Regenerative Medicine Initiative

Operation Iraqi Freedom, Operation Enduring Freedom and Operation New Dawn – otherwise known as the wars in Iraq and Afghanistan – have resulted in over 6,800 U.S. military casualties and more than 51,000 injuries. The use of improvised explosive devices (IEDs) during battle has led to a significant increase in blast-associated trauma, in particular, massive tissue loss. Although significant advances have been made to increase survival rates, those that survive often endure devastating and debilitating injuries to the unprotected areas of the body (face, neck, head, and limbs).

Regenerative medicine technologies hold great promise for treating those who are severely injured, both military and civilians. The field uses biological engineering approaches to restore the structure and function of damaged tissues and organs by stimulating the patient's own body to heal itself, or "regenerate." This provides a means to heal wounds, grow back limbs, and restore function with a biological solution. Areas of research include:

- Composite tissue regeneration (e.g., muscle, bone, fat, skin)
- Vascular repair (blood vessels)
- Regeneration of large nerve defects
- Regeneration of large bone defects
- Muscle protection/regeneration
- Severe burn treatment
- Control scar formation
- Modulation of the immune system
- Replace parts of the genitourinary system

The **Medical Technology Enterprise Consortium (MTEC)** is a newly formed nonprofit organization charged with bringing medical solutions to industry that protect, treat, and optimize warfighters' health and performance across the full spectrum of military operations, and to improve the quality of care for our veterans and, ultimately, all citizens. MTEC joins government agencies and private industry in a dedicated effort to push technological innovation through the "valley of death" between concept and viable product by funding the most promising advances and then supporting the transition to clinical use. Our organization's purpose is to efficiently align public priorities and resources with the best opportunities for transformational research and development. Formed in conjunction with the United States Army Medical Research and Materiel Command (USAMRMC), MTEC is working to connect promising regenerative medicine technologies with private sector interest to drive potentially high impact solutions toward final FDA approval and market production.

Our Research Goals

Currently, there is a lack of FDA approved, Good Manufacturing Practice (cGMP) methods to produce regenerative material to scale and quality that will support the emergence of these technologies. MTEC's primary objective is to bridge the gap in standardization and robust manufacturing with potential solutions that can drive industrial interest toward final FDA approval and market acceptance of regenerative medicine products. This focus falls into five major areas:

1. Developing universal, defined culture media;
2. Advancing bioreactor technology for cost-effective cell and tissue expansion;
3. Improving cell, tissue, and organ preservation technology;
4. Large-scale manufacturing for regenerative medicine products; and
5. Developing quality assurance strategies for regenerative medicine manufacturing.

Impact on the Wounded and Society

Regenerative medicine products offer significant improvements in the medical care provided to our wounded service members. These improvements can: replace missing or damaged parts of the body; reduce amputation rates; increase return to an independent, fully functional life and in so doing improve quality of life; and decrease short-term and long-term costs associated with restorative and rehabilitative or acute care.

Despite major advancements in the performance of prosthetic limbs in recent years, they are not a viable solution for all amputees, some of which opt for life in a wheelchair. Rather than having a separate - and oftentimes large, heavy, and cumbersome – artificial limb, the medical advances made through MTEC would promote regeneration of the individual's own limb. This impacts all facets of daily life – from getting out of bed in the morning without having to attach a prosthetic limb, to utilizing the touch feature of your iPad, to feeling the touch of a loved one's face or the ocean's waves at the tips of your toes.

How Can You Help?

These efforts have significant cost, and although the Government is supporting portions of this work, major private philanthropic engagement could dramatically accelerate progress. MTEC has the ability to work with foundations, corporations, and individuals whose goals align with our mission. MTEC's public-private partnership strategy shortens and smooths the development process, and brings innovation directly to military service members, veterans and civilians. Your philanthropic partnership will support the manufacturing of new regenerative medicine products for clinical use as well as assist in building an American-based industrial foothold which does not yet exist (employment and US-based market leadership).

The opportunity for joining a public-private research partnership whose vision is to bring new products from the bench to the market is here. Your commitment to a financial partnership with MTEC could play a crucial role in making this vision a reality.

For more information and assistance with making a donation or forming a partnership with MTEC, please contact:

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