadily grown in funding, breadth, as well as national and international standing. His publication record has reached over 125 peer-reviewed journal articles and his research group has attracted national prominence in each of a number of areas including trace measurement and monitoring, nanotechnology and carbon tubes, and diverse applications ranging from solar cell technology to sea water desalination. Dr. Mitra runs the leading research group in the world working on the development of real-time trace measurement techniques, which is a field of utmost importance both commercially and in environmental monitoring. Dr. Mitra's recent work in the area of microwave-induced carbon nanotube purification and functionalization has earned him a national reputation. The highly soluble nanotubes synthesized

Murat Guvendiren is an Associate Professor and Director of the Materials Engineering Program within Chemical and Materials Engineering Department at NJIT, with a joint appointment in Biomedical Engineering. His research focuses on 3D bioprinting for tissue and organ development, biomaterials for stem cell control, and advanced functional materials. Dr. Guvendiren earned his BS and MSc in Metallurgical and Materials Engineering from Middle East Technical University and a PhD in Materials Science and Engineering from Northwestern University. He conducted postdoctoral research at the University of Pennsylvania and served as a Research Assistant Professor at Rutgers University, before joining NJIT in 2016. Dr Guvendiren published over 60 peer-reviewed papers, and obtained 8 patents, including 4 licensed patents. He is a recipient of the Edison Patent Award (2025), NSF CAREER Award (2021), NJIT Excellence in Research Award (2022), and NJIT Excellence in Innovative Teaching Award (2021). Since 2022, he is an elected Senior Member of the National Academy of Inventors.

Hai Phan is Founder & CEO of OppyAI Inc. At NJIT, Dr. Phan is an Associate Professor and Associate Chair in the Department of Data Science. His research focuses on privacy and security, machine learning, and mobile/cloud computing leading the AI4Good Lab research portfolio. His work has produced more than 90 publications in leading venues with significant recognition, including an AAAI 2023 Distinguished Paper Award and multiple best paper honors. Dr. Phan's research has been supported by the National Science Foundation and by long-term industry partners, including Qualcomm Technologies Inc., Microsoft, QCRI, Adobe Systems Inc., AT&T, and Wells Fargo.

Lin Dong is an Assistant Professor in the Department of Mechanical & Industrial Engineering at New Jersey Institute of Technology (NJIT). She earned her Ph.D. from Stevens Institute of Technology, where she received the Innovation and Entrepreneurship Doctoral Fellowship. Prior to joining NJIT, Dr. Dong was a Research Associate at Thayer School of Engineering at Dartmouth College, where she was honored with the Arthur L. Irving Institute for Energy and Society Award. Dr. Dong's research is supported by the National Institutes of Health (NIH), the National Science Foundation (NSF), the American Heart Association, the New Jersey Health Foundation, and others. Her work focuses on nanomaterials, nanofabrication, flexible electronics, soft robotics, and the development of energy harvesting and sensing technologies for biomedical and healthcare applications.

Eon Soo Lee is a Full Professor -Tenured in Mechanical and Industrial Engineering and the Principal Investigator in Advanced Energy Systems and Microdevices Laboratory at New Jersey Institute of Technology (NJIT), and the author of a leading book in the field, titled "Nitrogen-doped Graphene Nanomaterials for Electrochemical Systems – Fundamentals and Applications. He is an elected Senior Member of the National Academy of Inventors (NAI) since 2020, and was enlisted as Vanguard Leaders in Higher Education in New Jersey by NJBIZ in 2018. He has served as an Associate Editor of Journal of Translational Engineering in Health and Medicine (JTEHM). He's been a founding member of PFASolve Inc., which has been developing technologies to commercialize the detection, capture, and destruction of PFAS chemicals in water, soil, and the environment.

He has pioneered the nitrogen-doped graphene nanomaterials with metal-organic framework (N-G/MOF) through a new way of synthesis methodology called nanoscale high-energy wet (NHEW) ball milling process, for innovative electrochemical systems and thermal phase change materials applications, with surprising performance characteristics compared to existing commercial materials. Dr. Lee is also an innovator and founder of a startup company for the development of the biochip technology for disease detection, diagnosis and monitoring. The innovative nano biochip technologies pioneered by Dr. Lee simultaneously detect the multiple tumor biomarkers using multi-layered nano-electrode structures with on-chip plasma self-separation mechanism in a single microfluidic channel for the rapid and accurate sensitivity and specificity from the finger prick of blood.

His pioneered research on graphene-based new electrochemical catalysts and biochip technologies has gained many international recognitions in conferences and journals, and has received many awards including Vanguard Series: Leaders in Higher Education (2018) from NJBIZ, New Jersey Health Foundation Innovation Award (2017), NIH and IEEE Best Design Award (2017), National Science Foundation Innovation-Corps Award (2018 and 2016), TechConnect National Innovation Award (2017), Defense Innovation Award (2017), and the cover page highlight in International Journal of Energy Research (2017).

Prior to NJIT, He established extensive researches on energy materials, cells and systems, and microscale multiphase flow dynamics and thermal transport in both academia and industries including Stanford University, Samsung, and Hyundai. In particular, at Samsung Electro-Mechanics R&D Center as a Project Group Leader and Principal Research Engineer, Dr. Lee was awarded a prestigious Samsung Technology Award in 2011 due to his significant contribution to the innovative nano materials and electrochemical systems. He received his Ph.D. (2007) and MS (2004) at Stanford University, and his BS (1999) at Yonsei University, Seoul, Korea, all in Mechanical Engineering.

Hao Chen, graduated from Wuhan University in 1996 and obtained his Ph.D. degree from Purdue University in 2005. He is currently a professor in chemistry at New Jersey Institute of Technology (NJIT). Dr. Chen performs research on organic, biological, forensic and environmental mass spectrometry for trace analysis and instrument development and has published 160+ papers in peer-reviewed journals (H index 52).

Group website: https://research.njit.edu/chenlab/

Susan J. Schofer, Ph.D., is a Partner at SOSV and Chief Science Officer at SOSV HAX, the world's premier venture program accelerating early-stage hard tech startups. She works with new startups via early-stage investment, defining key milestones and go-to-market strategies, and is responsible for scientific oversight and building capabilities to support portfolio companies.

