Society For Biomaterials

CASE WESTERN RESERVE UNIVERSITY

2023 | BIOMATERIALS DAY

November 10-11, 2023
Wolstein Research Building

CASE WESTERN RESERVE UNIVERSITY

2023 Biomaterials Day Keynote Speaker

Dr. Guillermo A. Ameer Sc.D.

Daniel Hale Williams Professor of Biomedical Engineering,
McCormick School of Engineering

Professor of Surgery, Feinberg School of Medicine

Keynote Speaker

"My Path to Regenerative Engineering and Enabling Clinical Regenerative Medicine"

9:30 am – 10:30 am
Wolstein Auditorium 1413

Dr. Ameer is the Daniel Hale Williams professor of Biomedical Engineering and Surgery in the Biomedical Engineering Department at the McCormick School of Engineering and the Department of Surgery at the Feinberg School of Medicine, Northwestern University. He is the founding director of the Center for Advanced Regenerative Engineering (CARE). Dr. Ameer received his Bachelor's degree in Chemical Engineering from the University of Texas at Austin and his doctoral degree in Chemical and Biomedical Engineering from the Massachusetts Institute of Technology.

Dr. Ameer's research interests include biomaterials, tissue engineering, regenerative engineering, on demand patient-specific medical devices, additive manufacturing for biomedical devices, controlled drug delivery and bio/nanotechnology for improved therapeutics and diagnostics. Dr. Ameer's laboratory pioneered the development and medical applications of citrate-based biomaterials. These materials have been adopted for various bioengineering applications by hundreds of researchers around the world. He has co-authored over 300 peer-reviewed journal publications and conference abstracts, several book chapters, and over 60 patents issued and pending in 9 countries. Several of his patents have been licensed to companies to develop medical products. Dr. Ameer is a member of National Academy of Medicine, a member of American Academy of Arts and Sciences, a Fellow of the American Institute of Medical and Biological Engineering (AIMBE), a Fellow of the Biomedical Engineering Society (BMES), and a Fellow of the American Institute of Chemical Engineers(AIChE). Dr. Ameer is an Associate Editor of the Regenerative Engineering and Translational Medicine Journal, Deputy Editor for Science Advances, member of the Boards of Directors of the Biomedical Engineering Society (BMES), the Regenerative Engineering Society, and the American institute of Medical and Biological Engineering, co-chair of the BMES Diversity Committee, and a member of the Scientific Advisory Board of Acuitive Technologies, Inc. a company that is bringing one of his technologies to the musculoskeletal surgery market. Dr. Ameer is also a co-founder of several medical device companies.

Northwestern | McCORMICK SCHOOL OF ENGINEERING

2023 Biomaterials Day Honorary Speaker

Dr. James M. Anderson MD, PhD

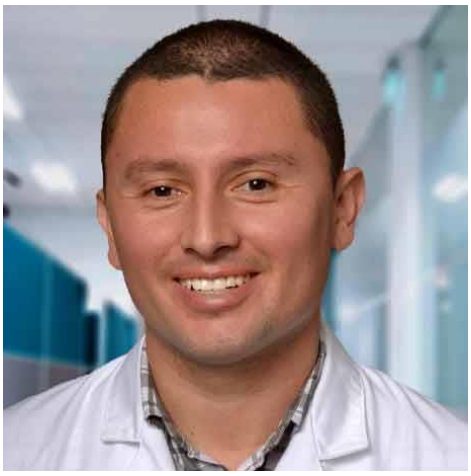
Distinguished University Professor
Professor, Biomedical Engineering

Honorary Speaker

"The Early History of Biomaterials at Case Institute of Technology and Case Western Reserve University"

