



May 15–17, 2024 Université de Lorraine Nancy, France

## **CONFERENCE & WORKSHOP**

# WELCOME TO BIOMATERIALS AND BIOFABRICATION!

Biomaterials have been utilized by humans for millennia and are the cornerstone of tissue engineering, regenerative medicine, and bioencapsulation of active compounds. Biomaterial-based drug delivery systems are becoming more popular due to their improved delivery localization, longevity, and control. However, material composition is not the only important consideration in biomaterial development. The processes used to generate biomaterial structures also affect their use and function. Biofabrication techniques allow for precise control of biomaterial configuration. Researchers have developed an array of biofabrication tools and methods in this rapidly growing field, with improvements in technology and dropping costs leading to increased democratization of use.

Biomaterials and Biofabrication: Emerging Technologies Conference and Workshop aims to bring together researchers, scientists, and experts from various disciplines with an interest in biomaterials and biofabrication to explore and discuss the latest developments in the field. The conference includes a lineup of esteemed invited speakers and exciting presentations selected from our submitted abstracts. We are so glad that you are here and hope you will have an enlightening and productive time. Biomaterials and Biofabrication intends to create an inclusive environment and we have zero tolerance for discrimination, harassment, and bias. If there is anything we can do to improve your conference experience, please let us know. We also look forward to seeing you next year.

Elmira Arab-Tehrany, PhD. Yupeng Chen, PhD.

Stephane Desobry, PhD. Ali Tamayol, PhD.

## **DAY 1 - MAY 16TH**

8:00 – 8:20	Coffee/ Breakfast		
8:20 – 8:30	Opening Remarks by the Conference Chairs		
8:30 – 10:00	<ul> <li>Session 1: Drug Delivery and Tissue Engineering Chair: Ali Tamayol</li> <li>Elmira Arab-Tehrany*: New generation nanoliposomes for biomedical applications</li> <li>Sahar Salehi-Müller**: Development heterogeneous structures for tissue enginee applications: from processing to cell interactions</li> <li>Halima Alem: Smart core/shell magn nanoparticles and their further use in cancer thera</li> <li>Thi-Thanh-Trúc Phùng: Potential uses of sod alginate as a coating material for oxygen-sensi pharmaceuticals</li> <li>Pier Francesco Ferrari: Polyphenol-Loa Electrospun Biomaterials for Vascular Tis Engineering</li> </ul>		
10:00 – 10:20	Break		
10:20 – 12:05	<ul> <li>Session 2: Biomaterials and Biofabrication</li> <li>Chair: Mohammad A. Qasaimeh</li> <li>Amir Sheikhi**: Engineering medicine at multiscale via granular hydrogels</li> <li>Jordane Jasniewski**: Enzymatic modification of polysaccharides: a way to improve their functionalities by a green process</li> <li>Emmanuel PJM Everaert **: New chemistry design for 100% derived natural, readily biodegradable &amp; more sustainable petroleum jelly suitable for cosmetic applications</li> <li>Abolfazl Heydari**: Structurally dynamic alginate-based hydrogels for biomedical applications</li> <li>Tugdual Haffner: Nerve-derived tissue matrix bioink concentration influences neurite outgrowth and substrate alignment of 3D printed conduits</li> <li>Madeline Vauthier: Smart polymeric nanoparticles: when process meets chemistry</li> </ul>		

12:05 – 13:00	Lunch and Cellink Demo		
13:00 – 14:00	Session 3: Keynote Talk - Dr. Aldo Boccaccini Chair: Elmira Arab-Tehrany		
14:00 – 14:40	Session 4: Biomaterials Chair: Cyril Kahn  • Alix Deymier**: Formation of tunable bioapatites: controlling solubility, structure, and mechanics  • Mikayla Moody: Sexual dimorphism in murine skeletal tissue exposed to acidic conditions		
14:40 – 15:00	Break		
15:00 – 16:20	Session 5: Emerging Applications Chair: Emmanuel PJM Everaert  Razieh Farzad**: Seas of opportunity: building a blue circular bioeconomy with biomaterials  Indranil Sinha**: Clinical problems in need of tissue engineering solutions  Jacob Quint**: Bridging the gap: translational strategies in biomaterial delivery and biofabrication for tissue regeneration and their clinical implementation		
16:20 – 16:30	Break		
16:30 – 17:20	Session 6: Lightning Talks Chairs: Elmira Arab-Tehrany, Elaheh Omidvari  Btissam Benbakrim  Seyed Mohammah Hosseini  Noah Pereira  Zhaleh Ladjevardi  Daniele Pedroni  Parul Chaurasia  Reyhaneh Nasr Azadani  Regis Badin  Chanez Bennacef		
17:20 – 18:20	Networking Session		