Prior to joining SOSV, Susan served as SVP Business Development for Modern Meadow and a member of the executive leadership team for over 7 years, developing new sustainable materials inspired by leather without any animals, where she led product, partnership, and go-to-market strategy and execution from early ideation through to commercialization. Before that, Susan spent 10 years in Silicon Valley working in roles spanning R&D, product development, product management, and business development for Amyris, a pioneer in synthetic biology, and Symyx Technologies, utilizing proprietary high-throughput robotic workflows to accelerate polymer and material discovery and development. Susan also worked as an analyst for management consulting company Mitchell Madison Group. Her passion is working closely with scientific and technical innovation to craft product and business strategy and partnering with founders and the broader ecosystem to implement and commercialize solutions to make a positive impact on people and planet.

Susan was an NSF Postdoctoral Fellow at Stockholm and Uppsala Universities, where she worked to develop catalyst systems for artificial photosynthesis. She holds a Ph.D. in chemistry from Caltech and an Sc.B. in chemistry from Brown.

Paul A. Sohl is CEO of the Florida High Tech Corridor (The Corridor), an organization serving a 23-county region anchored by three of the country's largest research institutions: the University of Central Florida (UCF), the University of South Florida (USF) and the University of Florida (UF). The Corridor's mission is to converge and catalyze the capacity of high tech, innovation, and bright minds to generate a global ripple effect that advances the lives of people in the communities it serves.

As CEO, Sohl facilitates connection and collaboration between the three universities and their partners in academia, industry and economic development. He also oversees The Corridor's portfolio of programs supporting research, marketing, workforce and entrepreneurship. This includes its cornerstone Matching Grants Research Program, which since its inception in 1996 has generated over $1 billion in verified downstream impacts; Cenfluence—a clustering initiative in partnership with the governments of Orange County, the City of Orlando and Duke Energy; STEM outreach; and Small Business Innovative Research (SBIR) facilitation.

Sohl joined The Corridor in June 2020, following more than three decades of service in the U.S. Navy. In his last command, Sohl led over 500 civilian and military personnel at the Navy's Operational Test & Evaluation Force in Norfolk, Virginia, where he directed the operational testing and evaluation of all Navy warfighting systems and capabilities. He has also commanded the Naval Aviation Fleet Readiness Center enterprise headquartered in Patuxent River, Maryland, where he was responsible for a workforce of over 16,000 and an operating budget of $2.9 billion; the Naval Air Warfare Center Weapons Division and Naval Test Wing Pacific in China Lake and Point Mugu, California; and the Fleet Readiness Center Southeast in Jacksonville, Florida. Sohl has extensive experience in simulation and training as a program director and test pilot and has served two tours overseas for Operation Desert Shield and Operation Enduring Freedom.
Sohl holds a bachelor's degree in aeronautical engineering from the Massachusetts Institute of Technology and

Marc Long, Ph.D. is currently Executive Vice President of R&D at MTF Biologics, leading the new tissue, product and technology development teams, clinical affairs, intellectual property and grants, and project management groups. Marc has also recently taken the lead for Strategy & Business Development at MTF, as well as Health Policy & Government Affairs. Marc's previous 20+ years of industry experience focused on evaluating and developing biologics products and technologies for device companies. His focus was to scout and transfer new technologies and companies within the Stryker portfolio through licensing, acquisition, and collaboration. Marc's previous roles with Stryker included leadership in the Spine, Orthobiologics, Sports Medicine, and Joint Reconstruction divisions. Before that, he worked at Smith & Nephew Orthopaedics and Biologics. Marc received his PhD in Bioengineering in 1999 and MSc in Materials Science & Engineering in 1992 from Clemson University after graduating from Arts et Métiers ParisTech in 1989 with an Engineering Diploma. Marc was born in Cannes, France.

Govi Rao is a visionary thought leader and seasoned business growth architect with more than 25 years of leadership experience globally - scaling businesses and transforming eco-systems across several industries including specialty chemicals, coatings, building materials, lighting, energy and the rapidly evolving Fourth Industrial Revolution. In his current role as CEO of Phase Change Solutions, Govi leads a team of highly innovative and inspiring leaders, with a vision to decarbonize our footprint and enable human health with sustainable solutions to manage temperature in any environment. Govi is a co-founder of CARBON Group Global - a sustainable impact enterprise scaling transformational solutions, specifically to address education, total resiliency of women and resource efficiency (food, energy & water).

Prior to CARBON, Govi was the President and Chief Executive Officer of Noveda Technologies a leader in water and energy management solutions, based in Bridgewater, NJ. Govi is the former Chairman and Chief Executive Officer of Lighting Science Group Corporation, a leading LED lighting Solutions Company. Govi's experience includes several global leadership roles in Philips Electronics and Rohm and Haas Company (now part of Dow Chemical) – spanning a range of businesses across several geographies. In addition to his experience with a wide business portfolio, Govi has extensive functional expertise that includes strategic planning, product management, marketing, operations, leadership development and general management. Govi has built winning teams that achieved extraordinary goals in start-ups as well as mature businesses – pioneering and inspiring profitable and sustainable growth.

Charmi Chande is the Founder and CEO of PFASolve Inc., an environmental technology startup developing innovative solutions for the detection, capture, and destruction of PFAS, commonly known as "forever chemicals." She earned her Ph.D. in Microbiology and brings more than a decade of international research and development experience across academia, industry, and entrepreneurship. Her expertise includes microfluidics, biosensors, environmental monitoring, technology commercialization, and startup leadership. Dr. Chande is a graduate of the CleanTech Open accelerator program and an active mentor and instructor within the NSF I-Corps ecosystem. She has guided numerous innovators through customer discovery and commercialization processes while advancing her own technologies from the laboratory toward market adoption. She is committed to translating scientific innovation into practical environmental solutions that help organizations manage emerging contaminants, improve water quality, and achieve sustainable operational outcomes.Ph.D. is a distinguished professional with over seven years of extensive global experience in deep tech technologies, focusing on microfluidics-based sensors for

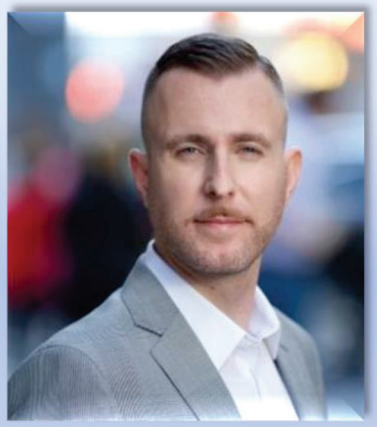
detecting osteoporosis, uncultivable microbes, forever chemicals, and microtoxins. With a background spanning India, Germany, and the USA, Charmi has made remarkable contributions to her field, boasting an impressive portfolio of 15+ publications and 4 patents. As the CEO of the NJIT spin-off PFASolve, LLC, Charmi has showcased her entrepreneurial acumen by spearheading the development of groundbreaking diagnostic solutions and fostering collaborative efforts within the scientific community.

