

2022 MTEC

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Acronyms

CCCRP- Combat Casualty Care Research Program **CRMRP**- Clinical & Rehabilitative Medicine Research Program **DTRA**- Defense Threat Reduction Agency **JOMIS**- Joint Operational Medicine Information Systems **MIDRP**- Military Infectious Diseases Research Program **MOMRP**- Military Operational Medicine Research Program **MSISRP-** Medical Simulation & Information Sciences **Research Program** MTEC- Medical Technology Enterprise Consortium NMRC- Naval Medical Research Center **ONR**- Office of Naval Research **OREF**- Orthopaedic Research & Education Foundation **OTA**- Other Transaction Agreement **TATRC**- Telemedicine & Advanced Technology Research Center **TBI-** Tramatic Brain Injury 23 **USAISR-** U.S. Army Institute of Surgical Research USAMMDA- U.S. Army Medical Materiel Development Activity USAMRDC- U.S. Army Medical Research & Development 27 Command USARIEM- United States Army Research Institute of 29 Environmental Medicine **USUHS**- Uniformed Services University of the Health Sciences WRAIR- Walter Reed Army Institute of Research

-WHO WE ARE

The Medical Technology Enterprise Consortium (MTEC) is a non-profit biomedical technology consortium collaborating under an Other Transaction Agreement (OTA) with the U.S. Army Medical Research and Development Command (USAMRDC) located at Fort Detrick, Maryland. MTEC aims to propel innovative technologies forward within the medical space to meet both military and civilian needs.







From The Chair



Ellen Embrev MTEC Board Chair, 2022-Present

⁶2022 proved to be a year of growth and funding diversification

In my inaugural year as Chair of the MTEC Board, I am both honored to serve and impressed by my fellow MTEC Board members, leadership, and community. 2022 proved to be yet another growth year for the organization. We achieved a membership milestone by exceeding 600 members. We have distributed over \$700M in funding since inception. We have deepened relations with all member stakeholder sets – sponsors, collaborators, industry, academic institutions, foundations and investors. We are actively building out our investor network in order to address member funding needs. We are collaborating with federal health agencies and enhancing relations with the Defense Health Agency as the transition to its leadership occurs in the military research and development investments and programs.

2022 presented new opportunities for MTEC leadership, including sponsorship of military medical fellowships in collaboration with the American Psychiatric Association Foundation, the Milken Institute Health Summit, the American Brain Coalition, and the Orthopedic Research and Education Foundation (OREF), to name a few. These efforts have been years in the making. MTEC's dedication to serving you, sponsors, members, and stakeholders, is the foundation on which these opportunities are built.

Special thanks to our professional staff who continue to be high performing, especially with communications and outreach to all of you. We hosted a record number of webinars, events, scouting and pitch competitions. Our team is building commercialization services, subject matter expert networks through our M-Corps Partners, and a growing portfolio of projects selected for funding by our sponsors.

We look forward to growing and learning with you in 2023 to keep our military medical enterprise healthier and stronger than ever.

2022 Performance Highlights



51

\$154.4M IN NEW FUNDING awarded across 62 new projects

9 FUNDING OPPORTUNITIES covering **26** topic areas

> CLOSED-OUT PROJECTS resulting in **7** commercial products

OF PROJECTS HAVE SECURED FUNDING 47% FOLLOWING MTEC AWARD ACTIVE PROPOSALS IN THE BASKET OF PROJECTS ARE AVERAGE TECHNOLOGY READINESS LEVEL 30% DOING HUMAN SUBJECT TESTING HOSTED 40+ **OF PROJECTS** WEBINARS REACHING A INTERACTED WITH 25% EVENTS U.S. FDA ATTENDED BY MEMBERS 5



BRIDGE FUNDING

provided through

- PROTOTYPE ACCELEBATION AWARDS
- COMMERCIALIZATION GRANTS





20K+ HUMAN SUBJECTS **ENROLLED IN** STUDIES



Since inception

\$781M MILITARY SPONSOR FUNDING

New Awards, Incremental Funding, and Follow On

- USARIEM, \$1.5M
- MRDC, \$1.4M

WRAIR Walter Reed Army Institute of Research







5884M including \$103M Cost Share						\$884 M		
				\$425.2 M	\$708.8 M			
8.9 M	\$43.9 M	\$139 M	\$208 M					
016	2017	2018	2019	2020	2021	2022	_	

Membership at 2022 Calendar Year's End









Strategic Partnerships

MTEC engaged in several partnerships to increase research opportunities, capabilities, and visibility for medical issues of importance to both the military and civilians.

