USING BIOMATERIALS TO CREATE IN VIVO–LIKE ENVIRONMENTS FOR STUDYING INHERITED DISEASE

BIOMATERIALS FORUM

OFFICIAL NEWSLETTER OF THE SOCIETY FOR BIOMATERIALS

THIRD QUARTER 2024 • VOLUME 46, ISSUE 3

ALSO INSIDE

SFB 2025 AWARD WINNERS

Biomaterials Forum, the official news magazine of the Society For Biomaterials, is published quarterly to serve the biomaterials community. Society members receive *Biomaterials Forum* as a benefit of membership. Non-members may subscribe to the magazine at the annual rate of $48. For subscription information or membership inquiries, contact the Membership Department at the Society office (email: info@biomaterials.org) or visit the Society's website, biomaterials.org.

Editorial contributions to *Biomaterials Forum* are always welcome. Contributions should be sent to the Executive Editor and are subject to the terms and conditions of the Editorial and Publication Release. Authors should refer to the Author Guidelines, which are available on the Society's website, when writing submissions. The publisher accepts no responsibility for return or safety of artwork, photographs or manuscripts. Submission of editorial content does not guarantee acceptance or publication.

Address corrections should be sent to *Biomaterials Forum*, 1120 Route 73, Suite 200, Mt. Laurel, NJ 08054.

Requests for advertising information should be directed to Meg Ryan at mmryan@ahint.com or 856-380-6850. Information is also available on the Society's website, biomaterials.org.

Scientific photos may be submitted for cover consideration in future issues. Submit color photo, no larger than 4" x 6", along with credit information and scientific description, to the Executive Editor.

BIOMATERIALS FORUM

The official news magazine of the **SOCIETY FOR BIOMATERIALS** • Volume 46, Issue 3

SPECIAL INTEREST GROUP REPORTERS

BioInterfaces	TBD
Biomaterials & Medical Products Commercialization	Subramanian Gunasekaran • guna@encoll.com
Biomaterials Education	Jeremy Mercuri • jmercur@g.clemson.edu
Biomaterial-Tissue Interaction	Patrick L. McGee • patrickmcgee.dds@outlook.com
Cardiovascular Biomaterials	Astha Khanna • akhanna@gravertech.com
Dental/Craniofacial Biomaterials	TBD
Drug Delivery	Eun Ji Chung • eunchung@usc.edu
Engineering Cells & Their Microenvironments	Silviya Zustiak • silviya.zustiak@slu.edu
Immune Engineering	Yaoying Wu • yw195@duke.edu
Nanomaterials	Mahboubeh Nabavinia • NABAVINIAM20@ecu.edu
Ophthalmic Biomaterials	Frances Lasowski • lasowsfj@mcmaster.ca
Orthopaedic Biomaterials	Roche C. de Guzman • roche.c.deguzman@hosftra.edu
Surface Characterization & Modifications	TBD
Tissue Engineering	Jessica M. Gluck • jmgluck@ncsu.edu

If interested in filling a vacancy above, please reach out to your SIG Chair.
Contact information can be found on individual SIG pages as found **here**.

ON THE COVER

Confocal cross section of microengineered heart tissue (μEHT) derived from human induced pluripotent stem cells. Heart muscle cells (cardiomyocytes) are stained for sarcomere proteins alpha-actinin-2 (in red) and myosin binding protein-C (in green). The nuclei (in blue) provide insight into cell distribution, highlighting the interconnection of cells within the aligned tissue. Image credit: Ghiska Ramahdita, PhD student and McDonnell International Scholars Academy Fellow, Huebsch Lab, Washington University in St. Louis.

Contents

THE TORCH

NEWS & UPDATES

FEATURES

From the Editor

By Roger Narayan, MD, PhD, Biomaterials Forum Executive Editor

It is my great pleasure to share this issue of the Biomaterials Forum, which includes recent trends in the field of biomaterials science and the achievements of our Society's members.

The cover image highlights recent work on microengineered heart tissue from Professor Nathaniel Huebsch's lab at the Washington University in St. Louis.

