The economic stimulus package of the U.S. Government includes a large research budget to the National Institutes of Health to study biomarkers for various health disorders. A major health problem is traumatic brain injury, particularly diagnosis and treatment of diffuse brain injuries. The severity of these injuries may range from mild concussion to life threatening diffuse axonal injury, yet adequate diagnostic tests do not exist to characterize their extent and development over time. In answer to the stimulus package, your task is to write a proposal to use biomarkers to assess diffuse brain injury in an animal model or in patients. In your proposal combine the use of biomarkers in blood and/or cerebral spinal fluid with at least one other biomedical engineering tool to better diagnose and characterize diffuse brain injuries. Other diagnostic tools can include physiological measurements, imaging or smart sensors. Include a test protocol that investigates mild to severe diffuse brain injuries and the sensitivity and specificity of the proposed measures.