MedTech Innovator facilitated introductions for 17 companies to USAMRDC through Pitch Days.

Joining New Coalitions of Leaders

MTEC is now a member of the American Brain Coalition, a network of the country's leading professional neurological, psychological, and psychiatric associations and nonprofits.

OREF partnered with Military Operational Medicine Research Program (MOMRP) to search for solutions to musculoskeletal injuries.

Q

MTEC's sponsorship of the American Psychiatric Association's Research Colloquium for Junior Psychiatrist Investigators added a military mental health track to its curriculum, focusing on Post-Traumatic Stress Disorder, Suicide, and Traumatic Brain Injury (TBI).



Connecting with Changemakers

MTEC participated in the Milken Institute's Future of Health Summit, with Dr. Terry Rauch joining an esteemed group of panelists, to discuss pandemic preparedness to an audience of over 750 business leaders, policymakers, philanthropists, academics, investors, researchers, and scientists.

Fostering Research in Military Mental Health

Defense Threat Reduction Agency (DTRA) sponsored their first Request for Proposals.

ARCH Venture Partners supported USAMRDC with technology deep dives.



Military Infectious Diseases

OBJECTIVE

Prevent, predict, and treat infectious disease threats to eliminate their impacts on operational readiness and performance.

AREAS OF INTEREST:

- Diagnostics for invasive fungal infections
- Prophylactic to prevent infection in battlefield wounds
- Wound care technologies to treat combat wound infections
- Pathogen agnostic countermeasures to prevent and treat sepsis caused by wound infections
- Prevention and treatment of biofilm formation
- Prophylactic for endemic diarrheal diseases
- Broad spectrum antivirals to prevent and treat endemic and emerging infectious diseases

Inhalon Biopharma

Funding: \$7M

Immunotherapies for Respiratory Infection

Inhalon is developing immunotherapies with an inhaled muco-trapping antibody platform to prevent and treat acute respiratory infections. Inhalon completed a Phase 1 clinical study which demonstrated good tolerability and achieved concentrations in the respiratory tract above its inhibitory concentration.

inflammation and severe disease in a hamster model.

Armata is developing a novel bacteriophage therapeutic,

Bacteriophage Therapeutics for Infection Control

AP-SA02, to treat patients with Staphylococcus aureus bacteremia. Armata initiated a Phase 1b/2a study of the safety, tolerability, and efficacy of intravenous AP-SA02.

Therapeutic Interfering Particles for Viral Disease Treatment

VxBiosciences is advancing therapeutic interfering

particles (TIPs) as a new class of single-administration

the SARS-CoV-2 virus, reduce viral loads, and suppress

antiviral treatments. TIPs have been shown to inhibit

VxBiosciences

Project Highlights

Armata Pharmaceuticals

Funding: \$11M



2022 NEW FUNDING: \$11,766,590

2022 FUNDING INCREASES: \$13,310,050

Funding: \$16M







Combat Casualty Care

OBJECTIVE

Reduce mortality and morbidity associated with combat trauma from the battlefield to hospital.

AREAS OF INTEREST:

Prolonged field care

2022 NEW FUNDING:

- Therapeutics for ischemia reperfusion injury
- Wound care treatments for use at point of injury
- Solutions for non-compressible (i.e., truncal) hemorrhage

- Burn assessment, care and training tools
- Surgical support for damage control procedures for use in far forward and austere settings
- Technologies or therapeutics for management of lung and kidney organ injury/failure
- Warfighter brain health and injury



NEW PROJECT SPONSORS: CCCRP, NMRC, USAMMDA





ULURU

Funding: \$3M

Far-Forward Wound Care

ULURU is developing a cost-effective wound care technology, Altrazeal, that can be applied at the point-of-injury to enable early wound healing. ULURU is currently evaluating efficacy of Altrazeal in patients with diabetic foot ulcers.

