Novel Biomarkers for Early Detection of Sepsis

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Technology description

Novel biomarkers that may be used to provide early diagnosis of sepsis.
Because bacterial infection elicits an immune response in the patient, the immune response can be identified in patients who are suspected of having a bacterial infection and the patient can be placed on an antibiotic regimen early in the infection cycle with monitoring of response to gain early control of the infection and minimize damage. The proposed biomarkers can be integrated into commercially available immunochromatographic kits as a rapid prescreen assay for sepsis.

Background

Sepsis, the body’ s extreme response to an infection, affects patients from a broad demographic spectrum and across many disease states. Cases include the very young and elderly, the immunocompromised, those with cancer, those with trauma, and other critically ill patients with co-morbid conditions. The Centers for Disease Control and Prevention estimates that more than 1.5 million people get sepsis each year in the Unites States alone. Successful clinical intervention during sepsis depends on timely diagnosis that enables judicious administration of appropriate treatment regimens. Blood cultures remain the diagnostic gold standard for identifying bloodstream infections, yet suffer from the long lag time and low sensitivity in obtaining a positive result. The diverse range of microbial agents that cause sepsis, sites of injury, and patient heterogeneity further confounds understanding of the pathogenesis of this disease. So far, there are approximately 180 distinct potential biomarkers of sepsis known, although the high number of targets has limited their prognostic value. Elevated procalcitonin (PCT) and C-reactive protein have been used most widely, though have limitations in distinguishing sepsis from severe inflammatory disease, motivating continued search for biomarkers. Over 100 customer interviews validate an urgent market need for a biomarker for definitive early diagnosis of a bacterial infection, as well as for antibiotic stewardship in sepsis.

Technology Description

Researchers at the University of New Mexico have discovered novel biomarkers that may be used to provide early diagnosis of sepsis. Because bacterial infection elicits an immune response in the patient, the immune response can be identified in patients who are suspected of having a bacterial infection and the patient can be placed on an antibiotic regimen early in the infection cycle with monitoring of

response to gain early control of the infection and minimize damage. The proposed biomarkers can be integrated into commercially available immunochromatographic kits as a rapid prescreen assay for sepsis.

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Application area

Capable of rapidly and specifically identifying sepsis
Useful in antibiotic stewardship
Discriminates between sterile inflammation and sepsis
Effective temporal indicators of bacterial induced immune response
Stimulates differentiation of monocytes to dendritic cells
Applications in cancer therapeutics and diagnostics

Institution

The University of New Mexico

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