Charmi's role as an NSF I-Corps Administrative Coordinator and mentor for NSF Northeast Regional I-Corps has provided her with invaluable insights into program management, grant administration, and strategic planning. Her dedication to advancing scientific knowledge and translating research into practical applications underscores her commitment to driving positive change in the field of microbiology and biotechnology.

Cassie Hallberg is the CEO of PureTrace Labs, a New Jersey-based startup focused on expanding access to PFAS testing through rapid mass spectrometry technologies. She has more than 25 years of experience in life sciences and consumer products, including leadership roles in marketing, strategy, and commercialization at both large corporations and early-stage startups. She has been part of two successful exits, including an IPO. At PureTrace, she leads the company's efforts to bring affordable, rapid PFAS screening to consumers, environmental professionals, and water quality providers. Cassie is passionate about improving public health through innovation in environmental testing.

Sheldon Fereira is the Co-Founder of Materium Technologies, a deep-tech materials startup developing scalable polymer nanocomposite coatings for highly reliable electronics. At Materium, Sheldon leads product strategy, customer discovery, software and AI development, helping translate the company's advanced materials platform into practical solutions for electronics manufacturers and OEMs. Sheldon brings a multidisciplinary background in Applied Physics, Data Science, and business commercialization. His work spans advanced materials, machine learning, business analytics, grant development, workforce development, and technology translation. He has contributed to research publications across materials science, heliophysics, and machine learning. He has participated in nationally recognized commercialization programs including NSF I-Corps, DOE Cradle to Commerce, Cleantech Open, and other deep-tech accelerator initiatives. In addition to his role at Materium, Sheldon serves as a Global Entrepreneur-in-Residence at the New Jersey Institute

of Technology's Center for Student Entrepreneurship, where he supports student founders, venture analytics, and the development of the entrepreneurship ecosystem.



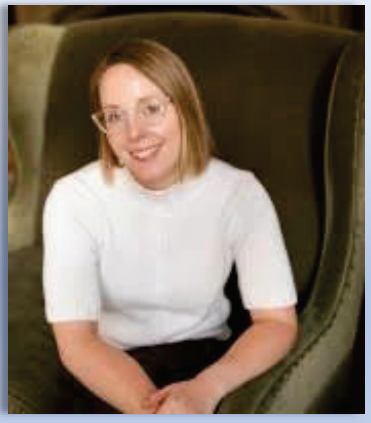
Michael Van Ter Sluis is the Vice President for Strategic Partnerships & Entrepreneurship. Prior to NJII, he was the Vice President of Innovation at the Council on Competitiveness – a Washington, DC science and technology think-tank.

There he worked side-by-side with leaders from industry, technology startups, and university presidents to educate elected officials on the U.S. science, technology, and innovation ecosystem and how public policies can support innovation as a source of economic growth and prosperity.

These successes are underpinned by almost a decade of private sector technical experience, performing engineering services for Fortune 500 companies.

Mike Brizek, Director, Higher Education Ecosystems. Mike leads and collaborates with his team to advance partnerships at the university, industry, and government levels. He was previously the program director of UIDP, where he led partnership engagement of top universities, industries, and federal agencies. He served in leadership roles in academia for 25 years, and has historically held close partnerships with federal programs through the National Science Foundation, the National Institutes of Health, the DOE, the National Institute of Standards and Technology, the National Oceanic and Atmospheric Administration, and the Advanced Research Projects Agency for Health. He holds a Ph.D. from the Pamplin College of Business at Virginia Tech, as well as Master's and Bachelor's Degrees from the University of South Carolina.

Sarah Wharmby, Program Officer at VentureWell. Sarah supports VentureWell's early-stage entrepreneurship programs, providing training for innovators in the Pioneer and Propel stages of the VentureWell Accelerator Program. Sarah has managed educational programs in both the nonprofit and higher education sectors; she has worked closely with social enterprises and social entrepreneurs, as well as student founders. Prior to joining VentureWell, Sarah managed entrepreneurship programming for undergraduate students at The Ohio State University. Sarah has a B.A. in Comparative Religion from Capital University and an M.T.S. in Ethics, also from Capital University.



TITA and CERT Seed Grants Executive Summaries

NJIT Technology Innovation Translation and Acceleration (TITA) Program

The **NJIT Technology Innovation Translation and Acceleration (TITA) Seed Grant** program will enable faculty and students to successfully accelerate the translation of their innovation to enterprise development and business incubation. The TITA seed grant program will foster entrepreneurial pathways from research and innovation to business and value creation with the acquisition of intellectual property, market validation, and engagement of stakeholders towards commercialization.

The TITA Seed Grants will increase awareness of the potential commercial benefits at earlier stages of the translation and market validation process and allow researchers and stakeholders to collaborate for entrepreneurial success. It will also help faculty to submit competitive translational research proposals to external grant funding opportunities. The TITA Seed Grants are funded by the NSF Accelerating Research Translation (ART) grant and NJIT Collaborative Research and Innovation Strategic Partnership (CRISP) investment plan through the NJIT Center for Translational Research.

NJIT Technology Innovation Translation and Acceleration (TITA) Program

TITA-2026 Seed Grants

1

Title of the Technology: Chemical Defluorination of PFAS Under Ambient Conditions

Proposers and Affiliations: Arjun Venkatesan; Associate Professor, Civil & Environmental Engineering, NJIT

Partnership Team: Charmi Chande, CEO, PFASolve, Inc.

Executive Summary:

Per- and polyfluoroalkyl substances (PFAS) are of increasing concern due to their widespread occurrence in the environment and their toxicity to humans and ecosystems, even at very low concentrations (parts-per-trillion levels). Because of the multiple carbon–fluorine bonds in their structures, PFAS are highly resistant to transformation and degradation. Available technologies that can destroy PFAS require extreme conditions such as high temperature, high pressure, and alkaline pH, and requires several hours of contact time for near-complete destruction. Such processes result in high energy consumption and high treatment costs. Additionally, many of these processes do not completely destroy PFAS and results in the generation of partially transformed byproducts of PFAS and the generation of short-chain/ultra-short-chain PFAS.