### **DAY 2** - MAY 17<sup>TH</sup>

	8:00 – 8:30	Coffee/ Breakfast		
	8:30 – 10:00	<ul> <li>Session 7: Nanomaterials and Encapsulation         Chair: Amir Sheikhi         Yupeng Chen*: Janus base nano-rods for mRNA delivery for osteoarthritis treatment         Stephane Desobry*: Controlled delivery of active biomolecules from nano/micro-capsules         </li> <li>Ole Thaden: Post-bioprinting delivery of biomolecules in 3D tissue-like constructs using cell-sized synthetic vesicles</li> <li>Cristina Prieto: Encapsulation of challenging bioactive compounds by high throughput room-temperature electrospraying assisted by pressurized gas</li> <li>Lucie Mašková: Formulating nature-inspired phytochemicals for antibacterial application</li> </ul>		
Ī	10:00 – 10:20	Break		
	10:20 – 12:05	<ul> <li>Session 8: Bioprinting and Wound Healing</li> <li>Chair: Sahar Salehi-Müller</li> <li>Ali Tamayol*: In vivo bioprinting: A new paradigm in regenerative medicine</li> <li>Irem Bayindir-Buchhalter **: Advanced Materials Editor-in-chief</li> <li>Evelyn Mollocana Lara: Gelatin-based foam biomaterial as a supporting bath for embedded bioprinting of vasculature</li> <li>Mikaela Kutrolli/Noah Pereira: 3D printing of polycaprolactone scaffold with multiscale porosity via incorporation of sacrificial sugar particles</li> <li>Sacha Barberat: DLP 3D-printed gelatin-pluronic biomimetic scaffolds promoting glial cells alignment for spinal cord regeneration</li> <li>Zakaria Baka: A coculture-based, 3D bioprinted ovarian tumor model and its applications to study cisplatin activity</li> <li>Fatemeh Ahmadpoor: Self-assembled tannic acidinorganic hybrid nanoflowers coated on electrospun fibers for wound dressing applications</li> <li>Lindsay Barnum: Microneedle-decorated degradable</li> </ul>		

negative pressure wound therapy dressing

12:05 – 13:00	Lunch and Cellink Demo	
13:00 – 14:00	Session 9: Keynote Talk - Dr. João Mano Chair: Stephane Desobry	
14:00 – 14:40	<ul> <li>Session 10: Microfluidics in Tissue Engineering         Chair: Cyril Kahn     </li> <li>Mohammad A. Qasaimeh**: Multifunctional modular         "LEGO-like" microfluidic probes for biomedical applications     </li> <li>Marianne Parent: Is microfluidics a good option to produce alginate microparticles encapsulating a fragile hydrophilic drug?</li> </ul>	
14:40 – 15:00	Break	
15:00 – 16:30	Session 11: Emerging Applications Chair: Yupeng Chen  • Jianjun Guan**: Sustained oxygenation to promote healing of diabetic wounds  • Feng Guo**: Intersection of organoids, AI, and medicine  • Ali Ahmadi**: Exploring the unculturable human gastrointestinal microbiota  • Émilie Velot**: Extracellular vesicles from dust to therapeutics  • Andreas Reisch: Gold and lanthanides in plastic: luminescent polymeric nanoparticles for bioimaging	
16:30 – 16:40	Break	
16:40 – 17:30	Session 12: Lightning Talks Chairs: Lindsay Barnum, Evelyn Mollocana Lara  Mohammad Akrami-Hasan-Kohal  Christina Andrianina Rakotoarisoa  Meiling Wu  Corentin Peyret  Elaheh Omidvari  Ruiz Maria Celeste  Laxmi Manasa Bodapati  Mohammad-Mahdi Assaf  Anahita Ahmadi Soufivand  Nathan Wisniewski	
17:30 – 18:00	Closing Remarks – Student Award Ceremony	



**Elmira Arab-Tehrany** 

Dr. Arab-Tehrany is a Professor at Lorraine University/LIBio and an adjunct professor at the University of Connecticut (USA) and West Virginia University (USA). She is the director of the doctoral school of SIReNa. She has worked on the elaboration and characterization of nanoliposomes as active nanovectors to encapsulate different active molecules used for the prevention of Alzheimer's and cancer and tissue engineering applications.

