Currently, when a septic patient comes to the emergency department the goal is to determine the source, bug, and appropriate antibiotic using blood cultures. While waiting for blood culture results, broad spectrum antibiotics are administered in the first hour in order to identify and employ a targeted therapy. This is a problem.

Relying on blood cultures involves long wait time for results, low sensitivity and specificity, and limited viral and fungal identification.

Antibiotic resistance
Severe side effects
Under-treatment

Ultrasensitive, polymerase chain reaction (PCR) detection system couples standard PCR primers to gold nanorods (NR-PCR).

This method is at least 50 times more sensitive than the most sensitive PCR detection techniques currently available with near single molecule detection.