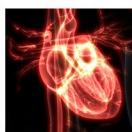
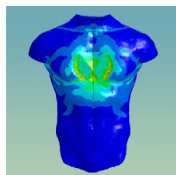
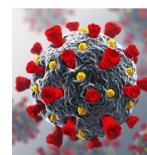
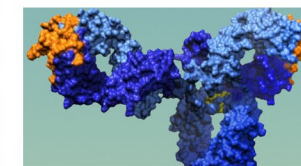
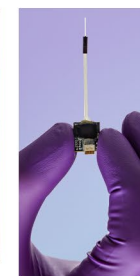
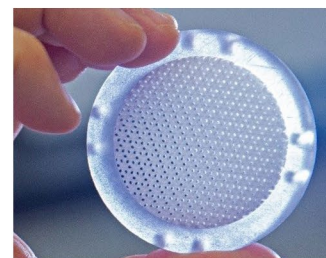
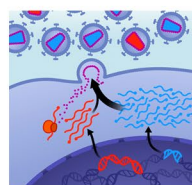
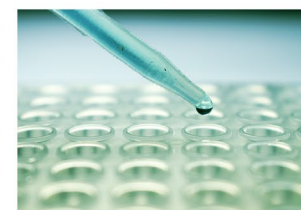
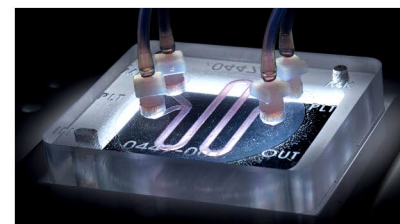
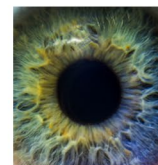


MTEC

Medical Technology
Enterprise Consortium

2020 ANNUAL REPORT

identifying **emerging medical technologies**
and facilitating **faster transition** from the laboratory
to the **battlefield, the bedside,**
and - ultimately - **across the globe**



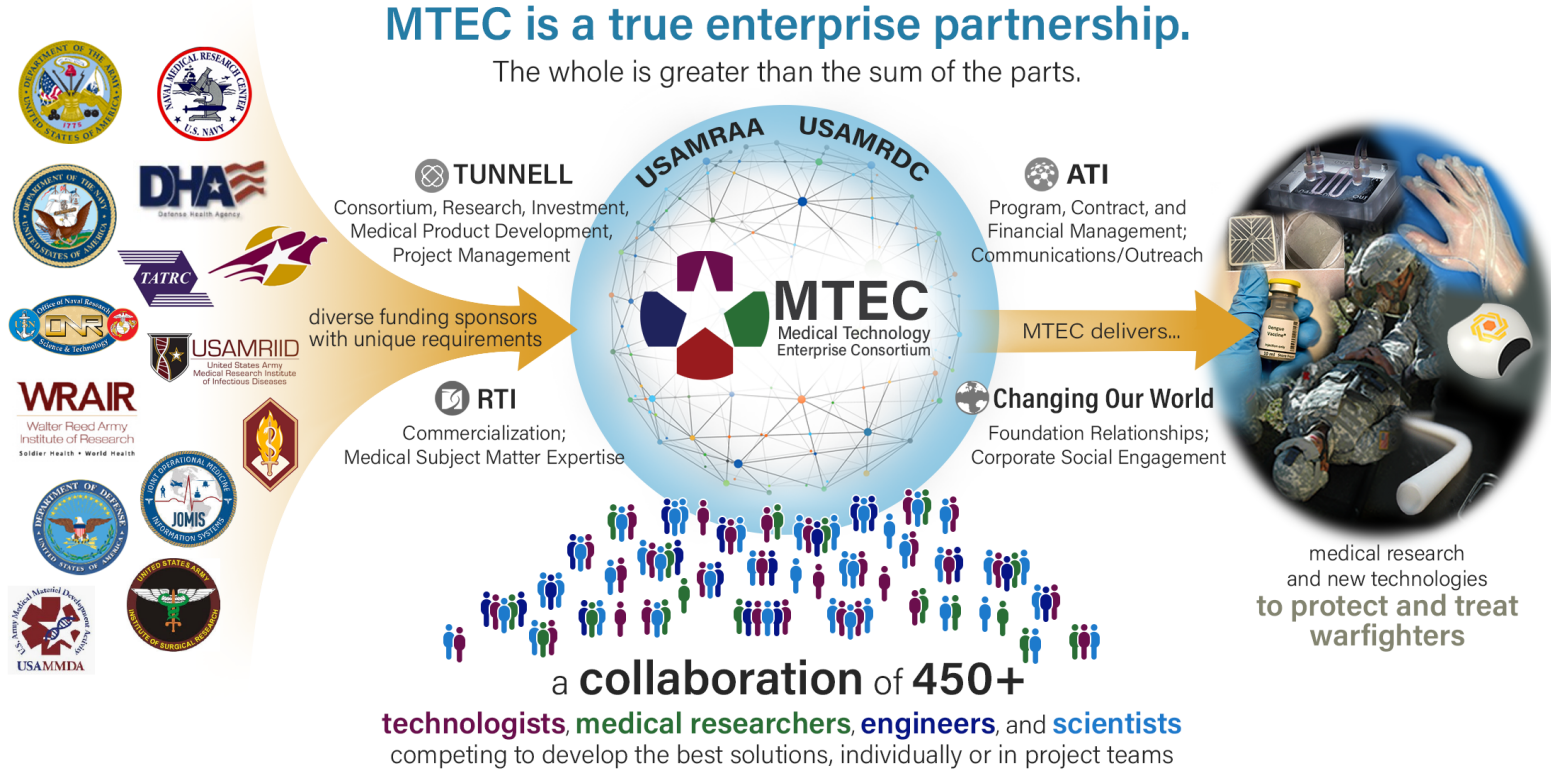
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Acronym list:

- CCCRP - Combat Casualty Care Research Program
- CRMRP - Clinical and Rehabilitative Medicine Research Program
- JOMIS - Joint Operational Medicine Information Systems
- MIDRP - Military Infectious Diseases Research Program
- MOMRP - Military Operational Medicine Research Program
- MSISRP - Medical Simulation and Information Sciences Research Program
- MRDC - Medical Research and Development Command
- NMRC - Naval Medical Research Center
- OTA - Other Transaction Agreement
- TATRC - Telemedicine & Advanced Technology Research Center
- USAMMDA - U.S. Army Medical Materiel Development Activity

MTEC is a 501(c)(3) nonprofit corporation that develops medical technologies to prevent and treat injuries and restore the health of United States military personnel and veterans.