President Sarah E. Stabenfeldt's letter highlights the success of the 2024 Regional Symposia and the preparations for our 50th anniversary meeting in Chicago, where the society will celebrate half a century of innovation and achievements. This issue also highlights the announcement of the inaugural class of the AIMBE Emerging Leaders in Medical and Biological Engineering (MBE). The awardees, who were selected based on their distinguished achievements, will take part in a three-year mentorship program to further their professional development. The issue also highlights the achievements of the 2025 awards, which recognize outstanding research, education and outreach achievements in the biomaterials field.

In our feature article, Professor Huebsch at the Washington University in St. Louis highlights pioneering work that was carried out in his department, including work by Elliot Elson related to biomechanical testing and cardiovascular tissue engineering. The feature article also describes current efforts by Professor Huebsch involving magnetorheological elastomers, alginate hydrogels grafted with peptide mimics of growth factors and "tissue-on-a-chip" disease models.

In the Government News section, Carl Simon describes the Trump administration's priorities to enhance access to telehealth to tackle healthcare shortages, reduce drug prices via market-based solutions and streamline the approval process for generic drugs. The Industry News section highlights recent developments in the medical device industry, including company performance, mergers, and FDA approvals.

This issue underscores how SFB members in academia, government and industry are supporting advances in the biomaterials field for the benefit of patients.

As always, please do not hesitate to contact me at roger_narayan@ncsu.edu if you are able to share an image, article, or news event for publication in an upcoming issue.

Yours truly,
Roger Narayan
Editor, Biomaterials Forum

If you have any questions,

require any information or have suggestions for improved services, please feel free to contact the Society's Headquarters office:

SOCIETY FOR BIOMATERIALS
1120 Route 73, Suite 200 • Mount Laurel, NJ 08054
Phone: 856-439-0826 • Fax: 856-439-0525
Email: info@biomaterials.org

From the President

By Sarah Stabenfeldt, SFB President

Dear SFB Members,

My heart is full of biomaterials knowledge and connections after the SFB Regional Symposia in September 2024. I want to recognize and thank our members who led this effort, specifically the National Symposia Chair, Dr. Anita Shukla (Brown University), and the following regional chairs:

- Northeastern Region: Drs. Ambika Bajpayee and Abigail Koppes (Northeastern University)
- Midwestern Region: Drs. Steven Eppell and Anirban Sen Gupta (Case Western Reserve University)
- Southeastern Region: Drs. Edward A. Botchwey and Ankur Singh (Georgia Institute of Technology)
- Southwest Region: Drs. Stephanie Seidlits and Janet Zoldan (University of Texas at Austin)
- Western Region: Drs. Nikki Farnsworth (Colorado School of Mines) and Chelsea Magin (University of Colorado Denver | Anschutz)
- Northwestern Region: Drs. Cole DeForest and Jenny Robinson (University of Washington)

I've had many members reach out to convey the success of these regional events, providing an opportunity to share our research and strengthen or develop new research collaborations. Cheers to all who contributed, organized, presented and attended.

We are now in full planning mode for the 2025 Annual SFB meeting in Chicago, April 9–12, 2025. This meeting is our 50th anniversary meeting, where we will celebrate the past and current accomplishments of SFB with the theme Half a Century of Progress: Crafting Resilience in Mind & Matter! The meeting's program chairs are Drs. Natalie Artzi (Harvard School of Medicine) and Kaitlyn Sadtler (NIH–NIBIB). The leadership from these co-chairs will deliver an innovative and impactful meeting that you will not want to miss. I look forward to meeting folks in Chicago!

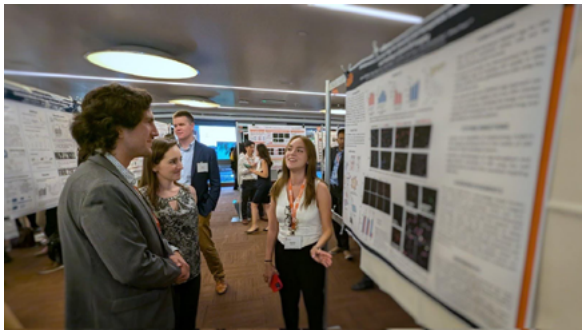
All the best,

Sarah E. Stabenfeldt, PhD
Professor of Biomedical Engineering, Arizona State University
President of Society For Biomaterials

Student attendees of the Midwestern Regional Symposium. ***Photo credit: Andrew Gotschall***