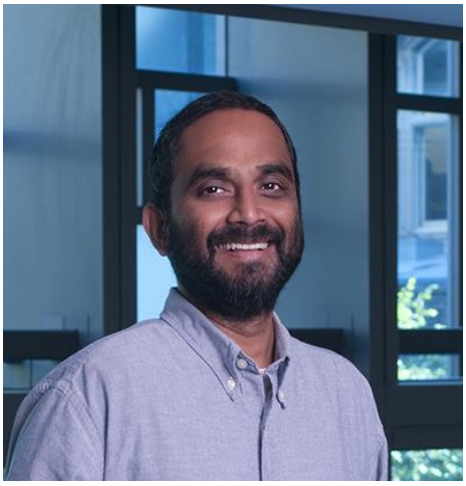
James Anderson is a Distinguished University Professor of pathology at the School of Medicine at CWRU. He has served as a member of the Developmental Therapeutics Program at Case Comprehensive Cancer Center. He also became an elected member of the National Academy of Medicine and the National Academy of Engineering, and served as president of the Society for Biomaterials and the Controlled Release Society. He also received prestigious accolades for his achievements in both medical and engineering research, including the CWRU Frank and Dorothy Hovorka Award for Excellence in Research (2013), an honorary degree from the University of Geneva, the 2005 Elsevier Gold Medal, the 2006 Chugai Mentoring Award from the American Society of Pathology and a Case Western Reserve University School of Medicine Distinguished Alumnus Award in 2007. He is a member of the Association of American Physicians and a fellow of the American Association for the Advancement of Science.

Invited Speakers: Session I – 10:45-11:05am



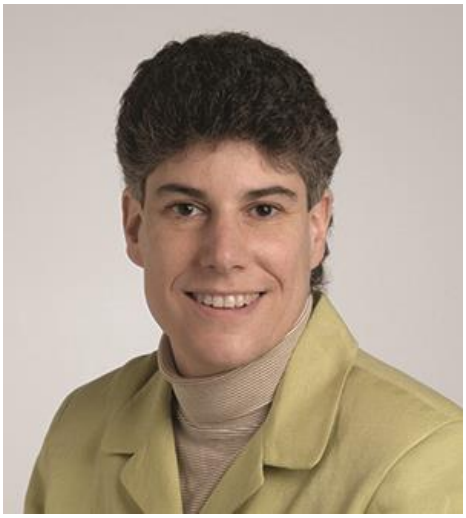
Dr. Daniel Gallego-Perez | The Ohio State University
Session: Biomaterials in Neural Applications
Room: 1233B
Talk Title: Nanotransfection-driven tissue repurposing for therapeutic applications.

Dr. Gallego-Perez's research focuses on the development of novel biomedical micro- and nanoscale technologies for fundamental and translational applications. Major areas of emphasis in his lab include regenerative medicine, cell and tissue reprogramming, drug and gene delivery and cancer research. His laboratory is dedicated to the development and implementation of novel micro-/nanoscale platforms (e.g., Lab-on-Chip devices, gene delivery chips, tissue engineering scaffolds) for applications in fundamental and/or translational medical research.



Dr. Vivek Shenoy | University of Pennsylvania
Session: Immune Modulation and Therapeutics
Room: 1217
Talk Title: Chemo-mechanical Diffusion Waves Orchestrate Collective Dynamics of Immune Cell Podosomes.

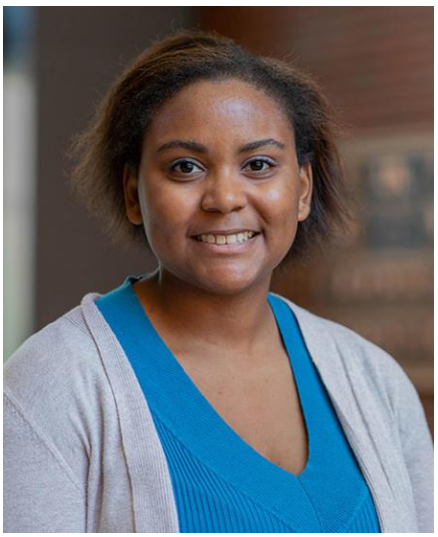
Dr. Shenoy focuses on developing theoretical concepts and numerical methods to understand the basic principles that control the behavior of both engineering and biological systems. A significant challenge in modeling the engineering and biological systems studied is that important processes involve coupling of both small-scale (atomic or single molecule) phenomena and long-range (elastic, electromagnetic) interactions over length scales of hundreds of nanometers. The goal of his work is to address these issues by combining atomic scale simulation methods with continuum or mesoscale theories and by adapting insights from condensed matter physics, solid mechanics, chemistry, materials science and applied mathematics.



Dr. Margot Damaser | Cleveland Clinic
Session: Biomaterials: Biocompatibility and Biomimicry
Room: 2505
Talk Title: Need for translation of new biomaterials in pelvic floor disorders.