Astrocyte Pharmaceuticals

Funding: \$4M

Pharmaceutical for TBI Management

Astrocyte is developing a cerebroprotective therapeutic, AST-004, as a far forward treatment for traumatic brain injury. They have completed a Phase 1 clinical trial enabling advancement toward a Phase 2 trial.

Indiana University

Funding: \$2M

Electroceutical Wound Management

The Roy Lab has co-developed a novel bandage platform called electroceutical dressing technologies, that mitigates wound biofilm and combats antibiotic resistant infections by making bacteria susceptible to available antibiotics at the point-of-injury. This technology can be used to significantly reduce or eliminate infection, improved wound closure, and enhance proper skin function during the healing process.









AREAS OF INTEREST:

Adjustment disorders treatments

Post-traumatic Stress Disorder

Management of circadian disruption

Prevention, treatment of decompression sickness

Military Operational Medicine

OBJECTIVE Maximize health, readiness, and performance by countering, preventing, and treating injuries.

Musculoskeletal injury prevention, treatment, and rehabilitation

- Warfighter performance optimization
- Sex-specific training and strategies to promote readiness
- Warfighter and family psychological health and resilience to stressors





University of Maryland Funding: \$2M **Sleep Disorders and Research Center**

Personalized Sleep Improvement Software

The Center has developed software that leverages personalized sleep assessments, remote monitoring, and big data analytics to improve outcomes and reduce costs. The team has completed a large-scale roll-out into joint service military hospitals.

University of California San Francisco

Funding: \$7M

Pathogen Detection via Oura Ring

Researchers have found that algorithms using information collected by the commercially available Oura Ring may detect pathogens such as COVID-19 before formal diagnosis.

NIRSense

Funding: \$4M

Wearable Deep Tissue Oxygen Monitoring

NIRSense is advancing a ruggedized wearable system to monitor oxygen 10x deeper than pulse oximetry. This system alerts military users to the risks of physiological degradation in the operational environment. The system is preparing for a definitive clinical trial this summer and submission to the FDA this fall.











Medical Simulation & Information Sciences

OBJECTIVE

Optimize front line medical care and interventions through robotics, intelligent systems, and improved education and training.

AREAS OF INTEREST:

- Trainings that optimize practice and effectiveness
- Artificial intelligence to support medical resupply in theater
- Battlefield medical automation
- Autonomous care and AI at the point-of-injury in austere environments

- Remote tele-monitoring
- Health informatics
- Next generation casualty management
- Human-machine integration
- Interoperable haptic platforms to support virtual and augmented education tools
- Interoperable automatic systems

2022 NEW FUNDING: \$8,316,825

NEW PROJECT SPONSORS: CCCRP, USAMMDA, USUHS

NEW PROJECT AWARDEES:

2022 FUNDING INCREASES: \$16,527,274

Booz | Allen | Hamilton





Applied Research Associates

Funding: \$4M

Hemorrhage Risk Assessment

The team has developed AI models for assessing the risk of internal hemorrhage and calculating the probability of shock, which will enable the rapid diagnosis and treatment of trauma symptoms and lead to reduced morbidity and mortality.

Information Visualization and Innovative Research (IVIR)

Funding: \$5M

Joint Emergency Trauma Simulation

The Joint Emergency Trauma Simulation system enables standardized, integrated, state-of-the-art training through an interconnected web of systems designed to serve as joint simulations to track patient movement from the point of injury to a controlled medical area. IVIR has completed their funded scope of work with a demonstration of the final prototype system to the military. Further pilot testing and refinement is pending.

Charles River Analytics

Funding: \$1M

Trauma Assessment Training

The team has developed a mobile system for TCCC training that improves the availability of trauma scenarios in a variety of virtual operational environments necessary for practice and skills maintenance. This award has been completed.









Clinical & Rehabilitative Medicine

OBJECTIVE

Improve restorative treatments and rehabilitative care to maximize function for return to duty or civilian life.

