The Sepsis Problem

Sepsis is a life-threatening condition that arises when the body’s response to an infection injures its own tissues and organs. Sepsis can kill in hours and is the leading cause of hospital deaths in the US.

Historically, sepsis diagnosis has focused on the invading pathogen. Yet the host immune system holds the key to unlocking better understanding, diagnosis and treatment of patients suspected of sepsis.

What usually happens (i.e. Normal Infection)
Controlled, effective immune response at the site of an infection.

When SEPSIS happens
Uncontrolled amplification of the immune response throughout the whole body.

The [septic immune response] is the immunological equivalent of bombs, detonations, and explosions. — Lewis Thomas, 1974

Understanding Host Response

Picking up signals
Immune cells contain large amounts of RNA – a measurable genetic material that is a snapshot of the immune conversation.

Interpretation
Mathematical algorithms are used to bring gene-based information together in a meaningful interpretation of the patient’s septic immune response.

Likelihood of Sepsis
>80%

Today’s Challenges of Sepsis Diagnosis

Traditional Sepsis Diagnosis: PATHOGEN DETECTION & IDENTIFICATION

TIME: Blood culture has been used to diagnose sepsis for over half a century, but it is slow and inaccurate.

RESULTS: Informative result in 20% to 40% of cases

LIMITED ACCURACY

PATHOGEN DETECTION

LIMITED ACCURACY

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Future: How Host Response Can Aid Sepsis Diagnosis

Solution: HOST RESPONSE INTERPRETATION

TIME: Host response genes are easily measured and test results available within a clinically-actionable window of time—within minutes to hours.

RESULTS: Informative result in 100% of cases

100% RESULTS: Informative result in 100% of cases

HIGH ACCURACY

PATHOGEN DETECTION

HOST RESPONSE

INCREASED CERTAINTY

Clinicians agree that a fast and sensitive alternative is urgently needed to combat rising sepsis incidence, healthcare costs, and antibiotic-resistant superbugs.

Benefits of Early, Accurate Diagnoses

This is expected to lead to:

- decreased mortality and morbidity
- decreased length of stay
- decreased antibiotic budget
- decreased ancillary diagnostic budget
- reduced antibiotic resistance

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Patients stay longer in hospital and have more complications and procedures
Length of stay for non-sepsis is 3.4 days versus 7 days for sepsis patients. An ICU bed costs over $5,000 per day. The costs are even higher for HAI cases.

Costs of Untimely, Uncertain Sepsis Diagnoses

Overuse of antibiotics & superbug incidence is on a steep rise
Antibiotic resistance costs the US over $75 billion each year and is a contributor to Hospital Acquired Infections (HAIs).

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