MTEC is a public-private collaboration between the U.S. federal government (primarily DoD) and members from academic research centers, large industry leaders, small technology companies, and major medical research centers.

MTEC uses a simplified contracting vehicle (the Other Transaction Agreement (OTA)), which enables rapid

and repeated interaction between government, private technology developers, and funding partners.

As single bidders or in project teams, MTEC members compete for opportunities to develop technologies within multiple research domains that can enhance the military’s performance on the battlefield and are relevant to civilian medical needs.



Dr. Lester Martinez Lopez,
MD, MPH
MTEC Board Chairman
Major General (Retired),
U.S. Army

2020 is a great example of MTEC's ability to respond to real and urgent medical needs. COVID demanded our attention and our best. We delivered, deploying over \$75 M in funding to respond to the pandemic.

Chairman's Letter

They say that necessity is the mother of invention. Certainly the necessities of the 2020 coronavirus pandemic made our health innovation and consortium work more important than ever. Together we stepped up to the challenge of responding to those calls to action and oversaw program growth for another banner year.

In 2020, we grew MTEC membership to over 450 members, placed \$180 million in funding awards, welcomed two new Board members with venture capital expertise - Peter Soderberg and

Amy Salzhauer - welcomed a new COO and Chief Development Officer, Jill Sorensen, to complement Bill Howell's continued leadership, with Bill being promoted to MTEC President.

We formed an Investment Committee of the Board, initiated a collaboration to scout and vet medical technology companies with ARCH Venture Partners and outlined a 2021 growth strategy that steps up our service to military sponsors, members, and, ultimately, our military service men, women, and veterans whose health and wellness are our top priority.

2020 HIGHLIGHTS

- Added \$180M in new funding for total program funds exceeding \$366M in contract ceiling, over \$75M of which related to addressing the COVID-19 pandemic.
- 7% growth in membership - from 330 at calendar year end (CYE) 2019 to 461 active MTEC member organizations at CYE 2020.
- Developed strong alliances with BIO, Advamed, RESI and MedTech Innovator to expand MTEC's reach, resulting in an increase in membership and technologies applicable to the military with small business members.

MTEC Board of Directors



Walter "Skip" Auch, Jr.,
Principal, Auch Company
LLC, investment banking



Mark D. Breyen,
Medtronic, Inc. VP
Research & Technology,
Cardiac Implantables
Technology
Development Center



Gautam S. Ghatnekar,
PhD, President and
CEO, FirstString
Research, Inc.



Kent Kester, MD, FACP,
DIDS, FASTMH,
VP and Head of
Translational Science &
Biomarkers for Sanofi
Pasteur, Inc.



Pierre Noel, MD, Mayo
Clinic internal medicine
physician and Director
of Center for Military
Medicine



Andrew Omidvar,
PhD, MBA, Philips
Healthcare, Inc. VP
of Enterprise and
Government R&D for
Healthcare



Ron Poropatich, MD,
Director of the Center
for Military Medicine
Research and Professor
of Medicine at the
University of Pittsburgh



Amy Salzhauer, PhD,
MBA, Founder and
Managing Partner of
Good Growth Capital
Ventures, LLC



Peter H. Soderberg,
Managing Partner
of Worthy Venture
Resources LLC



Edward Steiner, JD,
Partner in the Global
Corporate Practice
Group of Squire Patton
Boggs LLP

MTEC Officers



Bill Howell,
President



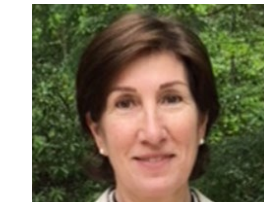
Julia Martin,
Chief Financial Officer



Bill Evans,
Treasurer



Brad Walters,
Chief Medical Officer

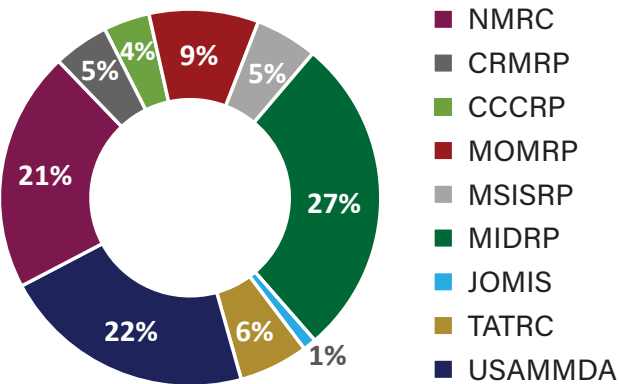


Jill Sorensen,
Chief Operating Officer

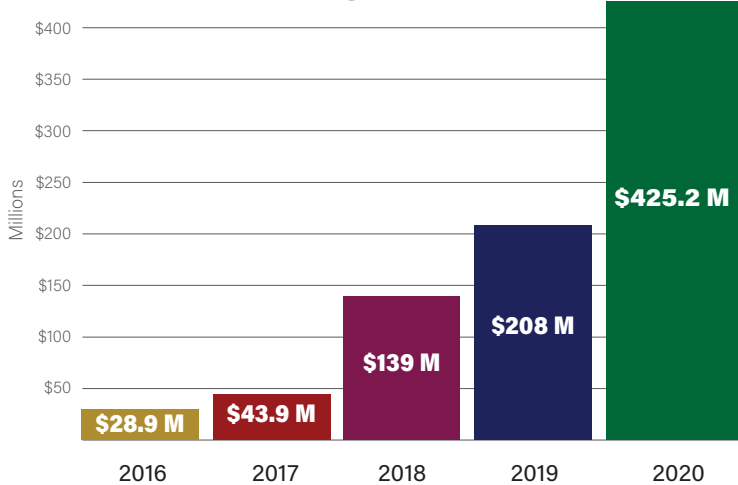
Funding

MTEC experienced a funding spike in 2020 due to the pandemic. We expect to return to our projected year over year growth in 2021, with approximately \$105M in funded research identified for 2021.

