

Sophi™

Detection of Procalcitonin levels in serum ^{RUO}

Sophi™ affinity chip assay that measures procalcitonin blood levels and helps diagnose bacterial infection.

● BACKGROUND

Sepsis, a life-threatening state caused by a dysregulated host-response to infection, is a worldwide highly prevalent syndrome, associated with significant morbidity and mortality. Important aspects of sepsis management are early diagnosis that can lead to specific treatment in the first few hours of triage. Unfortunately, in complex clinical situations, the correct diagnosis of sepsis and differentiation from non-infectious causes can be challenging. The use of blood biomarkers has great potential to improve sepsis care. Biomarker assays should be able to complement the clinical judgement and interpretation of available prognostic and diagnostic tests, to improve patient's care. The use of the host-response and blood infection protein marker

procalcitonin (PCT) has gained much attention and information about its blood levels is used for guidance of antimicrobial therapies in patients with presumed sepsis. PCT synthesis is different in different inflammatory states. In healthy individuals, PCT is not detectable due to the fact that the protein is not released into the blood in absence of systematic inflammation. PCT synthesis is induced by bacterial infection in almost all tissues and is then detectable in patient serum. This response is triggered by bacterial toxins, such as endotoxin and some cytokines (IL-6, IL/1 Beta, TNF-alpha). Cytokines released during viral infections that inhibit the production of TNF-alpha usually do not induce PCT synthesis, making a useful clinical distinction.

● TEST

Serum samples (1uL) are incubated on a Sophi™ target array with immobilized anti-PCT antibody. After incubation, the chip is washed three times for 5 min in PBS buffer and 1 min in deionized water and allowed to dry at room temperature. MALDI matrix is applied, and the chip is placed into the Sophi spectrometer. After

the analysis is performed by Sophi™, the PCT level is determined automatically by the software based on previously performed and stored calibration. Serum calibrants with recombinant PCT spiked at different levels are used to construct the calibration curve.



info@massspecmedical.com



www.massspecmedical.com
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● CLINICAL USE

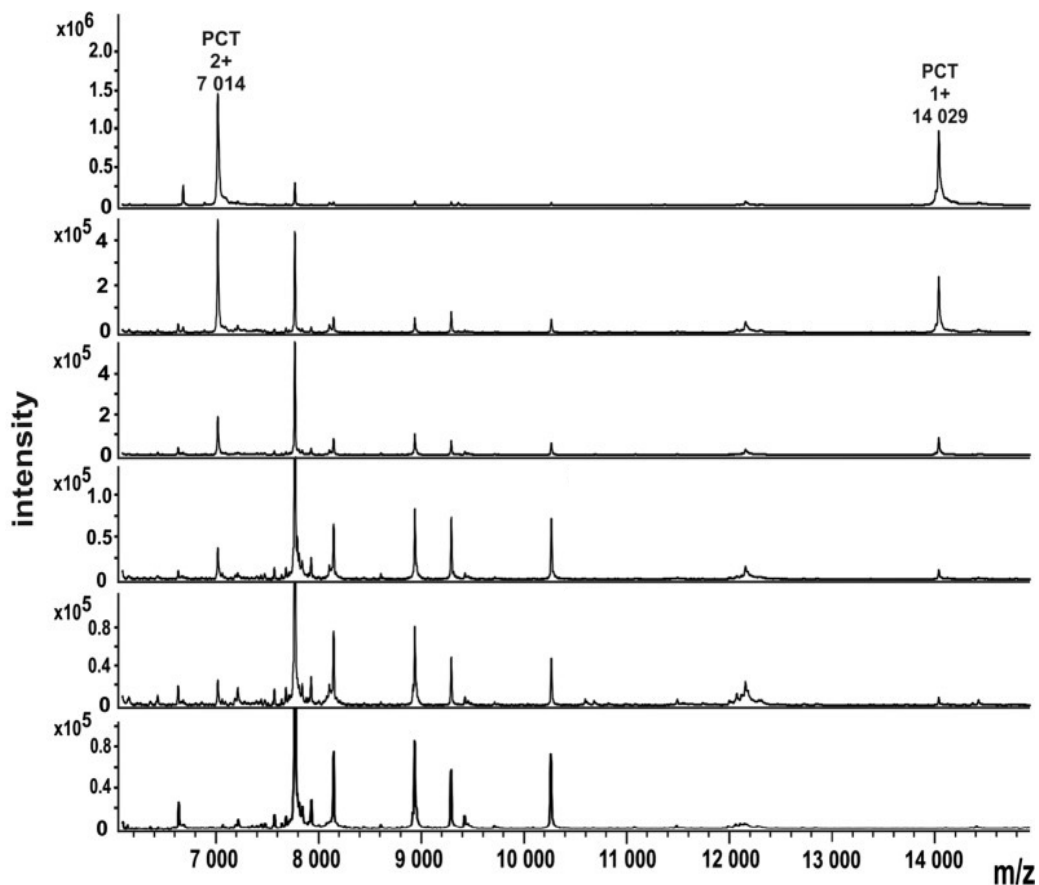
The PCT levels in serum help determine severe septic states. PCT level per se cannot be used to determine a specific pathogen, but the information may be useful to

estimate the probability of a severe bacterial infection and to design proper therapy.

● DATA EXAMPLE

PCT detection results obtained by **Sophi™** using mass spectrometry chips. Figure shows sera samples spiked by recombinant PCT at different concentrations

levels (decreasing from top to bottom). The very bottom panel shows spectrum of serum without spiked PCT (blank).



Detailed information

Dvorak et al.: The rapid detection of procalcitonin in septic serum using immunoaffinity MALDI chips, Clin Proteomics. 2023, 20 (1) 20.
doi: 10.1186/s12014-023-09410-3.



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