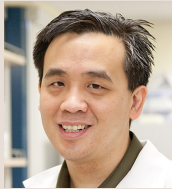


MILITARY RELEVANCE

- *Approximately 6,000 active-duty Service Members and nearly 56,000 Service Member beneficiaries were diagnosed with a reportable TBD between 2006 and 2020.*
- *Lyme disease accounts for approximately 80% of TBDs diagnosed in Service Members and their beneficiaries.*³



Pathogen-Host Molecular Biosignature Lyme Disease Diagnostic Assay **Charles Chiu, M.D., Ph.D.,** **University of California San Diego**

Researchers are working to develop a Lyme disease diagnostic assay capable of accurately differentiating acute Lyme disease from other acute illnesses that may present with similar symptoms, such as influenza or sepsis. Genes that are differentially expressed in acute Lyme disease patients, as compared to non-Lyme and healthy controls, were identified, leading to the discovery of a Lyme disease-specific biomarker signature. Using machine learning analysis of this signature, a predictive model was developed for distinguishing blood samples of acute Lyme disease patients from healthy patients or those suffering from other acute illnesses. The ability to diagnose Lyme disease at all stages of infection using a non-invasive, specific, sensitive, rapid assay would improve overall patient care and result in prompt treatment that could mitigate disease progression and limit severity.



Warfighter Adaptive Barrier Controlled-Release Device (AB-CRD) for Active Protection Against Ticks **Noel Elman, Ph.D.,** **GearJump Technologies, LLC**

Current TBD prevention strategies for Service Members in the field rely on permethrin treatment of uniforms, which wanes over time, and/or frequent application of tick repellent, which may be impractical. Researchers are developing an AB-CRD that uses micro-electro-mechanical systems technology to provide controlled and sustained release of a low toxicity tick spatial repellent. The design includes remote wireless control and programming and allows for receipt of device updates. Because it is compact, the AB-CRD can be worn by the Soldier or affixed to mobile infrastructure, providing an additional line of defense against tick bites, thus reducing TBD incidence.



Monica White - Patient, Mother and Wife Living with Lyme

Monica White has spent the past 15 years caring for herself, her two children, and her husband, all of whom are infected with Lyme disease and multiple other TBDs. In their search for care, Monica and her family met roadblocks, including misdiagnosis, denied coverage, and restricted access to Lyme disease testing. Through her own experiences and advocacy work, Monica developed a thorough understanding of the challenges faced by those suffering from TBDs: limitations in or lack of diagnostic assays, lack of treatments, the need for expanded research, and the physical, emotional, psychological, financial, and social devastation that patients and their families experience. As a TBDRP Programmatic Panel member, Monica is committed to helping to fund the best research to combat Lyme and other TBDs, bringing hope to patients and caregivers.

“What cohort of the American public is exposed to more global tick-borne illnesses than our Service Members and military families? After being medically retired from a career as a fighter pilot due to ‘chronic systemic tick-borne illness,’ I needed a new mission. The TBDRP allows me to be a part of the solution by sharing my own experience and helping to advance the science as a consumer peer reviewer. The patient-centered approach of the CDMRP is unique among federal funding agencies, and the TBDRP ensures that the voices of tick-borne illness patients are heard. This program gives me hope for bridging the gap between basic research and urgent patient needs.”

Colonel Nicole Malachowski (USAF, Ret.) Former F-15E Fighter Pilot



³ Data from the Armed Forces Health Surveillance Branch for the years 2006-2020.