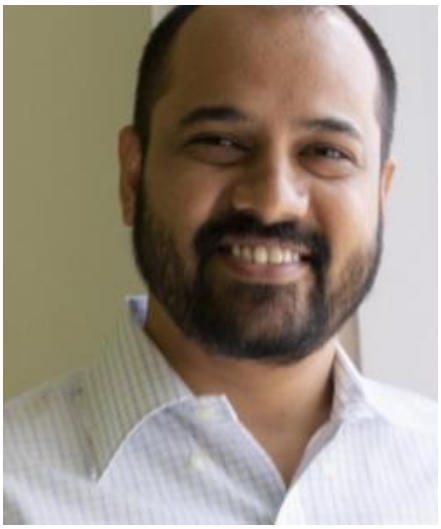
Dr. Damaser uses tools such as wireless communication and integrated circuit design to improve treatments for conditions that are common among the elderly, including stress urinary incontinence (leakage of urine), fecal incontinence (leakage of stool), and pelvic organ prolapse (the genitourinary organs fall out of position in the pelvic region). The lab is also investigating potential treatments to regrow/renew damaged pelvic tissue, including nerves, muscles, and the connective tissue between organs, with the goal of curing these common problems.

Invited Speakers: Session II – 2:55-3:15pm



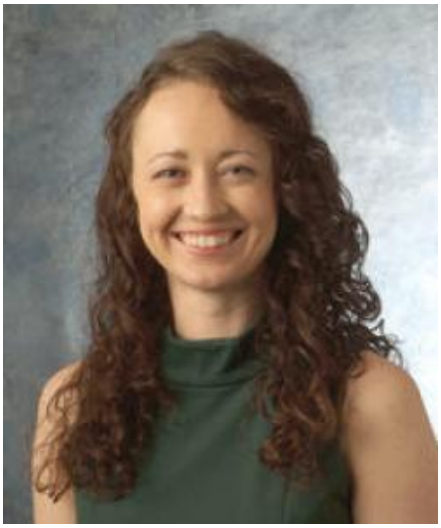
Dr. Brittany Givens Rassoolkhani | University of Kentucky
Session: Biomaterials for Breast and Endometrial Cancer
Room: 2505
Talk Title: The role of biomaterials in reducing endometrial cancer-related health disparities.

Dr. Givens Rassoolkhani's laboratory focuses on developing sustained-release treatments for endometrial cancer. Endometrial cancer has high mortality rates in the United States and very few chemotherapy options. Their goal is to expand the range of effective chemotherapeutic options and access to these. Her lab believes in an approach that solves healthcare problems using scientific advances in the laboratory and in healthcare policy.



Dr. Abhinav Acharya | Case Western Reserve University
Session: Immunotherapy and Inflammation
Room: 1217
Talk Title: Immunometabolism based inverse-vaccines for resolution of inflammation and autoimmune diseases.

Dr. Acharya's laboratory is interesting in developing metabolite-based biomaterials for modulating the function of immune cells by directly controlling their energy metabolism. He has utilized these technologies to generate robust immune responses in mice models of multiple sclerosis (EAE), traumatic brain injury, rheumatoid arthritis, and melanoma.



Dr. Julie Renner | Case Western Reserve University
Session: Biomaterials in Medicine
Room: 1233B
Talk Title: There and Back Again: Polypeptides as an Adventurous Platform for Engineering Surfaces with Applications in Biomaterials, Resource Recovery and Green Energy

The central aim of the Renner Research Group is to develop biomolecular platforms to control solid-liquid interfaces and thin film assemblies. In doing so, we are enabling a new generation of technologies with applications in resource recovery, biomaterials, and energy.