The technology proposed here addresses and overcomes these important challenges by providing a chemically-mediated complete destruction of PFAS at ambient conditions (i.e., room temperature, atmospheric pressure, and near-neutral pH) within minutes. The chemical reaction is mediated by the presence of sodium metal complexed with naphthalene, that serves as a strong reducing agent that defluorinates all types of PFAS. Laboratory testing revealed that the chemical reaction has the potential to destroy aqueous film-forming foam (AFFF) formulations, providing an opportunity to destroy residual AFFF wastes in fire suppression systems.

This project presents a highly innovative approach for the destruction of PFAS that has not been previously demonstrated. The proposed technology can be readily scaled up, as the chemical reactant is commercially available and the process design is straightforward. PFAS concentrates can be efficiently extracted from relevant waste streams using common solvents and subsequently treated with the sodium-metal reactant under ambient conditions. Given the rapidly expanding PFAS management market and the urgent need for effective destruction methods, this technology offers a significant competitive and environmental advantage. The awarded $100,000 TITA-Advanced Seed Grant will support advancing the technology from TRL 5/6 to a pilot- and demonstration-ready stage, paving the way for future commercialization.

2

Title of the Technology: *n*-Fast - A Nanotechnology Approach to Developing Fast Dissolving Active Pharmaceutical Ingredients (APIs)

Proposers and Affiliations: Somenath Mitra, PhD, Distinguished Professor, Chemistry and Environmental Sciences, NJIT

Partnership Team: Sai Rangarao, Senior Vice President of Commercialization, Pelthos Therapeutics; Marc Long, Executive Vice President, Research & Development, Clinical & Medical Affairs, MTF Biologics

Executive Summary:

The United States maintains a dominant position in the global pharmaceutical industry, accounting for 42.6% of the $1.48 trillion global pharmaceutical market. The country hosts some of the largest pharmaceutical companies globally, and American consumers have access to the most cutting-edge pharmaceutical products worldwide. A significant challenge currently confronting the pharmaceutical industry and drug development pertains to a substantial proportion (40 to 70%) of active pharmaceutical ingredients (API) exhibiting low water solubility, resulting in poor bioavailability and often therapeutic ineffectiveness. These hydrophobic molecules fall within the Biopharmaceutics Classification System (BCS) categories II and IV drugs. In light of this, the global market for BCS Class II and IV drugs could range from $600 billion to $1.036 trillion. The text later presents selected candidate APIs and their respective market sizes.

In addition to developing new drug molecules, the drug delivery market is experiencing a Compound Annual Growth Rate (CAGR) of 6.5%, with projections to exceed $375 billion by 2027. Another important consideration is the growing demand for rapid drug release, which anticipates this market to reach over $32 billion by 2027. Faster release is especially critical for BCS Class II and Class IV drugs, and the accelerated release proposed here will further propel the growth of this market segment. In summary, these represents our target market.

There are several conventional technologies that are employed to enhance the solubility, dissolution, and bioavailability of poorly soluble drugs. These are: Particle Size Reduction, Solid dispersions, Lipid based delivery systems, co-crystallization and complex formation.

We have developed a nanotechnology approach referred to as n-Fast to enhance the bioavailability and effectiveness of Active Pharmaceutical Ingredient (API) crystals by improving their water solubility, essentially creating a fast-dissolving version of the drug. Our technology aims to reformulate various insoluble APIs, falling under BCS Class II and IV, with bioabsorbable, functionalized nanoparticles (FNPs) featuring surface hydrophilization to enhance solubility, and ultimately efficacy. We propose the direct incorporation of FNPs into drug crystals during their formation in a way that preserves the crystal structure, polymorph, and physicochemical properties. The mechanism of fast dissolution.

Our initial work involved functionalized carbon nanotubes (fCNTs) and nano graphene oxide (nGO) as FNPs. While fCNTs and nGO showed excellent results, their potential cytotoxicity raised significant concerns. We have commenced the development of FNPs using FDA-approved bioabsorbable polymers. The n-Fast APIs are being evaluated in animal models to demonstrate improvements in pharmacokinetics and therapeutic efficacy. Currently, we are working with a

diverse range of APIs representing cardiovascular, diuretic, and antifungal therapeutics. These formulations are being optimized for rapid release to address acute medical conditions, providing a much-needed treatment solution for patients.

3

Title of the Technology: Settable Bone Allograft Matrix Formulations

Proposers and Affiliations: Murat Guvendiren, Associate Professor, Chemical and Material Engineering, NJIT

Partnership Team: Marc Long, Executive Vice President, Research & Development, Clinical & Medical Affairs, MTF Biologics

Executive Summary:

Osteoporosis and related conditions affect more than 10 million individuals in the United States, with an additional 40 million at risk due to low bone density. Bone defects resulting from trauma, infection, tumor resection, or degenerative disease remain a major clinical and socioeconomic challenge, contributing to an annual healthcare burden exceeding $5 billion in the U.S. alone. Although bone grafting remains a cornerstone of musculoskeletal repair and spinal reconstruction, current graft materials fall short of clinical demands. Demineralized bone matrix (DBM) putties and particulates exhibit poor injectability, variable bioactivity, and a high risk of migration after implantation. Synthetic cements and ceramics offer improved handling and strength but lack the osteoconductive and osteoinductive capacity required for true regeneration. Cellular allografts, while biologically active, are costly, inconsistent in performance, and poorly suited for minimally invasive delivery. Collectively, these limitations underscore a critical unmet need for a biologically functional, minimally invasive, self-curable bone graft technology that can be precisely delivered through small cannulas, conform to irregular defect geometries, resist washout, and provide immediate mechanical stability while supporting long-term bone healing.

We have developed a self-curable allograft composite technology that leverages human bone allograft (HBA) particles dispersed within a polysaccharide-based matrix (e.g., hyaluronic acid). The gradual release of calcium ions from HBA particles initiates ionic crosslinking, yielding a tunable self-curing mechanism that eliminates the need for external stimuli. In its primary application, the formulation is designed as a minimally invasive injectable bone void filler, providing defect conformity, graft stability, and biologically active integration. Beyond injectable use, this versatile technology can be readily adapted as a moldable putty or formulated for extrusion-based 3D printing, enabling the fabrication of patient-specific grafts with customized geometry and mechanical performance. This adaptability positions the platform as a next-generation solution for bone repair, bridging a critical gap between biologic function and surgical practicality across spine, trauma, and reconstructive applications.