Southeast Regional Symposium attendees gathered to mingle and network. ***Photo credit: Ankur Singh***

Dr. Elazer Edelman presented his plenary talk at the Northeastern Regional Symposium. ***Photo credit: Abigail Koppes***



Poster presentations in full swing at the Southwest Regional Symposium. ***Photo credit: Wilson Poon***

The Western Regional Symposium enjoying day one of this two-day event. ***Photo credit: Chelsea Magin***

AIMBE Emerging Leaders Inaugural Class

The American Institute for Medical and Biological Engineering (AIMBE) recently announced the selection of 17 exceptional professionals as the inaugural class of Emerging Leaders in Medical and Biological Engineering (MBE). Participants in this three-year program will be paired with AIMBE Fellow mentors, who will offer them guidance and opportunities to build connections with leaders in the field. Emerging Leaders will attend at least one AIMBE Annual Event during their program to network with Fellows and further their professional development.

The Emerging Leaders were chosen for their distinguished achievements in MBE and their potential to advance biomedical innovation. They will be formally recognized during AIMBE's Annual Meeting, March 29–31, 2025, in Washington, D.C.

Congratulations to SFB members who were among the 17 selected:

Brian Aguado – University of California, San Diego

Olukemi Akintewe – University of South Florida

Jamel Ali – Florida A&M University – Florida State University

Tania Betancourt – Texas State University

Brooke Coley – Arizona State University

Francisco Contijoch – University of California San Diego

Hugo Giambini – University of Texas at San Antonio

Cheryl Gomillion – University of Georgia

Elizabeth Wayne – University of Washington

Manuel Hernandez – University of Illinois Urbana-Champaign

Mariana Kersh – University of Illinois Urbana-Champaign

Kristin Morgan – University of Connecticut

Amy Orsborn – University of Washington

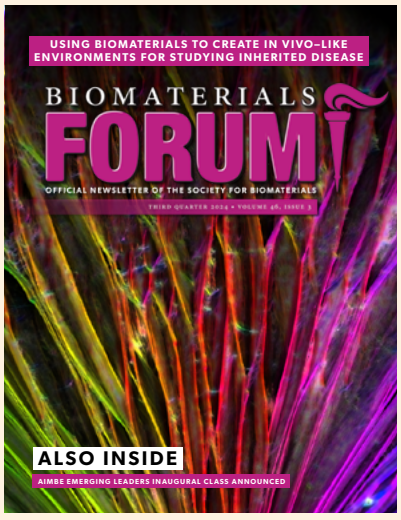
Darwin Reyes – National Institute of Standards and Technology

Gabriela Romero Uribe – University of Texas at San Antonio

Gelsy Torres-Oviedo – University of Pittsburgh

Joseph Towles – Swarthmore College

CALL FOR COVER ART



WE WANT TO FEATURE YOUR EXCITING BIOMATERIALS ARTWORK ON THE COVER OF *BIOMATERIALS FORUM!*

Deadline: Accepted on a rolling basis.

Instructions: Please email artwork (digital images, artistic creations, etc.) to info@biomaterials.org, to the attention of the Executive Editor of the *Biomaterials Forum*. All artwork with biomaterials relevance that have not appeared as a *Forum* cover are welcome. Multiple submissions are permissible.

Description: Selected artwork will appear as the cover of a future issue of *Biomaterials Forum* along with a brief "On the Cover" description of the subject and name/affiliation of the creator.

Format: High-resolution electronic version in .gif, .tiff or .jpeg file format.

2025 Award Recipients Announced

The Society proudly announced the 2025 Award Winners on Feb. 12, 2025. These prestigious industry awards recognize outstanding achievement and contributions to the biomaterials field.

Nicholas P. Ziats, PhD, Case Western Reserve University, received this year's Founders Award. This is presented to an individual who has made a long-term, landmark contribution to the biomaterials discipline.

"It is important to recognize the breadth of Nick's work covering many disciplines including cell biology, immunology, cancer, heart disease, neural disease and wound healing, and how his studies, along with his many colleagues and collaborators (including myself), have impacted the field of biomaterials at the local, regional, national and international levels," said James M. Anderson, MD, PhD, Case Western Reserve University. "I want to especially highlight that his service to the Society is exemplary and his contributions to the biomaterials community through service to national and local groups has been outstanding."

