Washington University in St. Louis
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RAPID STREP THROAT DIAGNOSTIC USING HOST GENE EXPRESSION ANALYSIS

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Technology Description

Researchers in Prof. Gregory Storch's laboratory have developed a molecular assay that utilizes the patient/host gene expression pattern to rapidly identify acute group A *streptococcus* (GAS) infection in patients with pharyngitis (sore throat) to help guide appropriate treatment decisions.

Clinicians must determine the underlying cause of a sore throat in order to determine the appropriate treatment – prescribing antibiotics for patients who will benefit (those with symptomatic bacterial infections) but avoiding unnecessary antibiotics for those who will not (asymptomatic GAS carriers and those with viral infections). However, current GAS diagnostics, including antigen detection, PCR and bacterial culture, cannot distinguish patients with acute GAS infections from asymptomatic carriers. This can lead to overuse of antibiotics because ~10-20% of children have GAS without pharyngitis. This new technology solves this problem by measuring the host response instead of detecting the pathogen itself. Specifically, the patient's transcriptomic profile produces a gene expression signature that can distinguish bacterial vs. viral infection as well as symptomatic vs. asymptomatic colonization. Using this test could enable faster, more appropriate targeting of antibiotic therapy to curb unnecessary antibiotic use and prevent further development of antibiotic resistance.

Stage of Research

The inventors performed transcriptome RNA sequencing on blood from 37 children and identified the gene expression patterns for GAS pharyngitis vs. asymptomatic carriers and viral pharyngitis. They found a panel of 13 genes that could distinguish symptomatic GAS from the other samples.

Applications

- **Infectious disease diagnostics** – molecular analysis of host response to determine the cause of and the appropriate treatment for pharyngitis (sore throat)

Key Advantages

- **Minimizes unnecessary use of antibiotics**:
  - distinguishes patients bacterial infection vs. viral infection
  - distinguishes patients with symptomatic group A *Streptococcus* infection from asymptomatic carriers who will not benefit from antibiotic treatment

Patents: Application Pending

Related Web Links: Storch Profile