Distribution of Funding by Sponsor



Cumulative Funding (including cost-share)



2020 Funding



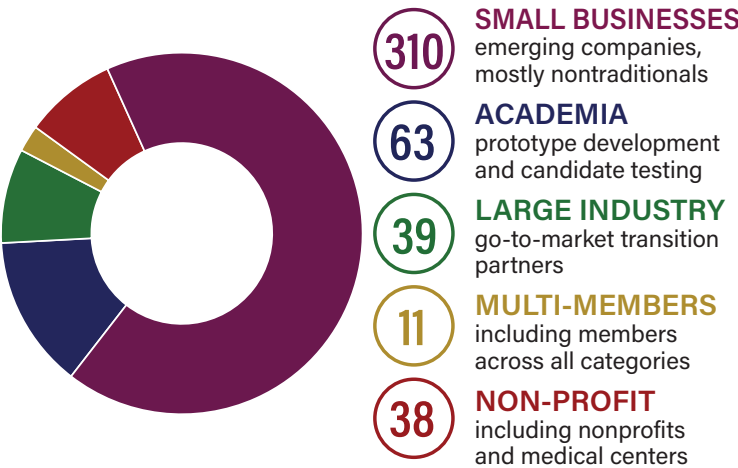
117 Projects Awarded Since Inception



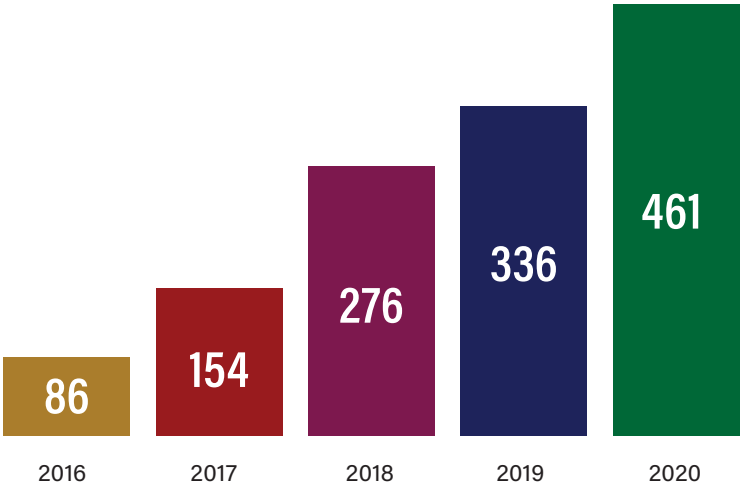
Membership

MTEC membership continues to grow in size and diversity. Small businesses and academia bring emerging innovations. Large industry provides opportunities for potential licensing and acquisitions. Other members - such as regulatory consultants, contract researchers, and manufacturing organizations - provide critical support services.

461 Member Organizations



Membership Growth



Benefits of MTEC Membership:

- Provides a means for open and transparent communication between the government and technology providers to better understand the military needs
- Promotes teaming among offerors to provide the sponsor with more complete proposals that better meet technical requirements
- Facilitates the transition to long-term prototype agreements
- Provides access to other military contracting opportunities beyond MTEC
- Provides introductions to Fortune 500 companies, venture, and foundations as additional funding sources



Military Infectious Diseases

OBJECTIVE:

Prevent infectious disease threats to eliminate their impacts on operational readiness.

AREAS OF INTEREST INCLUDE:

- Rapid diagnostic and detection devices
- Therapies to prevent and treat combat wound infections
- Control of wound progression
- Treatment and prevention of biofilm formation
- HIV countermeasures
- Prophylactic for endemic diarrheal diseases
- Broad spectrum antivirals
- Broadly protective vaccine platforms for emerging infectious diseases
- Synthetic biology

RESEARCH FUNDED IN 2020:

\$35,187,375

PROJECT SPONSORS: MIDRP, NMRC

2020 RESEARCH AWARDEES:



2020

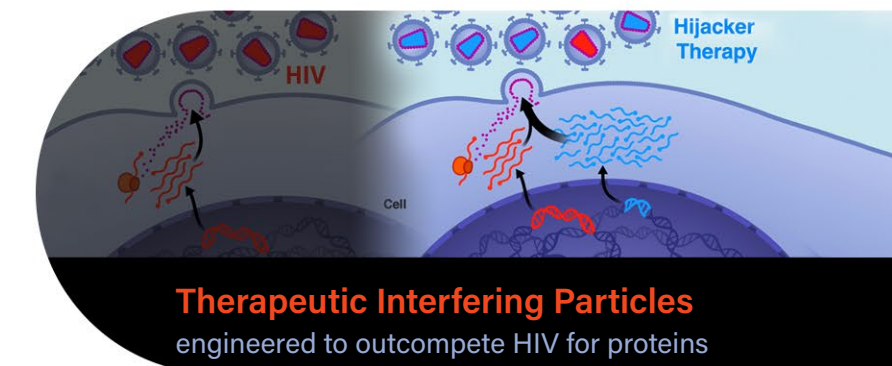
Project Highlights

Antibody Cocktail

COVID-19 is a significant force readiness issue for the United States military. In response, Lumen Bioscience has started developing and testing a low-cost, orally delivered cocktail of antibodies against SARS-CoV-2 (the virus that causes COVID-19) to prevent and treat infection of the gastrointestinal tract. A gastrointestinal-targeted therapy could reduce overall viral burden, inhibit disease progression, accelerate viral clearance, and block significant transmission routes.

Reduction of HIV Prevalence and Incidence Using Therapeutic Interfering Particles (TIPs)

The Weinberger Laboratory at University of California, San Francisco developed prototype TIPs against HIV-1 and demonstrated safety, efficacy, and broad-spectrum anti-HIV activity. The team showed that TIPs reduce HIV titers and protect CD4+ T cells (immune cells) from HIV infection in humanized mice, can mobilize to protect bystander cells in the presence of HIV co-infection, and have an exceptionally high genetic barrier to resistance. The FDA has provided initial approval for Phase 1 clinical trials based on these data.





