

Vision Restoration & Rehabilitation Initiative



Soldiers in the battlefield are exposed to significant trauma through blasts, penetrating wounds and burns. Among the most prevalent injuries are those related to the eye, which account for 12-15% of all battlefield wounds (>15% of these result in removal of the eye). In the U.S. alone, 2.9 million people are visually impaired and 1.3 million are blind, of which over 50,000 are veterans. These significant numbers demand solutions because of the impact that vision loss has on an individual's quality of life.

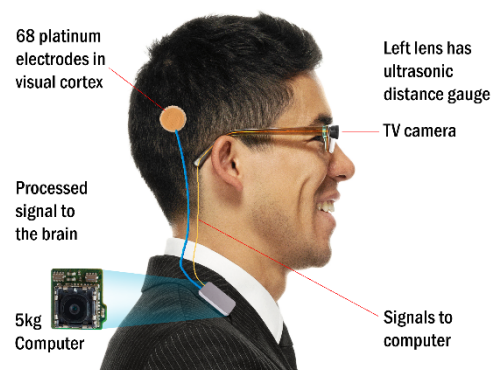
Medical Technology Enterprise Consortium (MTEC)

- Is a newly formed non-profit organization charged with bringing medical solutions to industry that protect, treat, and optimize warfighters' health and performance.
- Provides a public-private partnership strategy to push technological innovation through the "valley of death" between concept and viable product by funding the most promising advances and supporting the transition to clinical use.
- Serves as the lever that efficiently aligns public priorities and resources with the best opportunities for transformational R&D that benefit both injured military and civilians.
- Funds potential vision restoration solutions that can drive industrial interest toward final FDA approval and market production. These solutions fall into two major areas.

The Horus Restoration Project for those who suffer from severe traumatic ocular injuries

When the eye is destroyed, a visual prosthesis may be required as a means to capture and transmit sensory data to the brain. Early work has shown that stimulation of the brain can restore a level of vision to human patients. As the illustration to the right depicts, an image can be captured through camera-mounted glasses and forwarded to a computational device that translates stimuli to the brain through a microelectrode array implanted in the visual cortex. Though not a true aesthetic repair of the eye, this interim solution provides basic sight function, such as the ability to navigate, identify faces and objects, and read large print.

The Blind Can See



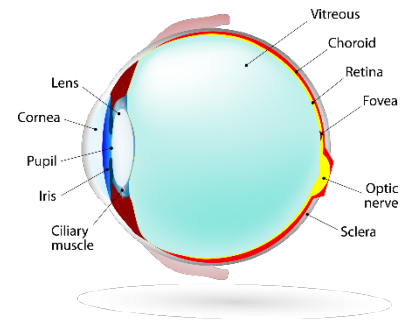
A visual prosthesis that stimulates the brain is not yet commercially available. Therefore, MTEC's goal is to enhance the existing prototype work by focusing on:

- Electrically-stimulated or optically-stimulated brain-machine interfaces
- Thalamic and cortical visual prostheses
- Technologies to provide data directly to the visual cortex
- Biocompatibility of microelectrode arrays in the brain
- Integration of the visual prosthesis' multiple components into a comprehensive system
- Performance of the system for the lifetime of the patient
- Safety and efficacy clinical studies of the system

For patients who are visually impaired or blinded from disease

The Horus Project addresses neither the restoration of the aesthetic features of the eye nor the repair of the functional components of the eye system. There are several private foundations working within these areas, and MTEC has a keen interest in leveraging their efforts for the military population. Though a longer and more difficult path toward total eye repair/replacement, MTEC is focusing on several topical areas related to degenerative diseases and occupational health incidences that mimic the civilian population's need, including:

- Optic nerve restoration/regeneration
- Optogenetics
- Biological (cell-based) solutions
- Assistive devices that employ sensory inputs other than vision
- Retinal prosthetics with the capacity to produce normal vision
- Optical stimulation for photolysis of caged excitatory neurotransmitters



How Can You Help?

These vision restoration efforts have significant cost, and although the Government is supporting portions of this work, major private philanthropic engagement could dramatically accelerate its transition to clinical use.



MTEC has the ability to work with foundations, corporations, and individuals whose goals align with our mission. There are several technologies at the forefront that are ready to enter the clinic where monetary requirements grow and risk increases. This is the purpose of MTEC – to help alleviate that gap and transition promising technologies through the “valley of death” and into the hands of competent, world-renowned industry leaders, who can take the final steps toward FDA approval, market production, and ultimately provide solutions to injured military personnel, veterans and civilians.

The opportunity for joining a public-private research partnership that brings 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 these medical solutions a reality.

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

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