Jennifer E. Woodell-May, PhD, Zimmer Biomet, was presented with the C. William Hall Award, honoring an industry and government member of the Society For Biomaterials who has made a significant contribution to the Society and has an outstanding record in establishing, developing, maintaining and promoting SFB's objectives and goals.

"The quality and significance of Dr. Woodell-May's impact on the field of biomaterials science and engineering and its professional Society, SFB, is unique and truly exemplary," said Martine LaBerge, PhD, Clemson University. "She embodies the spirit of the C. William Hall Award through unparalleled contributions, leadership and a legacy that will continue to influence the field of biomaterials as the pillar for the medical device industry for years to come."

Shelly E. Sakiyama-Elbert, PhD, University of Washington, received the Society For Biomaterials Award for Service. This award honors significant service to SFB.

"Dr. Sakiyama-Elbert has provided exemplary service to SFB for over 20 years, continuously elevating our community through numerous high-impact roles," said Ankur Singh, PhD, Georgia Institute of Technology. "She has dedicated countless hours to service and advocacy, consistently bridging academia, industry and professional organizations with remarkable effectiveness and vision. She has served as SFB President, Council Member and chair of multiple committees, demonstrating steadfast dedication to the Society's success and strategic growth."

Ashutosh Chilkoti, PhD, Duke University, was presented with the Technology Innovation and Development Award for his pioneering work in developing advanced non-fouling surface coatings based on surface-initiated polymerization and applying them to protein microarrays. This award recognizes an individual's or a team's successful application of basic and applied biomaterials research in the development of a novel medical product or technology that significantly benefits the health and well-being of medical and surgical patients.

Chilkoti has spun off these surfaces into a company aimed at commercialization and new diagnostic devices. He has also developed simple methods to micro- and nano-pattern proteins and DNA on surfaces, and he has developed label-free plasmonic biosensors. He is the founder of five start-up companies, one of which went public, and two that have been acquired. He has co-authored over 360 publications that have almost 49,000 citations to date and has an h-index of 116. He has 40 patents awarded and more than 60 applications pending.

"A driver in Dr. Chilkoti's work is getting his ideas and developments to patients through commercialization," said Buddy Ratner, PhD, University of Washington. "He may hold the 'world effectiveness record' for low amounts of protein on protein-resistant surfaces."

The 2025 Diversity, Equity and Inclusion Award went to the **BME UNITE Future Faculty Program** for its achievements in promoting anti-racism and creating a more diverse, equitable and inclusive environment for historically excluded groups in the STEM disciplines, especially in the field of biomaterials. The program serves any postdoctoral fellow with historically underrepresented identity who is interested in pursuing a faculty position within biomedical engineering or bioengineering.

"The program has supported and amplified numerous individuals with Black/African-American, LatinX/Hispanic, queer and disabled identities to ensure these individuals make a successful transition from postdoctoral fellow to faculty member," said Kelly R. Stevens, PhD, University of Washington.

Ke Cheng, PhD, Columbia University, received the Clemson Award for Applied Research, given to individuals whose accomplishments include significant utilization or application of basic knowledge in science to achieve a specific goal in the field of biomaterials.

2025 Award Recipients Announced (Continued)

"Dr. Cheng is an accomplished innovator, holding 24 U.S. patents and 18 foreign patents, with 11 of these patents licensed to five biotech companies. His groundbreaking technologies have led to four products/technologies entering clinical trials," said Gordana Vunjak-Novakovic, PhD, Columbia.

Cheng is the cofounder of Xsome Biotech, Xollent Biotech, and BreStem Therapeutics, and licensees of his inventions include Capricor Therapeutics and Selsym Biotech. Cheng has authored over 200 peer-reviewed articles in top-tier journals, including The Lancet, Nature Nanotechnology, Nature Materials, Nature Biomedical Engineering and Science Translational Medicine. He has also been recognized as one of Clarivate's Highly Cited Researchers.

Kara Spiller, PhD, Drexel University, is the 2025 recipient of the Clemson Award for Basic Research. This is awarded to an individual who has made an original contribution to the basic knowledge and understanding of the interaction between materials and tissue.