Combat Casualty Care

OBJECTIVE:

Reduce the mortality and morbidity associated with major combat-related trauma - from the battlefield to CONUS-based hospitals.

AREAS OF INTEREST INCLUDE:

- Wound care treatments and therapies for combat injuries
- Hemorrhage control and resuscitation
- Brain trauma
- Temporary stabilization of corneal and corneoscleral injuries
- Blood and blood products
- Burn injury and organ support
- Prolonged field care
- Enabling capabilities to increase patient movement capacity
- Cognition-sparing pain control
- Artificial intelligence at point of need
- Autonomous solutions

RESEARCH FUNDED IN 2020:

\$19,549,625

2020 RESEARCH AWARDEES:

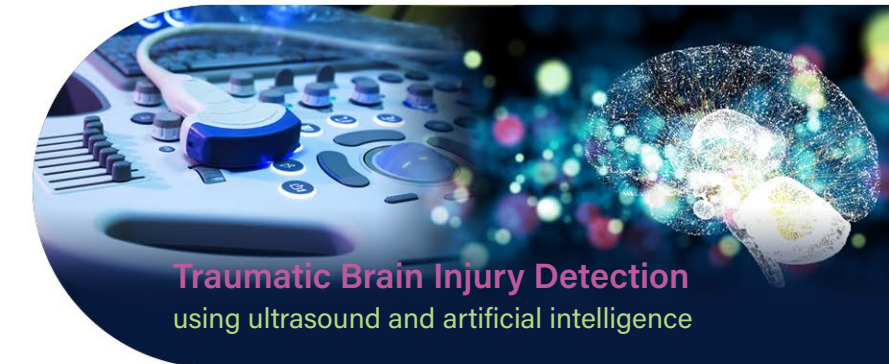


2020

Project Highlights

Artificial Intelligence (AI)-Enhanced System for Detecting Severe Traumatic Brain Injury (TBI)

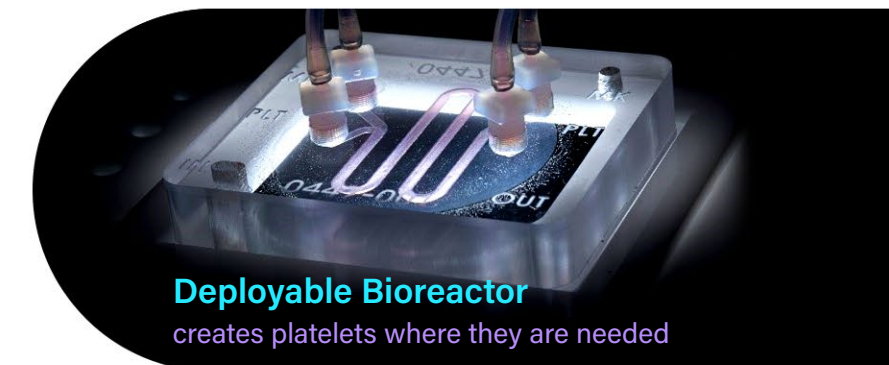
Kitware Inc. and Duke University are creating enhanced systems for detecting severe TBI by augmenting commercially-available, point of care, ultrasound devices with AI algorithms. The real-time AI algorithm is being developed using the open-source software platform ITK and PLUS libraries. A human study has been recently approved by Duke's Institutional Review Board and is pending approval by the U.S. Army's Human Research Protections Office.



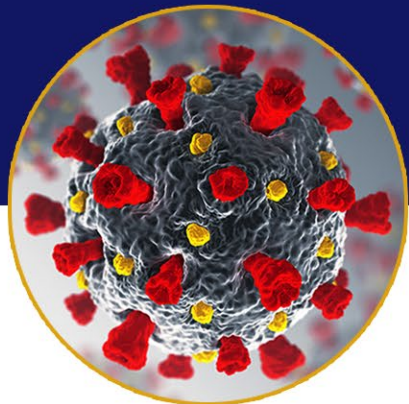
Traumatic Brain Injury Detection
using ultrasound and artificial intelligence

Development of a Deployable Bioreactor to Produce Platelet-Like Cells (PLCs)

This effort focuses on a reliable alternative for cold-stored, frozen, or lyophilized platelet storage technology that could revolutionize field care. PlateletBio's novel, deployable bioreactor can produce PLCs directly from thawed megakaryocytes. With MTEC funding, the team has implemented process improvements, finalized design work for a scaled-up bioreactor and tech transfer for the injection molding process, and completed software development and the process diagram.



Deployable Bioreactor
creates platelets where they are needed



COVID

OBJECTIVE:

Rapidly fund initiatives in support of our Nation's response to the COVID-19 pandemic.

In 2020, the COVID-19 pandemic caused deaths and extraordinary societal and economic shutdowns. Infection continues to spread with new viral mutations already emerging. In response, MTEC's agility and flexibility was showcased - 26 awards were issued totaling \$76.7M in federal funding plus an additional \$9.1M in cost share. Due to the urgent nature of the requirement, MTEC implemented a new streamlined approach to acquisition, called the Enhanced White Paper, enabling research to begin within 60 days of the release of funding opportunities.

- Rapid, accurate wearable diagnostics to identify pre-symptomatic COVID-19 cases
- Therapeutics to treat COVID-19 infection
- Cloud-based, low-resource, health information management systems to extend "virtual critical care wards" to any geographic location

RESEARCH FUNDED IN 2020:

\$76,779,739

2020 RESEARCH AWARDEES:



2020

Project Highlights

Novel Engineered Antibody Neutralizes Coronaviruses

Centivax, Inc. is developing an antibody to treat, as well as protect against, COVID-19. In vivo, and regulatory toxicology studies are complete, manufacturing is underway, and clinical trials will begin in 2021. The antibody will be delivered intravenously and subcutaneously, in hospital and non-hospital settings.