Her team has expertise in green extraction of polar lipids from by-products of fish, microfluidics, and molecular transfer. Since her recruitment (2007), she has coordinated or participated in more than 20 international, national, and industrial projects. She has been an expert at the ANSES regulatory agency since 2010 and various European projects (HORIZON-EIC). She has co-authored more than 100 scientific publications in international journals, 10 book chapters, 20 invited speaker talks, and more than 50 oral presentations. She has supervised 20 thesis students, 6 post-doctoral researchers, and 34 master students.



Yupeng Chen

Dr. Chen is an Associate Professor in the Department of Biomedical Engineering at the University of Connecticut. Holding both an M.Sc. and a Ph.D. in biomedical engineering and chemistry from Brown University, Dr. Chen's long-term research interest lies in the design and development of DNA-inspired Janus-based nanomaterials for regenerative engineering applications.

He holds 10 US patents and 14 international patents in Janus-based nanotechnology, some of which have been successfully licensed to industry partners. Dr. Chen has authored one book, ten book chapters, and 106 peer-reviewed publications, and he and his lab have delivered 124 conference presentations and invited talks. His achievements have been recognized with the Faculty Early Career Development (CAREER) award from the NSF, the Discovery award from the DOD, and the grand prize in the New Investigator Recognition Awards from the Orthopaedic Research Society—where he was the top winner among 545 international candidates. He was elected as a senior member of the National Academy of Inventors (NAI) in recognition of his efforts to translate scientific breakthroughs into practical applications.



**Stephane Desobry** 

Dr. Desobry earned an Engineer's degree in Food Science (ENSAIA engineering school.) and a PhD in Food Science from I.N.P.L University in 1991. He is now a full Professor since 1999 at the University of Lorraine (France). His research concerns biomolecule science and preservation. He works particularly on biomolecule encapsulation and controlled release. He is an expert in encapsulation technologies to stabilize actives, release modeling, and in molecule stability and activity.

He is the coordinator of the "Biomolecules for the Bioeconomy" (B4B) program (2024-34) that brings together more than 200 researchers from 21 laboratories and 18 companies (10M€ budget). Stephane is also leading the Federation "The One Bioeconomy" which associates 400 academic and industrial researchers in the Grand East Region in France.



Ali Tamayol

Dr. Tamayol is an Associate Professor of Biomedical Engineering at the University of Connecticut Health Center. He had been an Assistant Professor of Mechanical & Materials Engineering at the University of Nebraska, Lincoln, and an Instructor of Medicine at Harvard Medical School. He received his BSc from Shiraz University followed by MSc from Sharif University of Technology in Mechanical Engineering. He received his PhD from Simon Fraser University in 2011. He did his postdoctoral training in Biomedical Engineering at McGill University, Harvard Medical School, and Massachusetts Institute of Technology.

His research involves advanced engineering technologies for generating biomaterial-based regenerative medicine and drug delivery tools. He has authored more than 180 journal papers, 5 book chapters, and 16 issued patents or applications. In addition, he has given over 90 seminars at various conferences and academic institutions. His publications have been cited more than 19,000 times and he has been the recipient of several awards including the NSERC Postdoctoral Fellowship, BCIC Scholar Award, and Alinasab Prize of ISME.

#### **Keynote Speaker**



Aldo R. Boccaccini

Dr. Boccaccini is a Professor of Materials Science (Biomaterials) and Head of the Institute of Biomaterials at University of Erlangen-Nuremberg, Germany. He is a visiting professor at Imperial College London, UK, and RWTH Aachen University (Germany). He has an Engineering degree from Instituto Balseiro, Argentina (1987), and a Doctorate in Engineering Sciences (Dr.-Ing.) from RWTH Aachen University, Germany (1994). He had post-doctoral appointments at University of Birmingham, UK (1994-1996), and at the University of California, San Diego, USA (1996-1997).