AREAS OF INTEREST:

- Craniomaxillofacial regeneration
- Extremity and soft tissue regeneration (bone, muscle, and/or nerve)
- Genitourinary/lower abdomen reconstruction
- Skin regeneration

- Ex-vivo/on-demand blood
- Sensory system (vision, hearing, balance) preservation and restoration
- Cellular therapies for trauma and critical care
- Prevention and treatment of dental pain and infections

2022 NEW FUNDING: \$12,358,891

NEW PROJECT SPONSORS: MOMRP, NMRC

NEW PROJECT AWARDEES:

2022 FUNDING INCREASES: \$5,301,314



University of Pittsburgh



MOLDA

Project Highlights

RegenMed Development Organization (ReMDO)

Funding: \$5M

Universal Media for Cell Production

ReMDO has been developing universal media with the overall goal of producing unifying culture medias, both serum-free and xenofree, with compatible bio-coatings for the expansion of numerous clinically relevant human primary cells derived from each germ layer.

Scientific & Biomedical Microsystems

Funding: \$2M

Neuronal Interface for Vision Restoration

The team has developed a prototype system with cutting-edge hardware and software platforms for high-density next generation neuronal recording and stimulation. The ultimate goal is to demonstrate visual prosthesis. The project has shown safety and efficacy in non-human primates and been safely used in six human patients thus far.

Southwest Research Institute

3D Printed Bioreactor System

The Institute is working to streamline stem cell manufacturing by using a novel 3D printed bioreactor system. The team has successfully demonstrated a scalable expansion of stem cells and stem cell-derived exosomes. This novel bioreactor platform is promising for manufacturing many cell-derived biologics.

Funding: \$3M







MTEC Connects Members...

...to

Excellence





(

...to Each Other

...to

Experts





Commercialization Grants

MTEC awarded 13 Commercialization Grants totaling over \$580K in non-dilutive funds to small business members. These grants facilitated partnerships with M-Corps partners to address business planning strategies for product development.

Below are 3 awardees and the impact the partnership had on each project's success:



Complete a market access strategy

for its SynthoPlate Artificial Platelet

Alira provided insight into the

strategies that Haima needed for

"Alira provided a report

that we were able to share

with interested parties to

increase excitement and

support for our program."

Haima Therapeutics CEO

Michael Bruckman,

clinical and reimbursement

M-Corps:

platform.

launch.

Outcome:

Project Goal:

Awardee:

M-Corps: AliraHealth

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Latham
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Project Goal:

Complete a commercialization analysis and plan for Traveler's Diarrhea Therapeutic.

Outcome:

The strategy devised invigorated Lumen's belief in the value of the product and solidified the commercial plan.

"We now have a solid plan, backed by third-party research, to ensure we get this to as many patients as possible."

Brian Finrow. Lumen Co-founder and CEO

with the M-Corps, 25 subject matter experts and service providers, who assist MTEC members with business, technical, and regulatory strategies for their medical technology.







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2022 MTEC Member Awards & Recognition







FOUNDATION PARTNER

Musculoskeletal injuries exact a tremendous toll on our Service members and OREF is delighted to collaborate with MTEC and MOMRP to offer this incredible opportunity, which will provide significant funding for research focused on accelerating returnto-readiness for Service members affected by musculoskeletal injuries."

COL James R. Ficke, MD, U.S. Army (ret), Trustee, Orthopaedic Research and Education Foundation, oref.org

MILITARY SPONSOR

The MTEC OTA enabled the Warfighter Brain Health Program Management Office to implement an innovative Brain Health Prime Integrator Program. This program will enable the PMO to rapidly adapt to changing technologies, de-risk development efforts in both advanced development (AD) and the S&T base, bridge the gap between AD and S&T, and enable rapid delivery of brain health solutions to the Warfighter."

Lou Jasper, Project Manager, Warfighter Brain Health PMO, USAMMDA

MTEC MEMBERS

MTEC has been the perfect partner – providing critical funding, facilitating key discussions with the DoD USAMRDC, and enabling our potential TBI therapeutic to successfully advance through Phase 1 clinical studies."