Wearable Diagnostic for Very Early Symptomatic Detection of COVID-19

Philips North America, LLC, is leading a clinical study to determine the effectiveness of BioIntelliSense's BioSticker. The wearable device will be worn for 14 days to monitor for temperature, respiration and heart rate, body position, and coughing. The goal is to obtain regulatory clearance and be ready for distribution.

National Emergency Tele-Critical Care Network (NETCCN)

NETCCN platforms support high-quality intensive care in locations that lack adequate critical care expertise or resources for care of COVID-19 patients. Avera Health, Deloitte Consulting, LLP, Expressions Network, LLC, and the Geneva Foundation have validated their platforms through simulation testing and are currently delivering tele-care for COVID through their NETCCN apps.



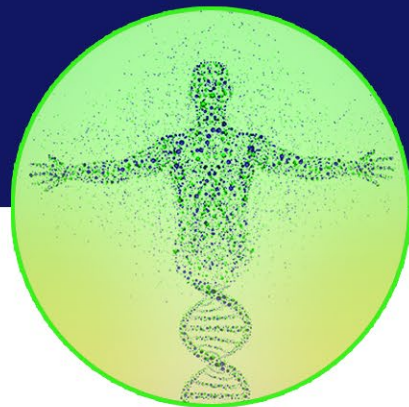
Coronavirus-Neutralizing Antibody
engineered for efficacy, safety, and shelf-life



Wearable Diagnostic Device
to detect COVID and trigger early intervention



Tele-Critical Care Network
extends the reach of medical expertise



Clinical and Rehabilitative Medicine

OBJECTIVE:

Develop restorative treatments to maximize function of wounded service members in terms of duty, performance, and quality of life.

In 2021, Clinical and Rehabilitative Medicine will no longer be reported as a separate program, where some of its areas of interest will be integrated into either Combat Casualty Care or Military Operational Medicine, as appropriate.

AREAS OF INTEREST INCLUDE:

- Treatment of Neuromusculoskeletal (NMS) injury
- Battlefield pain management
- Biomanufacturing of regenerative medicine therapies

RESEARCH FUNDED IN 2020:

\$8,328,396

PROJECT SPONSOR: CRM RP

2020 RESEARCH AWARDEES:



2020

Project Highlights

Universal Media Supports Cells Derived from Different Tissue Types

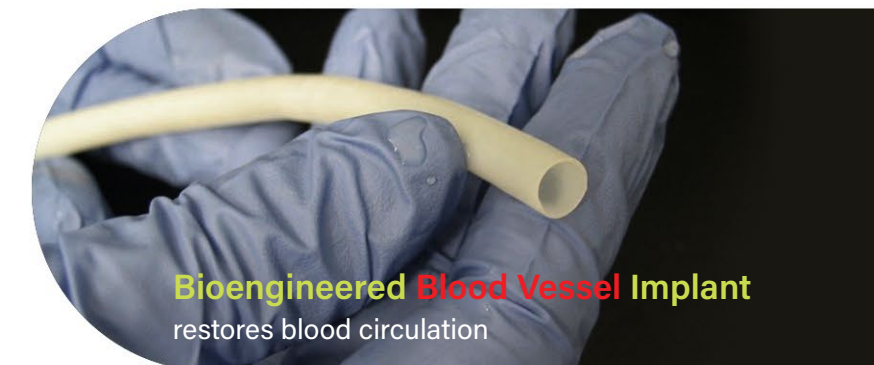
RegenMed Development Organization is developing a set of universal culture media formulations, both serum-free and xeno-free, with compatible bio-coatings for the expansion of clinically relevant human primary cells derived from each germ layer. Recent accomplishments include the development of two universal media formulations, expansion of bone marrow mesenchymal stem cells using the universal medium, scale-up to 20 L, and development of standard operating procedures for performance testing.



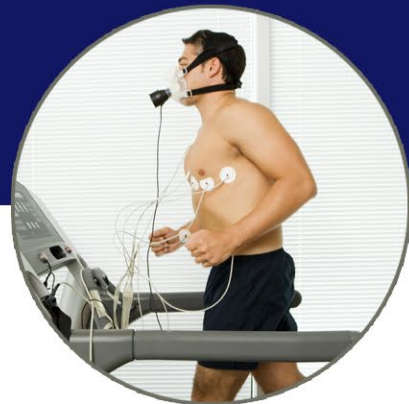
Universal Culture Media
for cell therapy and tissue engineering

Bioengineered Blood Vessel Restores Blood Circulation to Retired Military Veteran's Leg

Supported by an expanded access approval by the U.S. FDA, four patients have received Humacyte's off-the-shelf, implantable, bioengineered human acellular vessels (HAVs) to restore blood circulation. "We are excited with the results and see the HAV as a potentially transformative way to treat combat injured with vascular trauma and select numbers of military beneficiaries with vascular disease," said Todd E. Rasmussen, MD, FACS and Colonel USAF MC, Uniformed Services University.



Bioengineered Blood Vessel Implant
restores blood circulation



Military Operations Medicine

OBJECTIVE:

Maximize health, readiness, and performance by countering stressors and preventing physical and psychological injuries during training and operations.

AREAS OF INTEREST INCLUDE:

- Musculoskeletal injury - prevent, diagnose, and return-to-readiness
- Physiological monitoring systems
- Health, and performance in austere environments
- Performance optimization and enhancement
- Alertness and cognitive health
- Warfighter and family psychological health and resilience to stressors
- Post-traumatic stress disorder
- Behavioral health and wellness
- Blunt, blast, and accelerative injury
- Sensory system function after combat threats

RESEARCH FUNDED IN 2020:

\$35,766,581

PROJECT SPONSORS: MOMRP, NMRC, USAMMDA

2020 RESEARCH AWARDEES:

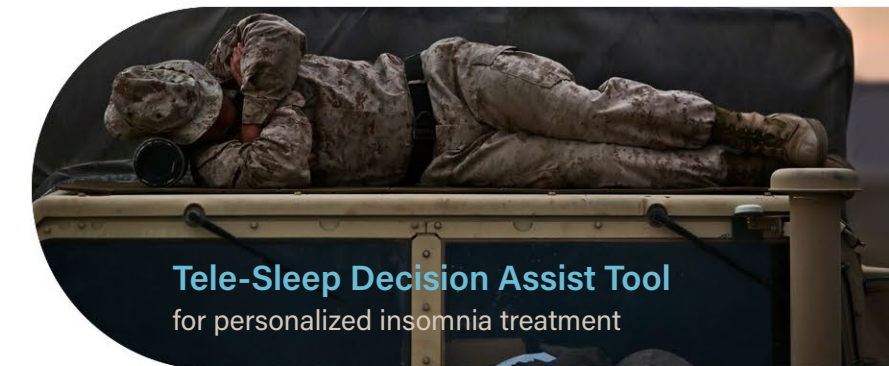


2020

Project Highlights

Optimizing Scalability of Evidence-Based Behavioral Sleep Medicine

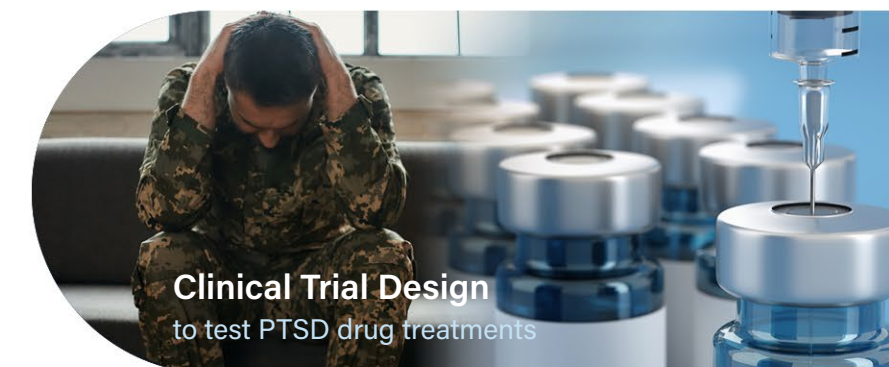
NOCTEM has begun enrolling healthcare providers and patients for their clinical trial to evaluate a new software solution that will provide military service members with personalized insomnia treatment. NOCTEM's new software solution aims to upskill providers with decision support algorithms, increase capacity to monitor service members' sleep and compliance in real time, and deliver personalized evidence-based sleep optimization recommendations to service members remotely.



Tele-Sleep Decision Assist Tool
for personalized insomnia treatment

Post-Traumatic Stress Disorder (PTSD) Drug Treatment

MTEC awarded \$25M to support the evaluation of drug interventions to treat PTSD in an adaptive platform trial (APT) design. Project awardees are working closely with the USAMMDA Warfighter Brain Health Project Management Office to perform statistical modeling for the trial design, prioritize a list of recommended drugs for inclusion, develop the clinical trial infrastructure, and execute the APT. A minimum of two drugs will be tested versus a placebo using the APT.



Clinical Trial Design
to test PTSD drug treatments



Medical Simulation and Information Sciences

OBJECTIVE:

Transition more capable healthcare information and medical simulation technologies into military healthcare relevant applications.

AREAS OF INTEREST INCLUDE:

- Medical simulation
- Health informatics
- Casualty management to support dispersed operations
- Remote tele-monitoring
- Battlefield medical automation
- Interoperable automated systems
- Autonomous care and artificial intelligence at POI
- Trainings that optimize practice and effectiveness (i.e. brain focused and learning retention)
- Artificial Intelligence
- Human machine integration
- Interoperable haptic platforms

RESEARCH FUNDED IN 2020:

\$21,308,830

2020 RESEARCH AWARDEES:

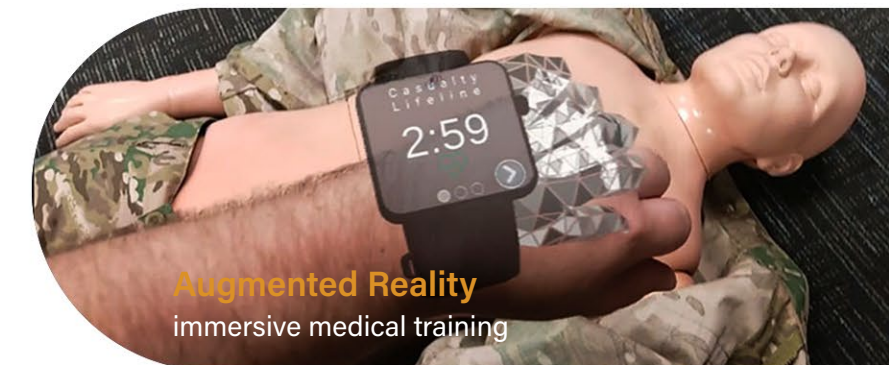


2020

Project Highlights

Augmented Reality Training Tool

Design Interactive, Inc. is advancing medical simulation using AUGMED, an augmented reality medical training tool that combines augmented reality, mixed reality, and virtual reality. In September 2020, 12 soldiers and Army reservists participated in a U.S. Army Combat Lifesaver Course using AUGMED's immersive, "extended reality" to help prepare soldiers for lifesaving interventions in stressful situations. This platform will offer training modalities relevant to future battlefield scenarios.