2023 Podium Sessions

Track	Time	Presenter's Name	Room #	University	Title
Biomaterials in Neural Applications	11:05-11:20am	Natalie Mueller	1233B	Case Western Reserve University	Mechanically-adaptive, resveratrol-eluting neural probes record single unit action potentials in vivo
	11:25-11:40am	Dr. Ana Salazar Puerta	1233B	The Ohio State University	Improved Outcomes Following Peripheral Nerve Injury Driven by Tissue Nano-Transfection
	11:45-12:00pm	Danny Lam	1233B	Case Western Reserve University	Development of a Bioresorbable Suture-Based Electrode for Temporary Neuromodulation
Immune Modulation and Therapeutics	11:05-11:20am	Dorian During	1217	Case Western Reserve University	Optimizing Nanobubble Labeling for Tracking CAR-T Cell Distribution in Cancer immunotherapy
	11:25-11:40am	Anubhuti Bhalotia	1217	Case Western Reserve University	Ultrasound-mediated gene therapy: pre-nsitization to cure
	11:45-12:00pm	Abhirami Suresh	1217	Case Western Reserve University	Metabolically activated CAR-Macrophages based therapy as a treatment for lymphoma
Biomaterials: Biocompatibility and Biomimicry	11:05-11:20am	Margaret Cruz	2505	Carnegie Mellon University	Facile extraction of α2 beta casein milk-derived extracellular vesicles can elicit enhanced cell migration in C2C12 murine myoblasts
	11:25-11:40am	Ashbey Manning	2505	University of Kentucky	Influence of emulsion properties on poly(caprolactone) microparticle size
	11:45-12:00pm	Longshun Li	2505	Case Western Reserve University	Platelet-Inspired Drug Delivery Nanoparticle Targets Brain Implanted Microelectrode

Biomaterials for Breast and Endometrial Cancer	3:20-3:35pm	Natalie Chen	2505	University of Michigan	Advanced 3D Bioprintable Ultrasound Responsive Scaffolds to Elucidate Microenvironmental Effects on Breast Cancer Cells.
	3:40-3:55pm	Andrew Choi	2505	Case Western Reserve University	Can targeted nanoparticles distinguish cancer metastasis from inflammation?
	4:00-4:15pm	Aditi Shirke	2505	Case Western Reserve University	Prostate Specific Membrane Antigen Targeted Photodynamic Therapy Agent for the Treatment of Breast Cancer
Immunotherapy and Inflammation	3:20-3:35pm	Taylor Moon	1217	Case Western Reserve University	Nanotechnology & immunotherapy: new best friends
	3:40-3:55pm	Abhirami Thumsi	1217	Case Western Reserve University	Vaccines restore homeostasis in Collagen Induced Arthritis mice
	4:00-4:15pm	Hannah Durr	1217	The University of Akron	Understanding impacts of collagen organization and infection remediation in an infected diabetic wound model treated with a novel oxygenating and antibacterial hydrogel
Biomaterials in Medicine	3:20-3:35pm	Eleanor Plaster	1233B	University of Michigan	DMTMM-mediated synthesis of norbornene-modified hyaluronic acid polymers to probe cell- hydrogel Interactions
	3:40-3:55pm	Yuqian Yang	1233B	University of Michigan	Influence of Stiffness and Cell Density on Chondrocyte Redifferentiation in a Pre-Chondrogenic Stem Cell Niche
	4:00-4:15pm	Dr. Russell Urie	1233B	University of Michigan	Sentinel Biomaterials Identify Transplant Rejection and Prenatal Complications

2023 Poster Sessions – 1:40-2:45pm

Poster #	Presenter's Name		University	Title
1	Rebecca	Ahn	Case Western Reserve University	Polyproline II Helix Peptide Adsorption to Gold and Impact on Fouling Behavior
2	Sogol	Asaei	Case Western Reserve University	Cerium Detection Using Trypsin-Conjugated Calmodulin Loop I Peptide Biosensor
3	Jacob	Brown	The University of Akron	Spheroid-Loaded Decellularized Porcine Myocardial Slices for Cardiac Cell Therapy
4	Anjali	Chiravuri	University of Michigan	Acoustic Droplet Vaporization as a Method of Modulating Hydrogel Microenvironments
5	Jonathan	Duncan	Case Western Reserve University/Louis Stokes Cleveland VA Medical Center	Nanopatterned Surfaces on Microelectrodes Do Not Significantly Improve Recording Performance In Vivo For Acute Implantation
6	Cindy	Jeong	Case Western Reserve University	Multiplex Microfluidic Based Investigation of Haptotaxis on Fibronectin1 to Model Skull Bone Morphogenesis
7	Niveda	Kasthuri	Case Western Reserve University	Spatial Proteomic Analysis of Intracortical Microelectrode Implant Site
8	Kenzington	Kottenbrock	The Ohio State University	Magnetic mapping of bio-inspired clusters of iron oxide nanoparticles
9	Rabina	Lamichhane	The University of Akron	Hybrid Hydrogel-assisted Angiogenic Sprouting of Cell Spheroids
10	Somnath	Maji	University of Michigan	Spatiotemporal control of mesenchymal stem cell differentiation for bone regeneration using focused