4

Title of the Technology: NoirVPAI: The World's First Private and Secure AI Router

Proposers and Affiliations: Hai Phan, Associate Professor, Data Science, NJIT

Partnership Team: Ruoming Jin, Professor, Computer Science Department, Kent State University; My T. Thai, Professor, Computer & Information Sciences & Engineering Department, University of Florida; Yelong Shen, Principal Research Manager, Microsoft Azure AI

Executive Summary:

ChatGPT users send 2.5 billion requests daily, with over 750 million active users weekly. This massive number indicates a significant boost in productivity across industry sectors in the use of large language models (LLMs), covering every possible use case, from individual users to enterprises, organizations, and governments. The significant concerns and substantial risks associated with existing frameworks of LLM-based services include data privacy, security, and intellectual property (IP) protection. These concerns and risks are rooted in the fact that an AI service provider (cloud) observes a client's prompts, which often include confidential information such as legal documents, insurance claims, electronic health records, proprietary software code, and patents, etc., sent to LLMs hosted on the AI service providers' clouds to generate desired responses for daily and professional tasks. Without proper protection in a complicated LLMs' operation pipelines, leaks and data misuse have occurred and can occur everywhere. Also, a recent lawsuit spotlights that AI service providers typically store users' chat history indefinitely, with an uncertain future of whether this chat history can be used against individuals, enterprises, and organizations in legal incidents. Existing technology and solutions, such as data deletion, non-recording, data encryption and decryption, and trusted execution environments (TEEs) frameworks, have not been designed to adequately address these risks, with theoretical guarantees, while inevitably introducing unaffordable costs to users.
We have validated the technology to establish an end-to-end, neural-encrypted communication protocol between users and LLMs at scale, making it deployable to devices, computers, and cloud-based enterprises with significantly lower cost compared with existing competitors.

Our project develops the World's First Private and Secure AI Router (NoirVPAI), offering an end-to-end neural encrypted communication protocol for individuals and LLMs at scale based on our proprietary IP. In this protocol, the user is the only recipient of their prompt and decrypted response when communicating with the LLM on the cloud through a neural-encrypted message and response. No LLM, and no person can understand the neural-encrypted message and the response, with a theoretical guarantee (the chance to crack it is smaller than 1 in 10^{11}, 100 billion). In fact, the LLM observes meaningless content while it can still generate a response, which only the client can decrypt. The beauty of neural crypto is that it is incredibly lightweight, allowing it to scale to a massive number of users without interfering with the LLM's operation process. This property enables us to significantly reduce the cost by at least 30% compared with all existing techniques and ~1,000 times compared with operating a local LLM. Neural Crypto-powered NoirVPAI will revolutionize the way humans communicate with AI models, using our secure protocol. We have validated the technology with powerful code generation, coding at an agentic level 3, secure chat with confidential document analysis, and API services using a Qwen3 32B model, yielding highly competitive performance on the market. The TITA-2026 funds seed grant will bring this revolution closer to reality, enabling NoirVPAI to soon be available to a mass market of individual users, enterprises, and organizations.

5

Title of the Technology: Skin-Like Cardiac Patch for Personalized and Preventive Heart Care

Proposers and Affiliations: Lin Dong, PhD, Assistant Professor; Department of Mechanical & Industrial Engineering, NJIT

Partnership Team: Huzaifa Shakir, MD, MHA, FACS; Associate Professor, Department of Cardiac Surgery, Rutgers-New Jersey Medical School

Executive Summary:

Heart disease remains the leading cause of death worldwide, driving urgent demand for advanced, reliable, and patient-centric cardiac monitoring solutions that enable early detection, continuous care, and data-driven clinical decisions. Existing ambulatory devices, which rely primarily on electrocardiogram (ECG) monitoring, are limited by patient discomfort, rigid connections, poor breathability, short battery life, and inadequate long-term usability. These constraints hinder continuous monitoring, delay timely intervention, and reduce patient engagement, creating a clear gap in the market for next-generation, high performance wearable solutions.

The proposed skin-like dual-functional cardiac patch directly addresses these limitations by simultaneously capturing ECG and seismocardiogram (SCG) signals, providing a comprehensive, real-time assessment of cardiac function. It leverages advanced nanofibrous materials to detect mechanical heart vibrations and nanowire electrodes for robust electrical performance while maintaining skin-like flexibility, breathability, and biocompatibility. Its self-powered design converts cardiac motion into sensing signals, enabling autonomous, continuous monitoring without external power sources. The combination of dual-modal sensing, seamless skin conformity, and long-term wearability establishes a new benchmark for personalized, preventive cardiac care.

The commercial potential is substantial. The global cardiovascular devices market was valued at $57.35 billion in 2024 and is projected to reach $128.23 billion by 2034, reflecting a CAGR of 8.4%. Growth is fueled by increasing cardiovascular disease prevalence, rising healthcare expenditures, and adoption of wearable, minimally invasive, and home-based monitoring solutions. By delivering non-intrusive, dual-modal monitoring with superior comfort and usability, the patch provides a distinct competitive advantage over traditional ECG-centric devices. A provisional patent further secures intellectual property and enhances investment and commercialization prospects.

By combining innovative nanomaterials, flexible electronics, and patient-focused design, the dual-functional cardiac patch represents a transformative, investable platform. It supports earlier detection, informed clinical decision-making, improved patient outcomes, and positions itself to capture a significant share of the expanding wearable and home-based cardiac monitoring market, offering a high-impact, commercially viable solution for the future of cardiac care.

NJIT Technology Innovation Translation and Acceleration (TITA) Program

TITA-2025 Seed Grants

6

Title of the Technology: Functional Nano-carbon Enhanced Phase Change Materials (PCMs) for Improved Thermal Properties, and Long-term Durability

Proposers and Affiliations: Eon Soo Lee, Ph.D., Associate Professor, Mechanical and Industrial Engineering, NJIT

Partnership Team: Swati Agarwala, Ph.D., Technical Solution Manager, Phase Change Solutions Inc.

Executive Summary:

The need for effective thermal energy management is growing across sectors such as insulated packaging, cold chain logistics, temperature-sensitive product storage, building materials, and electronics cooling, aiming to boost energy and cost efficiency. As a result, demand for phase change materials (PCMs) that enhance thermal energy storage, and management is on the rise. However, widespread adoption of PCMs in these fields remains limited due to the lack of materials that are economical, safe, environmentally friendly, high in heat storage capacity, and durable for long-term use.

As the application of PCMs continues to grow across a wide range of industries, there is an increasing demand for materials that possess specific thermal properties tailored to the unique requirements of these applications. Besides, the producers of PCMs are facing significant challenges due to the limitation of available materials that meet both environmental and safety regulations. These stringent regulations, which are designed to ensure that materials are safe for human health and the environment, restrict the ability of manufacturers to develop and offer a broader range of PCMs. As a result, there is a growing need in the market for more diverse PCM options that not only comply with these regulatory standards but also exhibit the desired thermal properties for a wider variety of applications.