Augmented Reality
immersive medical training

Medical Logistics – A Roadmap to Industry Best Practices

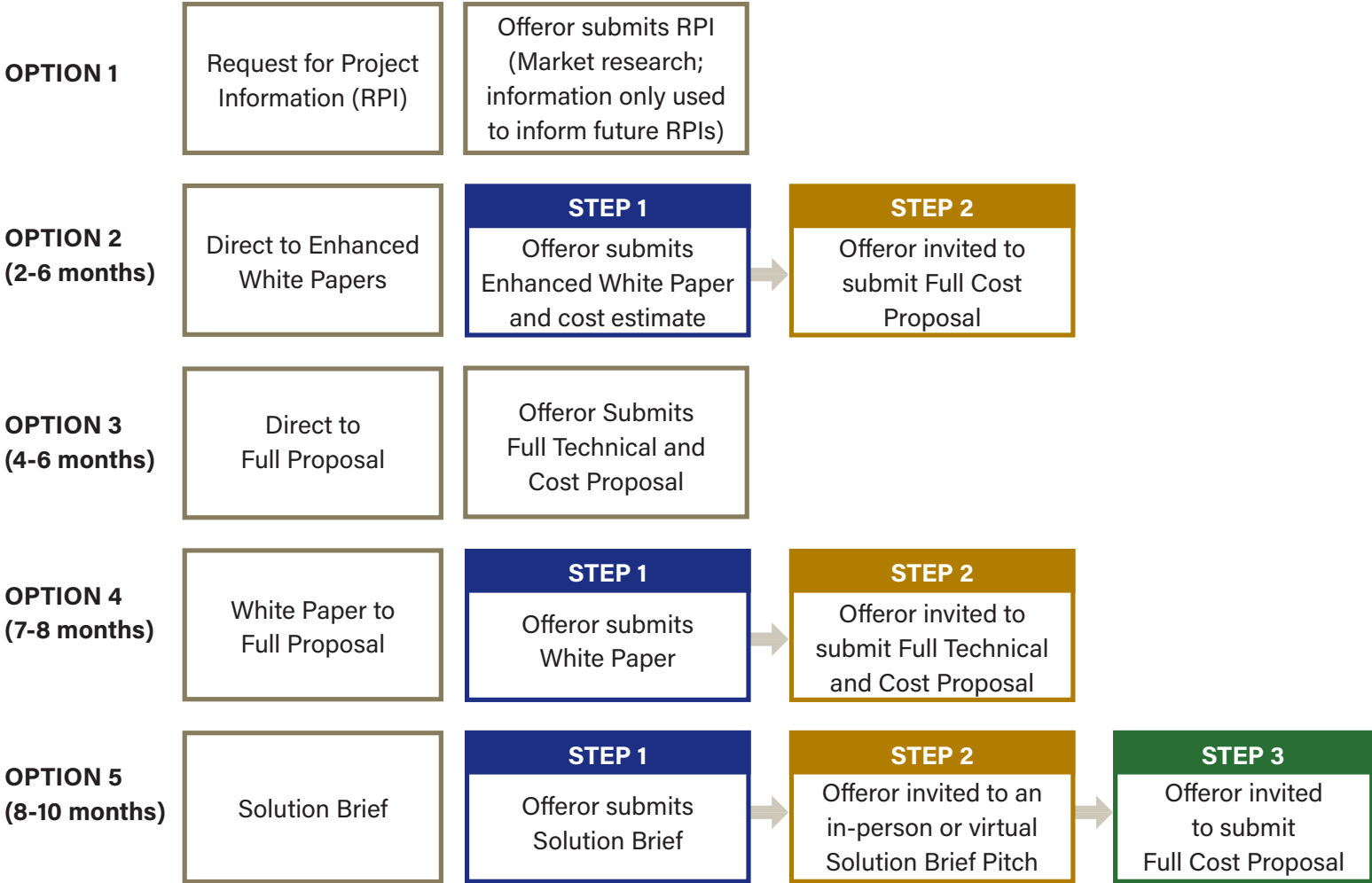
Arizona State University compared the military medical logistics system and supply chain to industry best practices and recommended ways for the military to become a fully integrated supply chain organization (FISCO). Detailed roadmaps were provided for six FISCO functions: (1) authoritative data management, (2) product standardization, (3) contracting, (4) inventory management, (5) asset management and (6) product recall management. This information will help optimize performance and provide high quality services while reducing logistics variability.



Optimizing Military Medical Logistics
to improve performance and consistency

Solicitation and Award Methodologies

MTEC has developed tailored but formalized solicitation methods to fund sponsor desires as well as present medical technologies in development.



MTEC OTA Benefits

MTEC offers **government** innovative technology **solutions**.

Government program managers get

- expanded access to industry experts and researchers
- rapid technology delivery
- novel solutions to complex challenges

MTEC offers **academia & industry** research and business **opportunities**.

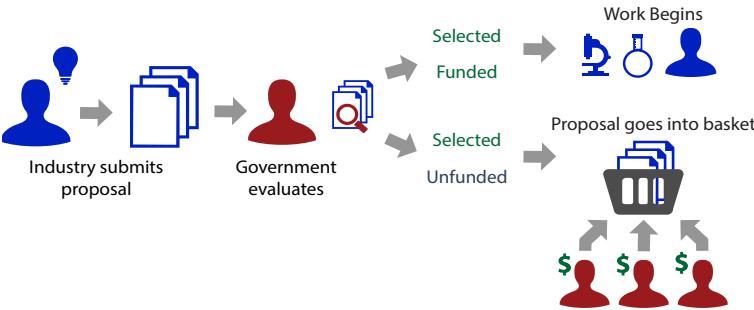
Collaboration members can

- communicate openly with government and each other
- compete for research projects
- develop technology for federal customers

MTEC's Basket Provision

The use of an "electronic basket" provides a means to maintain technically acceptable and reasonably priced proposals at a ready-to-award status for two years.

Any funding sponsor can access these proposals as funding becomes available without re-solicitation, thereby allowing the speedy and efficient use of future FY funding, expiring funds, or withheld appropriations.



Technology and Industry Outreach

An important facet of the MTEC mission is our ability to provide technology solutions that are responsive to the military's medical needs. In support of this goal, MTEC conducts outreach at several venues to recruit businesses and universities with military-relevant technologies. The outreach for 2020 included the following activities:

- Monthly technology scouting through participation in life science conferences, workshops, summits, and investor networking events, where we identified non-traditional companies for potential awards. We collaborated with ARCH Venture Partners to support scouting and investor networking.
- Facilitated member engagement with military sponsors and explained how best to do business with the military.
- Operated the Member Collaboration Tool, an MTEC web-enabled service, to facilitate member teaming, information exchange, and collaboration.
- Accessed subject matter experts to facilitate technology and company development in support of commercialization readiness of MTEC members.



Diversified Funding Sponsors

The U.S. Army Medical and Research Development Command's Joint Program Committees remain MTEC's biggest funding sponsors, but a rise in the number and diversity of new sponsors mirrors the growth of MTEC membership, capabilities, and deliverables.

