Mathematical Modeling of Inflammation Following Traumatic Brain Injury

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Technology description

Background

Traumatic brain injury (TBI) is a serious public health issue for Americans. Each year, TBI contributes to a substantial number of deaths and cases of permanent disability. A TBI is caused by a bump, blow or jolt to the head or a penetrating head injury that disrupts the normal function of the brain. The severity of a TBI may range from "mild" to "severe". An estimated 1.7 million TBI-related deaths, hospitalizations, and emergency department visits occur in the U.S. each year. Nearly 80% of these individuals are treated and released from an emergency department. TBI is a contributing factor to a third (30.5%) of all injury-related deaths in the United States, or about 52,000 deaths annually.

Technology

The present invention details a method of analysis of injury biomarker data, leading to the creation of patient-specific, mechanistic computational simulations of inflammation and outcome geared towards diagnosis and rational design of therapeutic strategies. This invention, based on the same principles proven in the setting of sepsis/trauma and wound healing, offers the potential to diagnose and prognosticate individual outcomes and to serve as a platform for rational drug/device design for traumatic brain injury.

Application area

* Diagnosis of traumatic brain injury

Advantages

* Offers the potential to diagnose and prognosticate individual outcomes
* Serves as a platform for rational drug device design for traumatic brain injury

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