The research activities of Prof. Boccaccini are in the field of ceramics, glasses and composites for biomedical, functional and/or structural applications with focus on bioactive materials, scaffolds for tissue engineering, biofabrication and antibacterial coatings. Boccaccini has published more than 1000 scientific papers and 25 book chapters. He has co-edited 8 books His work has been cited more than 69,000 times (h-index = 114, Scopus®, h-index = 133, Google Scholar®) and he was included in the "Highly Cited Researchers" lists in 2014 and 2018 (Clarivate Analytics). He is listed also as one of the most cited researchers in the world according to the latest edition of the Stanford List of Highly Cited Researchers published in 2023 (Version 6).

#### **Keynote Speaker**



João F. Mano

Dr. Mano is a Full Professor at the Chemistry Department of University of Aveiro, Portugal, and vice-director of the Associate Laboratory CICECO – Aveiro Institute of Materials, where he is directing the COMPASS Research Group. He has also an appointment as Invited Professor (classe exceptionelle, since 2014) at University of Lorraine (France), Visiting Professor in KAIST (South Korea) – 2019 and Adjunct Professor at Ajou University (South Korea) since 2020. He is the director of the doctoral program on Biotechnology at University of Aveiro.

His research focuses on the application of advanced biomaterials and cells to advance multidisciplinary concepts in the field of regenerative and personalized medicine. Specifically, he utilizes biomimetic and nano/micro-technology approaches to develop polymer-based biomaterials and surfaces for the creation of biomedical devices with enhanced structural and multi-functional properties. He also engineers microenvironments to regulate cell behavior and organization, with the goal of clinically applying these technologies in advanced therapies and drug screening, or in the bioengineering of disease models. He serves as the Editor-in-Chief of Materials Today Bio (Elsevier). João F. Mano has received numerous honors and awards.



Ali Ahmadi

Dr. Ahmadi is an Associate Professor in the Department of Mechanical Engineering at the École de technologie supérieure (ÉTS) and serves as the co-director of the Biomaterials and Biofabrication Laboratory at the University of Montreal Hospital Research Center in Montreal, Canada. Prior to joining ÉTS in May 2022, he held the position of Associate Professor and Lévesque Research Chair in Nutritional Sciences and Health within the Faculty of Sustainable Design Engineering at the University of Prince Edward Island.

With post-doctoral training and a PhD from the University of British Columbia, Ahmadi's research primarily centers on biofabrication and microfabrication techniques. Additionally, he currently holds the role of Senior Vice-President of the Canadian Society of Mechanical Engineers and has been recognized with various awards, notably the Levesque Distinguished Research Chair and the Engineers PEI Young Engineer of the Year award.



Irem Bayindir-Buchhalter

Irem Bayindir-Buchhalter Molecular Biology and Genetics at the Middle East Technical University, Ankara. She obtained her MSc focusing on the field of embryonic and hematopoietic stem cells jointly at Heidelberg University and the German Cancer Research Center (DKFZ), where she also worked on adipose tissue and metabolism during her PhD. She joined Wiley-VCH in 2016.



**Alix Deymier** 

Dr. Deymier is an Assistant Professor in Biomedical Engineering at the University of Connecticut Health Center. She is interested in elucidating the structure-function mechanisms by which pathological conditions affect the mechanical behavior of musculoskeletal tissues. Current focuses include the effects of acidosis on bone, dentinogenesis imperfecta on teeth, and paralysis on the tendon-to-bone enthesis.

Dr. Alix has a bachelor's degree in Materials Science and Engineering from the University of Arizona and a Ph.D. in the same field from Northwestern University. She completed postdocs in cell and molecular biology and orthopedic surgery at Northwestern University, Washington University in St Louis, and Columbia University. A current awardee of the NSF CAREER grant, Dr. Alix has been at UConn Health since 2017.



**Razieh Farzad** 

Dr. Farzad is an Assistant Professor and Seafood Safety Extension Specialist at the University of Florida. Before joining UF, she was a postdoctoral scholar at the University of California, Davis. Dr. Farzad received her Ph.D. in Food Science and Technology at Virginia Tech, focusing on developing novel aquafeed to address sustainability issues for aquaculture production.

Her current research program is focused on using cellular agriculture techniques to produce novel sources of protein for both fish and humans. Dr. Farzad is dedicated to enhancing seafood safety through research and outreach initiatives, educating stakeholders about best practices, and promoting sustainable seafood consumption.