The PI proposes developing advanced PCMs with superior thermal properties and operational stability by integrating various PCMs, particularly bio-based types, with functional nano-carbon materials. Functional nano-carbon materials are integrated with a base PCM to ensure both physical and chemical interactions to enhance and tune thermal characteristics to meet specific application requirements. This approach aligns with regulatory requirements, as the base PCMs can be selected from environmentally safe materials. The enhancements are achieved through the specific functionalities of nano-carbon materials tailored to ensure desired interactions with selected base

PCMs, thereby expanding material choices across a wide range of thermal energy storage applications.

The proposed PCMs are high-performing, cost-effective, safe, and environmentally friendly. By leveraging interactions between nano-carbon materials and carefully selected base PCMs, these advanced PCMs achieve targeted thermal properties while preserving structural integrity, enhancing durability during operation.

7

Title of the Technology: Rapid Detection of Per- and Polyfluoroalkyl Substances (PFAS) Using Paper Spray-Based Mass Spectrometry

Proposers and Affiliations: Hao Chen, Ph.D., Professor, Department of Chemistry & Environmental Science, NJIT

Partnership Team: Charmi Chande, CEO, PFASolve, LLC

Executive Summary:

PFAS are of great concern due to their persistence, toxicity, and potential for bioaccumulation in the environment. Exposure to per-fluorooctanoic acid (PFOA) and per-fluorosulphonic acid (PFOS), two specific PFAS compounds, has been linked to adverse effects on fetal development, such as decreased birth weight, and has also been shown to suppress vaccine responses, resulting in lower serum antibody concentrations in children. In addition, studies have shown that the presence of PFAS can increase the production of reactive oxygen species (ROS) through oxidative stress, induce DNA damage, and cause cancer and inflammation.14 Traditional PFAS analysis by mass spectrometry (MS) is time-consuming and takes a few hours according to the EPA method referred by 533 where prior run in LC-MS takes laborious sample preparation by solid phase extraction (e.g., extraction and desalting) technique.

In the PI's laboratory at NJIT, we developed a fast detection of PFAS by paper spray (PS)-based MS techniques, which only takes 1-3 min for detection of PFAS from a variety of different samples (water samples, soils, food packaging materials, etc.) In addition, our method is highly sensitive (limits of detection:1-4 ppt for PFOA and PFOS). These results suggest the high potential of our new technique in real-world environmental screening and analysis of PFAS. This work was published in Journal of Hazardous Materials (JHM, 2024, 465, 133366; Journal impact factor 14.2 in 2021).

This TITA grant aims to 1) Enhance the sensitivity of PFAS detection protocol to go beyond 1 ppt, which would be crucial for detecting PFAS in urine to track exposure patterns and evaluate kidney function's role in PFAS elimination in the future. 2) Build a position-controlled PSI and DPS platform for gaining high signal reproducibility for improving quantitative PFAS analysis 3) Identify the key partner and develop the PFAS detection protocol compatible with on-site MS.

At the conclusion of the TITA grant, we are expected to develop a more robust, sensitive, and selective protocol for PFAS detection from real-world samples, such as drinking water. Additionally, the protocol must be optimized for compatibility with an on-site mass spectrometer developed by our identified key partner.

8

Title of the Technology: Revolutionizing Cardiac Care with Heart Energy

Proposers and Affiliations: Lin Dong, PhD, Assistant Professor, Department of Mechanical & Industrial Engineering, NJIT

Partnership Team: Huzaifa Shakir, MD, MHA, FACS; Associate Professor, Department of Cardiac Surgery, Rutgers-New Jersey Medical School

Executive Summary:

Heart disease is the leading cause of death globally. The global cardiovascular devices market was valued at $63.49 billion in 2024 and is projected to reach $104.08 billion by 2031, with a compound annual growth rate (CAGR) of 7.03% during this period. This growth is primarily driven by the high prevalence of cardiovascular diseases, an aging population, and the increasing demand for innovative, cost-effective treatment options that minimize the need for surgical interventions. Cardiac pacemakers and implantable cardioverter-defibrillators are effective tools for treating heart block and ventricular dysrhythmias in patients with heart disease. Notably, leadless pacemakers (LPs), which are 90% smaller than traditional transvenous pacemakers, have demonstrated excellent safety and efficacy in both short-term and intermediate follow-ups. However, the clinical utility of all those cardiovascular devices is compromised by the limited battery life.

Studies show that over 40% of LPs fail within three years, despite manufacturers' claims of longer longevity, while the average post-implantation longevity of traditional pacemaker recipients has increased to over 15 years. This creates a significant mismatch that impacts clinical practice and incurs substantial economic costs. Battery depletion or malfunction necessitates new implantations due to limited retrieval experience. Although LPs represent an advancement in cardiac pacing, they also come with complications. Clinical trials report major issues, such as device dislodgement and cardiac perforation, as well as infection at the implantation site, which can lead to longer hospital stays. Therefore, the risks, costs, and complications of LP surgeries highlight the need for alternative power solutions to extend the longevity of cardiovascular devices, reduce the need for replacements and surgeries, and improve patient care.

Dr. Dong’s lab is developing advanced energy harvesting technology that significantly extends the lifespan of LPs by transforming the heart's natural mechanical energy into electrical power. Designed to revolutionize LPs, this technology leverages advanced functional nanomaterials, innovative geometric designs, and seamless integration with existing systems to significantly enhance patient care. The key breakthrough lies in the incorporation of cardiac energy harvesters optimized for the heart's dynamic environment. By leveraging flexible, biocompatible materials to capture even subtle cardiac motions, this technology converts them into electrical energy to sufficiently autonomously

power the pacemakers. The energy harvesters maintain the compact form factor of existing LPs while enhancing functionality through sustainable energy solutions.

This cardiac energy harvesting strategy addresses the most pressing challenges of energy consumption and the need for pacemaker replacement surgeries. With anticipated success, it promises to transform the lives of individuals facing the burden of periodic pacemaker replacements, offering longer-lasting implantable biomedical devices that reduce both surgical risks and costs. Ultimately, this innovation not only enhances patient outcomes but also elevates the overall quality of life, marking a significant leap forward in medical technology.