"One growing area of research that Dr. Spiller started is the sequential delivery of different immunomodulatory cytokines to harness sequential and synergistic behavior of infiltrating macrophages," said Elizabeth Cosgriff-Hernandez, PhD, University of Texas at Austin. "Her landmark paper introducing this idea was published in 2015 and has now been cited more than 700 times. A recent Google search for 'sequential delivery of immunomodulatory cytokines' since 2015 yielded 460 results. Yet another example of the impact of the basic research coming from her lab is the demonstration that macrophages can be loaded with drug-releasing micro- or nanoparticles to control their phenotype in situ. This is a completely novel approach to macrophage cell therapy with wide-ranging applications from cancer to autoimmune disease and regenerative medicine."

Jeremy L. Gilbert, PhD, Clemson University, received the Clemson Award for Contributions to the Literature, awarded to an individual who has made a significant contribution to the literature on the science or technology of biomaterials. Gilbert's scholarship portfolio includes 211 peer-reviewed manuscripts, 18 book chapters and 330 conference proceedings. His work has been cited more than 13,400 times, according to Google Scholar, with an h-index of 58.

"Dr. Gilbert has led the field in advancing fundamental knowledge related to surface degradation mechanisms of passive oxide film covered alloys, publishing widely in both the biomaterials literature and the corrosion and tribology literature," said Martine LaBerge, PhD, Clemson University. "Overall, he has made seminal contributions to the study of metallic biomaterials, their application in orthopedics, the interaction of metallic biomaterials with the biological environment, cell-metal surface interactions, degradation mechanisms (corrosion and tribocorrosion) in metallic biomaterials, the study of electrochemical control of metallic biomaterials for diagnostic and therapeutic purposes including cancer therapy and infection control."

Cole A. DeForest, PhD, University of Washington, was awarded the Mid-Career Award, recognizing an individual SFB member who has demonstrated outstanding achievements in or contributions to the field of biomaterials research.

"Cole is creating the biomaterials of the future," Ratner said. "His groundbreaking research integrates engineered biomaterials design with materials science, synthetic chemistry, protein engineering and cell biology to create and exploit next-generation biomaterials addressing health-related problems. His biomaterials are, in fact, exceptionally smart biomaterials."

In addition to research, DeForest has been passionate in biomaterials education and promotion in academia and to the general public.

Brian Aguado, PhD, University of California San Diego, is the 2025 recipient of the Young Investigator Award, recognizing an individual who has demonstrated outstanding achievements in the field of biomaterials research. Aguado has interdisciplinary research interests aimed to resolve sex-based health disparities using biomaterials tools to understand sex differences in biology. He uses his interdisciplinary training in polymer chemistry, sex chromosome biology and bioinformatics to solve pressing questions in sex-specific biology and precision medicine for cardiovascular disease.

"Dr. Aguado seeks to address disparities that impact vulnerable populations experiencing cardiovascular disease both through his mentorship and research. Specifically, he uses biorthogonal chemistry to engineer hydrogel-based cell culture systems that recapitulate the extracellular matrix for a wide array of applications," said Karen Christman, PhD, University of California San Diego.

Nghia Le Ba Thai, Syracuse University, received the Student Award for Outstanding Research, PhD Category, for outstanding achievement in biomaterials research. "He has been highly

2025 Award Recipients Announced (Continued)

productive, with one published first-author paper as a PhD student related to the chitosan-based materials," said Mary Beth Browning Monroe, PhD, Syracuse University. "After completing that work, Nghia independently refined his material system to improve degradability and cell interactions, resulting in his second first-author publication as a PhD student."

Nghia's work provides a unique approach to fabricate cell-laden hydrogel foams with consistent cell density throughout large hydrogel volumes. Due to the porous nature of the foams, encapsulated cells have high viability over long culture time frames. Nghia designed the system for use in chronic wound healing, but it could be broadly employed in any application wherein cell delivery within a scaffold is required, including Crohn's fistulas or cartilage replacement.

Benjamin Nachod, University of Pennsylvania, received the William Hall Undergraduate Travel Scholarship, named in memory of the Society's first president, Dr. C. William Hall.