Jianjun Guan

Dr. Guan is Earl E. & Myrtle E. Walker Professor of Engineering in the Department of Mechanical Engineering and Materials Science at the Washington University in St. Louis. He joined Washington University in August 2018. His research interests are biomaterials, drug delivery, and regenerative medicine.

Specifically, his research is focused on: development of biomimetic elastic polymers; generation of nano-structured scaffolds mimicking biomechanical and structural properties of cardiovascular tissues; injectable, fast gelation, and highly flexible hydrogels for cell and drug therapies; design of novel drugs and their delivery systems to control inflammation, cardiac fibrosis, and cardiac extracellular matrix (ECM) degradation, and to promote fast angiogenesis after myocardial infarction; engineering cardiac patches capable of fast angiogenesis; multifunctional stem cell and drug delivery systems for myocardial, ischemic limb, bone and skin regeneration; development of polymeric, degradable, and imageable electron paramagnetic resonance (EPR) probes and magnetic resonance imaging (MRI) probes for real time oxygen detection in tissues.



**Feng Guo** 

Dr. Feng Guo is an Associated Professor of Intelligent Systems Engineering at Indiana University Bloomington (IUB). Before joining IUB in 2017, he received his Ph.D. in Engineering Science and Mechanics at Penn State and his postdoc training at Stanford University School of Medicine.

His group is developing intelligent medical devices, sensors, and systems with the support of multiple NIH and NSF awards. He is a recipient of the NIH Director's New Innovator Award, the Outstanding Junior Faculty Award at IU, Early Career Award at Penn State, the Dean Postdoctoral Fellowship at Stanford School of Medicine, etc.



Jordane Jasniewski

Dr. Jasniewski completed his Ph.D. in 2008 at I.N.P.L in Biotechnological and Food Processes. Currently, he holds the position of Associate Professor in Physicochemistry and Food Biochemistry at the Laboratory of Biomolecule Engineering (LIBio) at the University of Lorraine.

His research focuses on controlling soft matter to create supramolecular architectures capable of encapsulating molecules of interest. His work particularly involves complex coacervation and nanoprecipitation. One of the approaches employed in his research is enzymatic modification (grafting of phenolic compounds) to guide soft matter towards the spontaneous creation of new objects, such as particles.



Sahar Salehi-Müller

Dr. habil. Salehi-Müller is a leader of the research group "Biomaterials for Tissue Regeneration" at the Department of Biomaterials, University of Bayreuth (UBT), Germany. She received her Bachelor's and Master's degrees in Materials Engineering and Ph.D. in Biomaterials and recently received the title of habilitation from the Faculty of Engineering Science of UBT in the field of Biomaterials. Before starting her current position at the University of Bayreuth in 2017, she worked as a postdoctoral fellow at the German Textile Research Institute (DTNW), the University of Duisburg-Essen in Germany, Japan's World Premier International-Advanced Institute of Materials Research at Tohoku University, Japan.

Her research focuses on biomaterials development and micro/nanoengineering technologies to process the biomaterials for 3D cellular models. She has been the author of more than 60 peer-reviewed articles and the recipient of various awards, such as Sicca 2013, Falling Wall Lab Sendai 2015, IC 2019, Sicca 2022, and FEIT fellowship 2023 from Melbourne University.



Amir Sheikhi

Dr. Sheikhi is the Dorothy Foehr Huck and J. Lloyd Huck Early Career Chair in Biomaterials and Regenerative Engineering and an Assistant Professor of Chemical Engineering (primary) and Biomedical Engineering (by courtesy) at The Pennsylvania State University (Penn State).

In August 2019, he founded the Bio-Soft Materials Laboratory (B-SMaL) to tackle some of the challenges of the 21st century in biomedicine and the environment by designing novel bio-based colloidal systems via micro- and nanoengineering techniques. Amir's lab consists of 13 graduate students, 2 postdocs, and more than 15 undergraduate researchers, funded by NIH, ACS PRF DNI, The REMADE Institute (DOE), Meghan Rose Bradley Foundation, Center for Lignocellulose Structure and Formation (CLSF), Penn State Institutes of Energy and the Environment (IEE), Benkovic Research Initiative, etc. Amir's research has been featured in more than 70 publications, 50 seminars, and 15 patent applications with recognition by over 40 news media outlets. He is the recipient of several major awards, including the AIChE's 35 Under 35, 2022 ACS Unilever Award for Outstanding Young Investigator in Colloid & Surfactant Science, The John C. Chen Young Professional Leadership Scholarship, and The UNIFOR Global Research Fellowship.