Collaborative Early Research Translation (CERT) Seed Grant Awards Program

To accelerate NJIT's trajectory towards increased collaborative research and innovation funding for higher faculty and student success, a new strategic initiative, Collaborative Early Research Translation (CERT) Seed Grants supported by the U.S. National Science Foundation Accelerating Research Translation (ART) program was launched in 2023 to invest in translational research of high potential impact. These CERT seed grants will initiate early translation of research and innovation, working collaboratively with an external partner, towards developing proof-of-feasibility and potential intellectual property to build foundation to submit competitive proposals for external research translation acceleration funding opportunities, or internal NJIT TITA (Technology Innovation Translation Acceleration) seed grants for further advancement in translational research and market validation.

NJIT's internal seed funding opportunities including FSG, CERT and TITA seed grants are critical components of the strategic Research, Innovation and Technology Entrepreneurship (RITE) ecosystem as outlined in the 2030 Strategic Plan. Each CERT Seed Grant is awarded $25,000 with which is funded by the NSF Accelerating Research Translation (ART) grant and NJIT Collaborative Research and Innovation Strategic Partnership (CRISP) investment plan through the NJIT Center for Translational Research.

Collaborative Early Research Translation (CERT) Seed Grant Awards FY2026 (July 2025 - June 2026)

1

Title of the Technology: DermaMech: Kirigami-Inspired Skin Grafts that Enhance Graft Success and Reduce Donor Site Morbidity

Proposers and Affiliations: NJIT Principal Investigator: Farid Alisafaei, Mechanical Engineering

Partnership Team: Guy Genin, Professor, Washington University St. Louis

Executive Summary:

Split-thickness skin grafting is a critical treatment for severe wounds affecting approximately 8.2 million Americans annually. However, failure rates remain high, and clinical outcomes are still unpredictable. A first and fundamental limitation is that the expansion of skin grafts after surgical meshing and intraoperative stretching is not predictable. Current commercial meshing devices provide poor estimates of post-expansion area, leaving surgeons uncertain about how much donor skin is actually required to cover a wound. A second challenge is the high non-uniform stress generated within the graft. Our laboratory has identified that this uneven stress activates fibroblast mechanotransduction pathways, inducing a persistent "mechanical memory" that drives excessive contraction and long-term graft failure.
Building on these insights, we have developed a new technology that reengineers the meshing pattern to both (i) enable predictable and controllable graft expansion and (ii) regulate internal stress distribution to prevent pathological fibroblast activation. This mechanics-based approach provides a rational pathway to improve surgical planning and enhance graft reliability and clinical outcomes.

2

Title of the Technology: An Intelligent Unmanned Aerial Vehicle (UAV) Drone Robotic System Featuring Dynamic Sensor Reorientation Apparatus, Multimodal Sensor Fusion, and Artificial Intelligence (AI) for Smart and Automated Infrastructure Asset Management

Proposers and Affiliations: NJIT Principal Investigator: Rayan Hassane Assaad, Civil and Environmental Engineering

Partnership Team: Wei Wang, CEO and founder Operating Officer, UrbanTech Consulting Engineering

Executive Summary:

Unmanned Aerial Vehicles (UAVs) or drones are pivotal in the field of infrastructure inspection and monitoring, offering multiple operational benefits such as improved accessibility, enhanced efficiency, and increased safety. Despite the growing adoption of UAVs in infrastructure asset management applications, current systems often face challenges related to limited sensor adaptability and data collection/coverage capabilities, payload limitations, and inefficient power consumption ultimately reducing inspection fidelity and mission endurance. Therefore, there is a pressing need to enhance the adaptability, intelligence, and sensing capabilities of UAV-based robotic inspection platforms. This project proposes a novel UAV robotics system, designed with a rotating sensor belt mechanism – a Dynamic Sensor Reorientation Apparatus (DSRA) – to advance the monitoring setup by allowing sensors to move 360-degrees across the body of the drone, thus increasing its fidelity. This mechanism addresses key limitations associated with the multi sensor payload distribution by reducing the weight, optimizing energy usage and allowing full frame coverage of the targets without the need of extensive UAV maneuvering in complex tasks (i.e., inspection). In addition to the reorientation system, the proposed method integrates several emerging states of the art technologies such as multi-modal sensor fusion with AI algorithms (i.e., attention-based region proposal deep learning segmentation architecture) for accurate defect identification and proper quantification. This novel robotic system introduces new frontiers in both aerial hardware and software integration. This innovation intersects with two clusters within the NJIT research enterprise: robotics and machine intelligence, and data science and management.

3

Title of the Technology: Toward the Development of an Interactive Virtual Environment for Motor Activity Deficits Assessment and Rehabilitation in Children with ADHD

Proposers and Affiliations: NJIT Principal Investigator: Xiaobo Li, Biomedical Engineering

Partnership Team: Qinyin Qiu, Associate Professor, School of Health Professions, Rutgers University

Executive Summary:

Motor activity deficit is one of the key deficits in ADHD that manifests in tasks requiring sequential movements and fine-motor skills. The routine stimulant approach for ADHD symptom management has been widely concerned about its severe side-effects, high cost, and inefficiency in addressing the motor activity deficit in ADHD. Exergame-based intervention for motor activity deficit in ADHD, which is personalized, affordable, easily accessible, and with minimal side-effect, has not yet been sufficiently investigated. To address this press need in the field, the overall goal of this research program is to develop and disseminate a virtual reality (VR)- based exergame intervention platform, the Sequential Movement Assessment and Rehabilitation Toolkit (SMART), targeting the behavioral impairments and neurobiological substrates associated with motor activity deficit in ADHD. The short-term objectives of this pilot research focus on the development of SMART and testing its feasibility and reliability in healthy children. Based on the critical pilot results generated from this pilot research, we will apply for large-scale grants from federal agencies to conduct longitudinal and trail-based studies in sizable samples, to solidly validate the behavioral and neurobiological improvements associated with this innovative intervention approach in ADHD. The market need of

our proposed product is pressing and sizable. The ADHD apps market is projected to grow significantly, with a global value of $1.7 billion in 2024, expected to reach $4.9 billion by 2033. This internal funding is needed for our collaborative research program from NJIT and Rutgers NJMS to address the high impact scientific and societal needs of ADHD, which is one of the major general-public health concerns.