William S. Korinek, PhD, CEO, Astrocyte Pharmaceuticals Inc, astrocytepharma.com

"GE Research is proud to collaborate with MTEC on projects that not only help improve the quality of care for our nation's military and veterans, but also bring these solutions to the broader healthcare community. It's an important way we can help drive GE HealthCare's broader commitment of enabling a new age in patient care."

Michael Brown, Director, GE Research- HealthCare, ge.com

"I wanted to share what a great relationship we've started to build with MTEC, including several awards. The MTEC team and process for the award have significantly reduced administrative burden and paperwork, shortened timelines to award compared to other contract mechanisms, and provided knowledgeable staff. This is important because it allows our researchers to focus more on the science, and so we can provide military solutions to the field and to operational commands faster."

Colonel Vik Bebarta, MD: Director, Center for COMBAT Research, University of Colorado Anschutz Medical Campus

Member Impact in Ukraine

HUMACYTE®

Vascular injury is a leading cause of death and disability in military and civilian trauma. Humacyte's Human Acellular Vessel (HAV), an off-the shelf bioengineered blood vessel, is being used by Ukrainian surgeons to save lives and limbs by repairing vascular injuries resulting from shrapnel wounds, gunshots, and mine blast injuries. With \$6.8M in funding from USAMRDC through MTEC, Humacyte was able to propel its manufacturing platform development forward to build the first commercial-scale tissue engineering system.



A significant challenge for medics in the field is finding a sterile environment in which to operate. The SurgiField System is a disposable, sterile, inflatable bubble developed to protect patients from contamination in austere environments. MTEC's prototype acceleration award provided \$250K to the SurgiBox team to collect user feedback from healthcare providers using SurgiField on the front lines in Ukraine.



Evolution of MTEC

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MTEC Board of Directors

Technology

MTEC Leadership



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



Gautam S. Ghatnekar, Mark D. Breyen, Medtronic, Inc. VP PhD, Chairman and Research & Technology, CEO, Regranion, LLC Cardiac Implantables **Development Center**



Kent Kester, MD, FACP, DIDSA, FASTMH, VP and Head, Translational Medicine for IAVI



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



Bill Howell, President



Julia Martin, Chief Financial Officer



Dr. Lauren Palestrini, Chief Science Officer



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



Kathy Zolman, Chief of Consortium Operations



Dr. Susan Raymond,

Director of Strategic

Funding



Richard Satcher, Director of Commercialization

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Bill Evans, Treasurer



Jill Sorensen, Chief Development Officer



Rebecca Harmon, Chief Contracting & **Compliance Officer**



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2023 Strategic Goals



Tribute to CAPT (ret) Russ Keller

MTEC lost one of its founding partners who is remembered for his impact and proficiency in getting this endeavor off the ground and running. CAPT (ret) Russ Keller, a former Navy submariner, provided the initial impetus and continued drive to establish and improve the MTEC throughout his 6 years with the entity. Russ displayed infectious passion for the work. His wisdom and willingness to listen and analyze, moved the MTEC forward. As a military officer, he knew the mission needed to get done and worked hard in getting the infrastructure for success going early. He cared just as much for his staff as he did his family. The mission and people were his strong suits.

Russ was primarily responsible for the Advanced Technology International (ATI) portion supporting the MTEC's contracting, financial management, internal project management, and information management. He realized that this OTA was going to be unique from others. Its dual use and high scientific risks brought forth opportunities to assist organizations that were not present or available in other OTAs. He grasped this concept and helped to make it a reality, for which we are all grateful.

With time, Russ and I built a strong bond. Together, we made decisions that affected the goals and trajectory of the MTEC. Russ is sorely missed by myself and the MTEC family to which he so dedicated himself. For his service to the nation, the MTEC mission, and the people with whom he worked, we salute him.

Always in our thoughts.





2022 Highlights:

- 9 Solicitations, 62 awards, \$154.4M awarded
- 2 New funding sponsors added to the MTEC
- MTEC Ventures established
- Initiated Advanced Commercialization Services



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