Milani Needam, North Carolina A&T State University, was awarded the Cato T. Laurencin Undergraduate Travel Fellowship, named in honor of a distinguished member of the Society For Biomaterials and dedicated to supporting undergraduate students of underrepresented minorities in the field of biomaterials to attend the 2025 Annual Meeting & Exposition

.

ATTENTION MEMBERS!

WE WOULD LOVE TO HEAR FROM YOU.

IF YOU HAVE NEWS TO SHARE WITH FORUM READERS, LET US KNOW. EMAIL YOUR NEWS AND ANY PHOTOS TO INFO@BIOMATERIALS.ORG AND YOU COULD BE FEATURED IN THE NEXT ISSUE.

Using Biomaterials to Create In Vivo-Like Environments for Studying Inherited Disease

By Nathaniel Huebsch

To paraphrase J.R.R. Tolkien, "The tapestry is greater than, and cannot be explained by, the sum of its component threads." This concept beautifully encapsulates how both cells and tissues display emergent properties that are challenging to explain simply by summing up the function of their combined parts.

Historically, this has presented challenges to experimentalists, because they have lacked appropriate technology to analyze these complex systems. Elliot Elson, a pioneer in the fields of mechanobiology and fluorescence microscopy, invented several key technologies during his tenure at Washington University in St. Louis, which began in 1979. These technologies include the cell poker, a precursor to current nanoindentation approaches, which allowed Elson and his team to spatially map stiffness of fibroblasts and to delineate how this changed with cytoskeletal disruption (Peterson et al. PNAS 1982).

Another key invention from Elson's lab was engineered heart tissue (Eschenhagen et al. FASEB J. 1997). By gently isolating cardiomyocytes from chick embryos and encapsulating them into a collagen matrix cultured under mechanical stress, Elson and his team were able to form heart muscle in a dish. Although artificially assembled from cells, engineered heart muscle mimicked many of the physiological and pharmacological properties of natural heart tissue.

Inspired by pioneering work done at WashU by Elson and other leaders in tissue engineering, including several of his own scientific mentors, Herman Vandenburgh, David Mooney and Kevin Healy, I have based much of my work at WashU on using engineered tissue as a platform for basic discovery. Advancements in stem cell research now allow us to generate cardiomyocytes from human-induced pluripotent stem cells (iPSC) in the lab, enabling studies on genetically inherited diseases.

Since my postdoctoral training and after starting my lab at WashU in 2018, my team and I have leveraged biomaterials to control mechanical stresses the tissues experience. The heart muscles form on soft silicone rubber (PDMS) substrates chemically grafted with extracellular matrix, and every time the muscle contracts, it must work mechanically against the PDMS. Tuning that mechanical stress, or the shape of the tissue itself, can push these human tissues to show mature ion channel function (Simmons et al. APL Bioeng. 2024) and can unveil physiology and structural hallmarks of genetically inherited diseases like hypertrophic cardiomyopathy (Guo et al. iScience 2024). The team has also leveraged magnetorheological elastomers as substrates so that mechanical stress can be tuned in situ with magnetic fields (Schuftan et al. J Biomed Mater Res. A 2024). They are now applying these biomaterial systems to the signaling pathways that link mechanical cues to cardiomyocyte hypertrophy and pathologic contractility in hypertrophic cardiomyopathy. My team collaborates with Elson and several teams from engineering (Guy Genin and Jon Silva) and cardiology (Michael Greenberg, Sharon Cresci, Kory Lavine, Stacey Rentschler and Abhinav Diwan) in these studies.

Besides leveraging biomaterials to study how inherited diseases develop, my team and I also use biomaterials to treat disease and injury. Our current regenerative medicine focus is in using alginate hydrogels grafted with peptide mimics of growth factors that influence mesenchymal stem cell differentiation along with the anti-inflammatory properties of these cells (Tan et al. BioRxiv 2024). Through collaboration with Drs. Lori Setton and Simon Tang, my team is investigating how these peptide-modified gels affect musculoskeletal tissue repair. A long-term goal of my team is to leverage our "tissue-on-a-chip" disease models to test potential therapeutic mechanisms of action for the hydrogel materials and peptides we are developing. I am excited to continue to grow my research program and work with the many experts in biomaterials, tissue and cellular engineering, including Drs. Farshid Guilak, Cory Berkland, Xiaowei Li, Jianjun Guan, Amit Pathak and Alexandra Rutz.

