Left to right: Joint DOD/VA Vision Center of Excellence (VCE) Director Colonel Donald Gagliano, M.D., with Stacey Choi, Ph.D. (New England College of Optometry) and Randy Kardon, M.D., Ph.D. (University of Iowa)

Left to right: Dr. Kardon, AEVR Executive Director James Jorkasy, and Tom Zampieri, Ph.D., of Blinded Veterans Association (BVA)

(University of Iowa) and Stacey Choi, Ph.D. (New England College of Optometry, NECO) were among twelve researchers who received a total of $11 million in Vision Research Program (VRP) grants from the DOD's Telemedicine and Advanced Technology Research Center (TATRC) in the combined FY 2009/2010 cycle. TATRC manages the Peer Reviewed Medical Research-Vision (PRMR–Vision) line

And we need to remember that every day, someone on the battlefield is experiencing a visual problem associated with TBI from blast injuries.

—Colonel Gagliano

research involves in vivo retinal imaging to detect microscopic changes in the retina—the photosensitive tissue at the back of the eye—to diagnose TBI and facilitate earlier intervention to improve visual outcomes. Dr. Choi is using Adaptive Optics (AO) technology that was initially developed for military use and was then applied to the space program. AO corrects for distortions in optical imaging systems and essentially "supercharges" it, so in combination with current retinal imaging systems such as Optical Coherence Tomography (OCT) and Scanning Laser Ophthalmoscope (SLO), it can detect changes down to the cellular level. Due to its sensitivity, AO retinal imaging may be especially valuable as a diagnostic tool in cases of mild TBI or in situations where a blast was too weak to cause damage detectable by standard screening standards, yet visual symptoms exist. As with Dr. Kardon's research, Dr. Choi's ultimate aim is to develop a compact battlefield-ready instrument that can diagnose TBI in theatre. "Once validated, this system could also find applications diagnosing civilian TBI from various injuries, as well as several retinal and optic nerve diseases," stated Dr. Choi.

See back page for details about PRMR-Vision funding

Left to right: Francis McVeigh, O.D., F.A.A.O. from the DOD's TATRC with Dr. Choi and David Danielson from the AOA

Left to right: AEVR Director of Education David Epstein with Mary Lawrence, M.D., Deputy Director of the VCE

Dr. Choi answers questions from Christian Lyons, a Defense Fellow in the office of Cong. Michael McCaul (R-TX)

Dr. Kardon made visits with the Iowa delegation, including (left) Tom Buttry in the office of Senator Tom Harkin (D-IA), who serves on the Senate Defense Appropriations Subcommittee

NAEVR Requests FY2012 PRMR-Vision Funding at $10 M, Cites Statistics

Traumatic eye injury from penetrating wounds and TBI-related visual disorders ranks second only to hearing loss as the most common injury among “active” military:

—Traumatic eye injuries account for upwards of 16 percent of all injuries in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF).

—Eye–injured soldiers have only a 20 percent return-to-duty rate as compared to an 80 percent rate for other battle trauma injuries.

—The VA estimates that 43,000 OEF/OIF veterans have been diagnosed with eye disorders, including TBI–related visual disorders.

—The VA also estimates that upwards of 70 percent of all TBI patients experience short- or long-term visual disorders, including double vision, sensitivity to light, inability to read print, and other cognitive impairments.

Programmatic Committee that managed the awards, stressed that the VRP has attracted the best and brightest of researchers to tackle problems. “The PRMR–Vision line, and the VRP awards it funds, is money well spent,” he stated, adding that “and we need to remember that every day, someone on the battlefield is experiencing a visual problem associated with TBI from blast injuries. These include loss of field of vision in one or both eyes, light sensitivity (photophobia), and uncoordinated eye movements (e.g., double vision), with one or more of these conditions occurring short– or long-term in upwards of 70% of soldiers with TBI.”

Dr. Kardon, who is funded by the VA, DOD, NEI, and private funding organizations, emphasized that, without PRMR-Vision funding, he likely would not be conducting research in that arena. However, he has applied aspects of his larger research portfolio to the problem—better diagnosing TBI–related vision problems—through his research into using the brain's natural reflexes to visual stimuli. These include the pupil's light reflex (contractions of the pupil based on amount of light sensed by the eye), natural eye tracking of visual targets, and the activation of eyelid muscles in response to light. One goal is to develop a portable, handheld device—perhaps even through a smartphone application—to quickly and inexpensively analyze the pupil's reaction to light. “Since about 70 percent of the brain's nerve connections are engaged in visual processing, a soldier could technically have 20/20 vision yet have visual disorders since the processing is perturbed. Studying the body's natural reflexes provides one way of determining the extent of the problem.”

Dr. Choi noted that the award is her first major grant and first DOD award for NECO. Her