Mohammad A. Qasaimeh

Dr. Qasaimeh is an Associate Professor of Mechanical Engineering and Bioengineering at New York University Abu Dhabi (NYUAD), Abu Dhabi, UAE, and a Global Network Associate Professor with the Mechanical and Aerospace Engineering and Biomedical Engineering departments at NYU Tandon School of Engineering. He is also the NYUAD's Engineering Faculty Diversity Liaison since 2021. He received his PhD in Biomedical Engineering from McGill University, Montreal. Prior to joining NYUAD, he was a Postdoctoral Research Associate at Massachusetts Institute of Technology and a Research Fellow at Harvard Medical School. Upon joining NYUAD, he established the Advanced Microfluidics and Microdevices Laboratory (AMMLab).

His current research interests include developing microfluidic and MEMS devices for point-of-care diagnostics, surgery, and biomedical applications. Recently, Dr. Qasaimeh was awarded the Distinguished Service Award from NYUAD in 2022 and the Technology Innovation Pioneers (TIP) Award from the UAE's Ministry of Economy during the TIP 2020 Summit. His research has been published in many peer-reviewed journals, and he delivered more than 45 keynote and invited lectures.



Émilie Velot

Associate Professor Émilie Velot studied Biochemistry and Molecular Biology and did her Master thesis in Biomaterials and Bioengineering at the University Henri Poincaré (Nancy, France). Her PhD was achieved in the Laboratory of Cardiovascular Research of the Public Research Centre for Health (CRP-Santé, Luxembourg). As a Master's student (2004-2005), she investigated chondrocyte differentiation/dedifferentiation and extracellular matrix (ECM) for cartilage tissue engineering. During her PhD (2005-2008), she worked on ECM remodeling following myocardial infarction.

Her research includes adipocyte differentiation and cell proliferation in the context of atherosclerosis, the craniofacial and mandibular morphology of transgenic mice with mostly monosomies and trisomies linked to homologous chromosomes of Hsa21, vascular tissue engineering, stem cells and regenerative pathways through extracellular vesicles, and nanoliposomes for delivery of active molecules in regenerative medicine. She participated in the French Society for Extracellular Vesicles and was re-elected for a 3rd term on the FSEV board (2024). She has also served as the FSEV Newsletter Editor since 2020.

#### **Industry Speaker**



**Emmanuel PJM Everaert** 

Dr. Everaert is currently with Cargill Beauty (6+ years), Global R&D innovation, Principal Scientist Lead, Paris la Defense, Paris, France. He has filed more than 35 Patents, presented at more than 20 International conferences, received 3 Gold (+1 Silver) Ingredient awards, and an Edison Awards 2024 (USA). Spend 4.5 years as Research Fellow at Ashland Global PC R&D (NL). Experienced for 15 Years with Unilever R&D Hair Global Design Center (UK), launched 1200+ Skus for multiple Global Hair brands. He has received his PhD in Biomedical Sciences (Silicone Prostheses).

#### **Industry Speaker**



**Jacob Quint** 

Dr. Quint is a postdoctoral trainee at the University of Connecticut Health Center, a visiting researcher at the University of Minnesota, and the CEO and Co-founder of InPrint Bio, a biomedical research and development start-up. He earned his PhD in Biomedical Engineering from the University of Connecticut and an MSc and BSc in Mechanical Engineering from the University of Nebraska.

His research focuses on the translational deliverv nanofunctionalized biomaterials for tissue regeneration and modeling the tumor microenvironment. He has been awarded numerous fellowships and awards including a T32 Doctoral Fellowship to develop tools to regenerate musculoskeletal tissues and a T90 Postdoctoral Fellowship to fabricate biomaterial-based tumor microenvironments to elucidate spatiotemporal mechanisms underpinning metabolism. From his doctoral research and in collaboration with a diverse team of engineers, regulatory consultants, and clinicians, he cofounded InPrint Bio to translate their technologies toward clinical use. InPrint Bio develops novel biomaterial delivery strategies for academic research and is also actively pursuing preclinical evaluation of its technologies for regulatory approval.

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