Photo of the acellular tissue engineered vessel taken by Carl Simon during happy hour at the Gordon Research Conference on Advanced Cell & Tissue Biomanufacturing in June 2023 in Newry, Maine. An employee from Humacyte brought the sample to the meeting for display. Note product packaging on the table and behind the vessel. The vessel is the opaque tubular structure in the middle of the image with plastic wrapping behind it. The graft feels like calamari when grasped: slippery, moist and soft.

Government News

HOW MIGHT GOVERNMENT CHANGES IMPACT THE HEALTHCARE INDUSTRY? PART 2

By Carl G. Simon, Jr., PhD

The new Trump administration has made widespread changes and tested longstanding organizations across offices of finance, education, social services and, not insignificantly, healthcare. The White House has sought cutbacks in research, disease control and prevention, and other areas that may directly impact our field.

One of the Forum's objectives is to keep SFB members abreast of the technology and development in biomaterial science; as such, it is important to remain on top of the governmental changes that may impact the healthcare industry in general.

We shared several areas of interest in the Forum's Q2 2024 issue; here we continue the list. While the numerous proposed changes have come in rapid succession and may change quickly, these are some of the developments in the new administration's direction affecting the U.S. healthcare landscape as of February 2025.

1. FOCUS ON TELEMEDICINE AND DIGITAL HEALTH

Telemedicine has become a focal point for the new administration, which continues its efforts to expand digital health services. The regulatory environment around telehealth has been relaxed, allowing more patients to access care remotely without requiring in-person visits. The goal is to enhance access to healthcare, especially in rural areas where specialists are limited.

THE ADMINISTRATION SEES TELEMEDICINE AS A KEY TOOL FOR ADDRESSING HEALTHCARE SHORTAGES AND MODERNIZING THE U.S. HEALTHCARE SYSTEM

The administration sees telemedicine as a key tool for addressing healthcare shortages and modernizing the U.S. healthcare system. This shift is expected to improve access to care, particularly in underserved communities, and drive innovation in healthcare delivery.

2. DRUG PRICING REFORMS

Addressing the high cost of prescription drugs remains a top priority for the new government. The administration has taken steps to reduce drug prices by promoting market-based solutions, such as increasing competition within the pharmaceutical industry and advocating for more transparency in drug pricing.

Efforts are also under way to streamline the approval process for generic drugs and reduce the influence of intermediaries, such as pharmacy benefit managers (PBMs), a role that has been criticized for driving up drug costs. The new administration has said the aim of these reforms is to provide consumers with more affordable options for their medications.

WHAT DOES IT MEAN TO US?

These shifts raise important questions about access to care, insurance affordability and the long-term implications for vulnerable populations. The success or failure of these reforms will shape the future of healthcare in the United States and determine how well it serves the diverse needs of its population.

ATTENTION MEMBERS!

WE WOULD LOVE TO HEAR FROM YOU.

IF YOU HAVE NEWS TO SHARE WITH FORUM READERS, LET US KNOW. EMAIL YOUR NEWS AND ANY PHOTOS TO INFO@BIOMATERIALS.ORG AND YOU COULD BE FEATURED IN THE NEXT ISSUE.

Q3 2024 Industry News

Developments and technical advances in biomaterials continued to increase in the third quarter of 2024, while national gatherings brought together researchers to discuss the latest advancements and medical applications.

BIOMATERIAL TECHNOLOGY DEVELOPMENTS

Society For Biomaterials (SFB) 2024 Regional Symposia: From Sept. 19-20, 2024, the SFB hosted regional symposia across the United States, including locations such as Northeastern University and the University of Texas at Austin. These gatherings brought together professionals to discuss the latest research and applications in biomaterials science.
Source: BIOMATERIALS

3DHEALS Biomaterials 2024 Virtual Event: On Sept. 5, 2024, the 3DHEALS Biomaterials 2024 virtual event focused on advancements in biomaterials and material science for 3D printing implants, medical devices and biofabrication. The event featured experts discussing novel materials, fabrication techniques and biofunctionalization strategies tailored for medical applications.
Source: 3DHEALS