Combat Casualty Care Research Program

Clinical & Rehabilitative Medicine Research Program

Military Operational Medicine Research Program

Military Infectious Disease Research Program

Medical Simulation & Information Sciences Research Program

Clinical & Rehabilitative Medicine Research Program

Naval Medical Research Center

U.S. Army Medical Materiel Development Activity

Combat Casualty Care Research Program

U.S. Army Institute of Surgical Research

Naval Medical Research Center

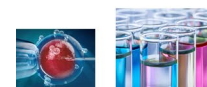
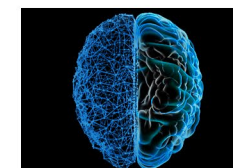
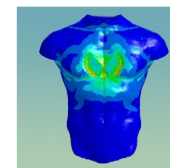
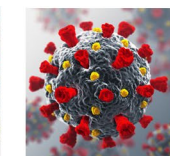
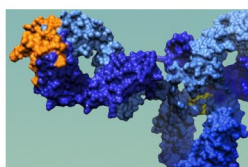
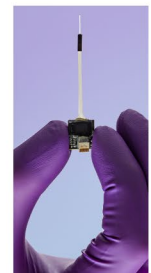
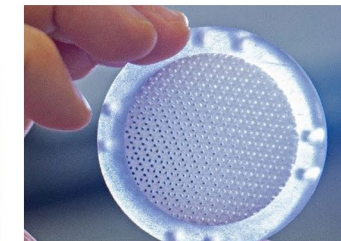
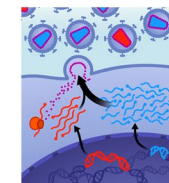
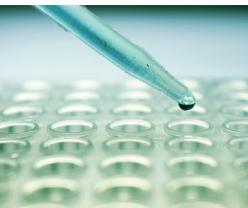
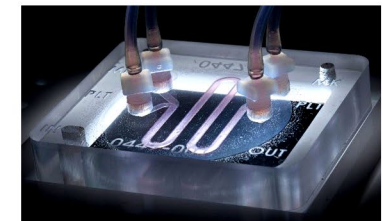
U.S. Army Institute of Surgical Research

Telemedicine & Advanced Technology Research Center

Joint Operational Medicine Information Systems

Walter Reed Army Institute of Research

Office of Naval Research



Feedback

“MRDC’s global health initiatives in far forward settings have put us at the forefront of telemedicine for many years, so when coronavirus emerged in-country, we leveraged our capabilities to help address the coronavirus pandemic through our National Emergency Telemedicine Critical Care Network (NETCCN). **MTEC facilitated rapid deployment of our emergency response initiatives and supported our outreach to the med tech community. We have appreciated the nimble, creative and highly professional work of the MTEC team**, and look forward to building our critical networks with them moving forward.”

Jeanette Little, CIV U.S. Army Futures Command

“Working with MTEC has been fantastic! **We have been able to very rapidly work through contract issues** and have appreciated both MTEC’s and MRDC’s professionalism throughout. In addition, **the much more collaborative approach through this contract vehicle has made the programs run smoothly once funded, allowing us to better develop solutions for the Warfighter, as well as civilian patients.**”

Ross Donaldson, Critical Innovations

“**The HAV was given to me**, a woman who had a bad infection after having a first surgery to place a synthetic graft as a bypass, and **now I’m living pretty much a normal life.** Here I am two years later hearing about further developments in this field. **All the people on these teams that are coming together to get these products to market for patients, it’s like we’re watching the future play out right in front of us** and I’m just really super grateful to be a part of it”

A recipient of Humacyte’s Bioengineered Blood Vessel Implant



Strategic Plan: 2020 Review

Outcomes for Sponsors

- Proposal acceptance rate > 40%
- Diversity of funding sponsors increased
- Military “OTA Workshops” conducted. The new proposal submission and evaluation system, BIDs, was implemented in 2020

Research and Business Opportunities for Members

- Strong relationship building between the military and our members
- Venture capital and investment networks engaged to scout new technology and company offerings
- Educational webinars offered

2021 Goals

- Increase diversity of private and public funding sponsors, including a number of federal agencies that are in discussion with MRDC about using the MTEC OTA
- Enhance MTEC commercialization services support and subject matter engagement to ensure technology development progress

Collaboration

- 75% of awards to nontraditionals with active teaming
- Active participation in MedTech Innovator, RESI, AdvaMed, and related investor networking

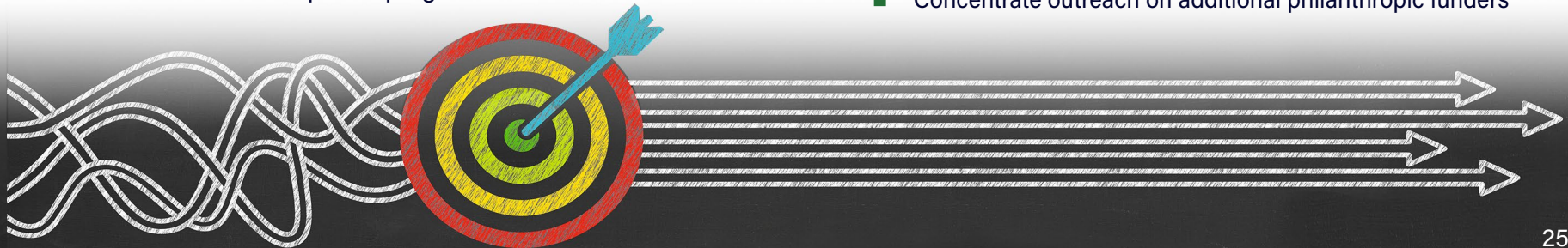
External Funding

- Formed Board Investment Committee
- Authorized Industry Partners Program
- Approved Bright Focus Foundation Award (\$250K match to be funded in 2021)

Resources to Fulfill Mission

- Prudent budgets maintained low operational costs
- Funding reserves identified to grow commercialization services to members

- Initiate outreach to corporate and economic development offices
- Advance relationship with ARCH Venture Partners and investment community to enhance tech visibility and attract private funding
- Concentrate outreach on additional philanthropic funders



We're here to help! Get in touch to see how you can contribute to MTEC's mission to identify, develop, and transition medical technologies.

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