				ultrasound-mediated hydrogel stiffening.
11	Prathamesh	Mane	The University of Akron	Tissue adhesive polyester Coacervates and electrospun mats for hemorrhage control application
12	Rea	Marfatia	Case Western Reserve University	Testing for the Presence of Collagen Fibrils via Mechanical Means
13	Greta	Mulbauer	Wayne State University	C2C12 Myoblast Culture in Hyaluronic Acid & dECM-Based Hollow Fibers: A Muscle Fiber Development Platform
14	Aratrika	Pan	The Ohio State University	Collagen Fibril Structure, Charge and Vascular Calcification
15	Sonali	Rohiwal	Case Western Reserve University	Hemostatic Performance Analysis of Stored Whole Blood in an in vitro Human Massive Transfusion Model
16	Rubia	Shaik	The University of Akron	Fabrication of Injectable Granular Hydrogel using Cardiac Extracellular Matrix
17	Si Young	Song	Case Western Reserve University	Qualification of Hemolysis in Dielectric Blood Coagulometry
18	Amman	Spencer	Case Western Reserve University	Optimization of the extruder nanobubble technique
19	Daniel	Verrico	Case Western Reserve University	Encapsulating and immobilizing yeast in PEG microfiber constructs using uniaxial electrospinning methods
20	Jaime	Wang	Case Western Reserve University	Proteomic Analysis of the Inflammatory Response Following Intracortical Microelectrode Implantation

21	Junyan	Yu	The Ohio State University	Designer extracellular vesicles as a non-viral delivery system for neurofibromatosis type 1 (NF1) treatment
22	Wenjin	Zhang	Case Western Reserve University	Fetuin-assisted Intrafibrillar Mineralization of Type I Collagen
23	Vasanti	Dhakate	The University of Akron	Development of polyacrylamide-methacrylated hyaluronic acid hydrogels to model in-vitro CNS injury responses
24	Kylie	Schmitz	Cleveland State University	Material Characterization of Natural Hydrogels for the Development of Nerve Scaffolds in Tissue Regeneration Applications
25	Jon	Stranan	The Ohio State University	Vasculogenic cellular reprogramming for the treatment of Alzheimer's Disease in a transgenic mouse model
26	Kevin	Yang	Case Western Reserve University	Posterior Tibial Nerve Stimulation in Swine Using an Injectable Electrode
29	Prasiddha	Guragain	The University of Akron	A 3D Model of Bone Metastasis of ER+ Breast Cancer
30	Jacob	Heiss	The University of Akron	A 3D Tumor Model to Examine the Effects of the Extracellular Matrix on Cancer Cell Invasion
31	Astha	Lamichhane	The University of Akron	An Organotypic Model of Patient-derived Colorectal Tumor
32	Lauren	Mehanna	University of Kentucky	Effect of Paclitaxel Loaded Poly(caprolactone) Nanoparticles on Endometrial Cancer Cell Migration
33	Pouria	Rafsanjani Nejad	The University of Akron	A GRAVITY-DRIVEN MULTI MICRO PHYSIOLOGICAL SYSTEM TO STUDY TISSUE RESPONSES TO CANCER THERAPEUTICS