Regenerative Medicine Highlights: In the July to September 2024 issues of Regenerative Medicine, several articles explored personalized regenerative implants. These implants aim to advance regenerative medicine through tailored approaches, serving as scaffolds for tissue repair and regeneration. The studies emphasized patient-centered research and care, highlighting the importance of considering the impact on patients' quality of life.
Source: REGMEDNET

Emerging Trends in Biomaterials: A report from CAS Insights identified the rise of biomaterials as a significant trend in 2024. This includes the development of new materials and technologies with applications in various fields, including medicine. The report highlights the accelerated expansion of green chemistry and the clinical validation of CRISPR as related advancements.
Source: CAS

HEALTHCARE FINANCIAL PERFORMANCE

Tenet Healthcare: Experienced a 3.4 percent revenue decline due to hospital divestitures.

Cardinal Health: Saw a 9 percent revenue increase to $54.9 billion, with a 10 percent rise in earnings.

Hims & Hers Health: Achieved 77 percent year-over-year revenue growth, totaling $401.6 million.

HCA Healthcare: Reported a rise in Adjusted EBITDA from $2.88 billion to $3.27 billion.

HEALTHCARE LABOR MARKET

Wages: Dental and childcare services saw above-average wage growth, while nursing and therapy services experienced more modest increases (2.4 percent and 2.1 percent, respectively).

MEDICAL INNOVATIONS

Gene Editing: CRISPR technology continued to show promise in treating genetic disorders.

Ethnic-Specific Trials: An emphasis on race and ethnicity-specific trials to improve treatment efficacy.

PATIENT SAFETY INITIATIVES

The **WHO's Global Patient Safety Report** highlighted the importance of patient safety systems worldwide.

MEDICAL TECHNOLOGY ADVANCEMENTS

Mergers and Acquisitions (M&A): Q3 2024 saw a 28 percent increase in transactions compared to Q3 2023, with services leading at 24 percent. *Source: PMCF*

Venture Investments: Medtech funding reached $16.1 billion through Q3 2024, including $5.1 billion in Q3 alone. *Source: WEAVER*

Digital Health: CMS proposed expanding coverage for digital health, while the EU finalized the AI Act regulating AI use in medical devices. *Source: DECIBIO*

Medical Robotics: Mendaera raised $73 million to advance robotic systems for precise needle-based procedures. *Source: THE WALL STREET JOURNAL*

Strong Device Sector: GE HealthCare surpassed profit expectations, driven by strong U.S. demand. *Source: REUTERS*

Q3 2024 Industry News (Continued)

Third-quarter developments in medical technology reflected a rapidly evolving medical field, with significant investments, advancements and regulatory actions shaping the future of healthcare technology.

RECENT DEVELOPMENTS IN MEDICAL TECHNOLOGY

FDA Approvals & Innovations: FDA approved several devices, with the Galien Foundation recognizing advancements in cardiovascular and renal devices. *Source: FDA*

M&A Activity: Johnson & Johnson acquired Shockwave Medical for $13.1 billion, while BD acquired Edwards Lifesciences' critical care group for $4.2 billion. *Source: MEDICAL DESIGN & OUTSOURCING & MEDTECH DIVE*

Conferences: ADLM 2024 Clinical Lab Expo and the September 2024 Digital Health Symposium focused on innovation in diagnostics and healthcare technology. *Source: BIOT MED & HITLAB*

Neuralink: Progress in brain-computer interface trials demonstrated control of devices through thought. *Source: WIKIPEDIA*

Reference Links

PMCF

WEAVER

DECIBIO

THE WALL STREET JOURNAL

REUTERS

FDA

MEDICAL DESIGN & OUTSOURCING

MEDTECH DIVE

BIOMATERIALS

REGMEDNET

CAS

CALLING ALL BOOKWORMS!

If you'd like to contribute a review of your recent favorite read to the ***Biomaterials Forum***, send it for consideration to the Editor at ***Roger_narayan@ncsu.edu***. If it's approved, it will be published in a future Forum Book Review column!

Society For Biomaterials

50TH

Half a Century of Progress

ANNUAL MEETING & EXPOSITION

APRIL 9-12, 2025 • HILTON CHICAGO

CRAFTING RESILIENCE IN MIND & MATTER