4

Title of the Technology: Bonepihist: new biomarkers for osteoporosis prediction and prognosis

Proposers and Affiliations: NJIT Principal Investigator: Sara Casado Zapico, Chemistry and Environmental Science

Partnership Team: Victoria Dominguez, Assistant Professor, Lehman College-CUNY

Executive Summary:

The goal of this proposal is to address one of the fundamental problems in the elderly: the correct diagnosis and prognosis of osteoporosis to improve quality of life in a vulnerable population. This will be approached by the identification of novel biomarkers through the simultaneous assessment of epigenetic and histological changes in bone tissues during the adult lifespan. The significance and market need of this proposal relies on the current medical costs associated with osteoporosis treatment and moreover the post-fracture hospitalization and recovery, which not only is an economic burden, also increases disability and reduces lifespan, significantly hampering healthy aging. The identification of novel biomarkers could lead to the development of preventive
strategies and/or more targeted and less expensive treatments. The expected outcome of this proposal is that a two-way assessment of methylome-bone architecture, in combination with machine learning approaches, will identify specific bone aging biomarkers to address and potentially overcome the effects of OP. These outcomes are based on trial data generated by the PIs and the proven effectiveness of both techniques individually to evaluate bone aging. Our future plans will include the development of the first epigenetic clock for bone tissue, filing a patent with the newly discovered biomarkers, and applying for NIH, NSF and NIJ grants to target both clinical and anthropological questions of interest, based on the broader impacts of the findings of this project. Our justification for internal funding is to develop enough robust preliminary data to be able to apply for external federal funding.

5

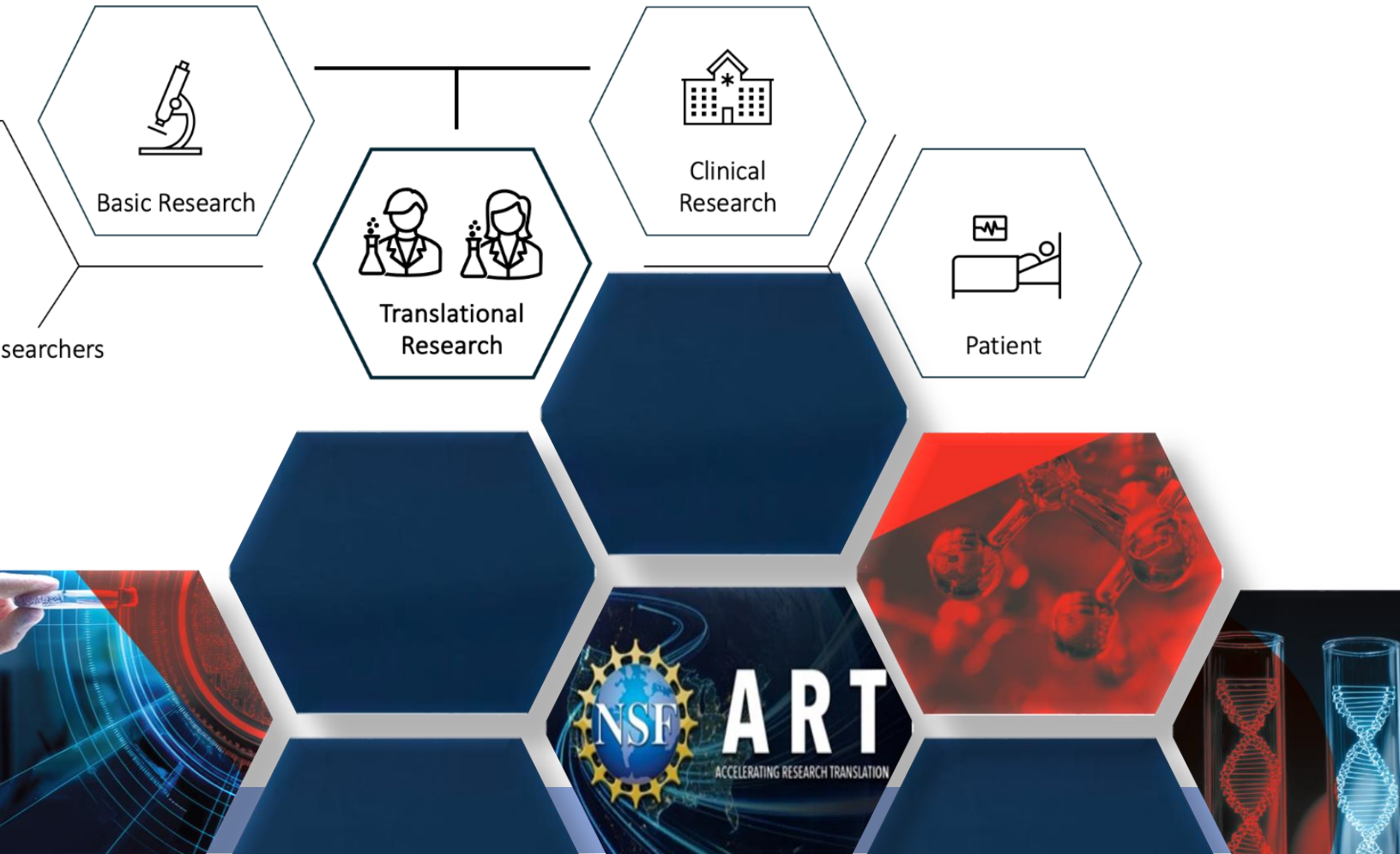
Title of the Technology: AgriTech in the era of AI: Vertical Farming Innovation and Implications

Proposers and Affiliations: NJIT Principal Investigator: Jae-Hyuck Park, MTSM
NJIT Co-Principal Investigators: Jim Shi, MTSM

Partnership Team: Bryan Santos, Director of Corporate Development at Aerofarms, AeroFarms

Executive Summary:

In the era of AI, Agricultural Technology (AgriTech) is rapidly advancing. Vertical farming (VF), an innovative form of AgriTech, has been widely implemented to meet the growing population's needs by cultivating vegetables and crops in vertically stacked layers within controlled environments using advanced agricultural techniques, such as IoT, Machine Learning, AI-driven tools. One close business example is AeroFarms, originally located in Newark, NJ. Through this project, we investigate the operational innovativations, market dynamics and economic benefits of VF. The merit of this project lies in its potential to address the urgent need for sustainable transformation in AgriTech via leveraging AI. VF offers substantial advantages, including increased efficiency, yield stability, and reduced energy consumption. VF also strengthens coordination between farmers and retailers, promoting more resilient and sustainable agricultural supply chains. We begin by quantifying VF's gains in economic efficiency and reliability. Building on this analysis, we develop a game-theoretical model to explore the dynamics of collaboration-competition among firms. The project also delivers actionable insights and best practices for agribusinesses to adopt VF more electively. This work can contribute significantly to the field of entrepreneurship, sustainable operations and supply chain management and pave the way for the broader adoption of advanced AgriTech.



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