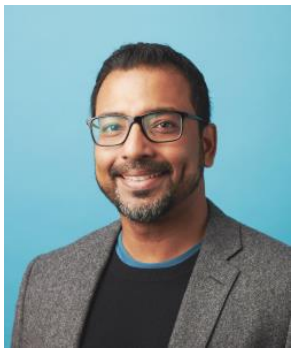
34	Anju	Rana Magar	The University of Akron	MECHANO-BIOLOGICAL EFFECTS OF THE EXTRACELLULAR MATRIX ON BREAST TUMOR CELL INVASION
35	Jordan	Berezowitz	University of Kentucky	Copper Oxide as an Anti-Neoplastic Agent in Endometrial Carcinoma
36	Hannah	Combs	The University of Akron	Asymmetric Neonate Lung Model to Study Surfactant Transport in the Airways
37	Yiwen	Gao	Case Western Reserve University	Development of a Crosslinked Protein-Based Microgel Delivery System for Cardiac Tissue Regeneration
38	Davonn	Henderson	The University of Akron	The Fabrication of a Breathing Neonate Lung Model
39	Keren	Hu	Case Western Reserve University	Bio-responsive Nanomedicine for Targeted Inhibition of NETosis in Treating Deep Vein Thrombosis
40	Taravat	Khodaei	Case Western Reserve University	Succinate based particles for cancer immunotherapy
41	Jenny	Lian	Case Western Reserve University	Evaluation of Hemostatic Properties of Procoagulant Synthetic Platelets
42	Sabine	Meurs	University of Michigan	3D Bioprintable GelMA Ultrasound Responsive Scaffolds for Precise Micropatterning and Spatiotemporal Drug Release
43	Mali Ya Mungu	Ocoko	Case Western Reserve University	Development of Patterning and Transfer Processes for Integrating Annealed Titanium Nanotube Array Microsegments onto Polymer Substrates
44	Stephen	Piatkowski	The Ohio State University	Delivering angiogenic transcrip0on factor genes to treat ischemic stroke via myeloid-derived suppressor cells

45	Abigail; Danielle	Roeckmann; Sun	Case Western Reserve University	Bio-inspired hemostatic liposomes for targeted delivery of thrombin
46	Claire	Rowlands	University of Kentucky	Paclitaxel Loaded Polycaprolactone Particles for Treating Endometrial Cancer
47	Katarina	Sikiric	The Ohio State University	N/A
48	Bhummanat	Sittipongpittaya	Case Western Reserve University	Platelet-Inspired Targeting of Triple-Negative Breast Cancer with CD44 & Gal-3 Binding Peptide: A6 & G3-C12
49	Eric	Trout	Case Western Reserve University	Release of Doxycycline from Cyclodextrin Loaded Collagen Hydrogels
50	Hanyang	Wang	Case Western Reserve University	Nanoparticle-Based Drug Delivery for the Degradation of Recalcitrant Blood Clots
51	HAIJUN	XIAO	University of Michigan	Ultrasound Influence on Fibrin Gel Degradation and Dextran Release: Implications for Controlled Delivery Systems

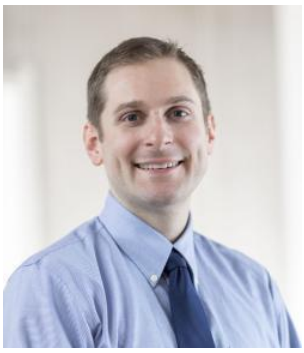
2023 Biomaterials Day Industry Panel – 12:05-12:20pm

- Dr. Nathan Rohner – Lubrizol
- Emily Szabo – NeuronOff
- Dr. Michael Bruckman - Haima Therapeutics
- Dr. Christa Pawlowski - Haima Therapeutics
- Baylee Taylor - Haima Therapeutics
- Emma Quill - Haima Therapeutics
- Dr. Subba Shankar – CollaMedix Inc.
- Dr. Christian Denny - CollaMedix Inc.
- Michael Mastran - CollaMedix Inc.
- Eloise Jensen – Steris
- Carmen Goodwin - Steris

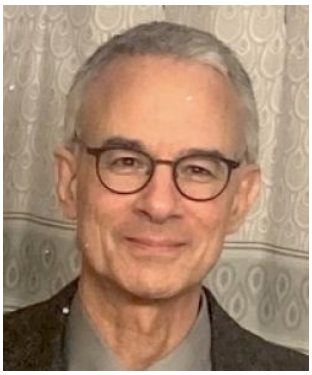
2023 Biomaterials Day CWRU Faculty Advisers



Anirban Sen Gupta, PhD
Professor, Department of Biomedical Engineering, Case School of Engineering, School of Medicine
Member, Cancer Imaging Program, Case Comprehensive Cancer Center



Andrew Shoffstall, PhD
Assistant Professor, Department of Biomedical Engineering, Case School of Engineering, School of Medicine



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