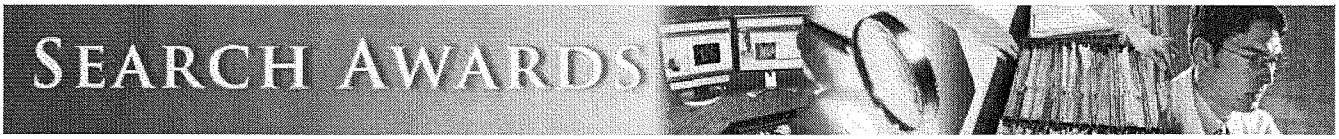

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Biomarker Discovery in Gulf War Veterans: Development of a War Illness Diagnostic Panel

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Institution Receiving Award: BAYLOR UNIVERSITY
Program: GWIRP
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PUBLIC ABSTRACT

Public Abstract

Background: Twenty years after Operation Desert Storm, a substantial number of military Veterans who served in that conflict continue to suffer from a complex of multiple symptoms not explained by established medical or psychiatric diagnoses. This illness is commonly known as Gulf War illness (GWI) and is characterized by symptoms that typically include persistent headaches, memory and cognitive difficulties, widespread pain, unexplained fatigue, gastrointestinal problems, and other difficulties. A particularly difficult aspect of this problem for Veterans, as well as their healthcare providers, is the lack of a diagnostic test to objectively identify who does or does not have GWI. Very little research has focused on developing a blood test that can, in the near term, provide an objective tool for diagnosing GWI in healthcare and research settings.

In recent years, sophisticated techniques have been developed that use test results from multiple blood assays, analyzed together using a "multiplex" testing platform, to provide blood-based biomarkers, or "biological signatures" for medical conditions that present diagnostic challenges. These techniques have been used to assist in accurate diagnosis of complex conditions such as Alzheimer's disease and schizophrenia.

Research Strategy: The proposed project will use state-of-the-art multiplex biomarker discovery techniques to evaluate a broad panel of blood measures simultaneously--including diverse chemical messengers associated with neurological, inflammatory, hormonal, and coagulation processes thought to contribute to the symptoms of GWI. These measures will first be compared in two independent groups of 1991 Gulf War Veterans both of which include Veterans with GWI and healthy Veterans. The subgroup of assays found to most clearly identify Veterans with GWI in the two initial samples will then be "shrink wrapped" into a more refined, GWI-specific assay panel, to be tested in a third "validation sample" of Gulf War Veterans. Results in the third sample will provide an independent assessment of the degree to which the assay panel accurately identifies Veterans with GWI and can provide an objective basis for distinguishing GWI subgroups of importance. This biomarker discovery approach holds particular appeal, since an identified assay panel that successfully identifies individual Veterans with GWI can be developed, in the near term, for use as a diagnostic tool in the clinical setting that uses a small blood sample, at a relatively low cost.

Impact: If successful in developing a GWI-specific multiplex panel that identifies GWI with sufficient accuracy, the project will provide a major step forward for improving medical evaluation and care of Veterans with GWI. It would also advance other aspects of GWI research, for example, by providing an objective measure for monitoring the effects of treatments evaluated in clinical trials. More generally, it would assist in legitimizing GWI as a medical condition that is diagnosable with an objective biological test.