NANOROD-PCR
Rapid, ultrasensitive, culture-free detection of bacteria and antibiotic susceptibility testing

UNMET NEED
Currently, when a septic patient comes to the emergency department the goal is to determine the source, bacteria, 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 as soon as possible. This is a problem.

Relying on blood cultures involves long wait time for results, low sensitivity and specificity, and limited viral and fungal identification. A “one-size-fits-all” approach can result in antibiotic resistance, opportunistic infection, life threatening side effects, and undertreatment of the critically ill.

SOLUTION
MCIRCC members are developing an assay that utilizes nanotechnology to dramatically improve the sensitivity and specificity of a polymerase chain reaction (PCR) detection system to detect bacteria in whole blood without culture. The ability to rapidly detect bacterial DNA will allow physicians to prescribe the “right drug for the right bug” for septic patients.

COMPETITIVE ADVANTAGE
There are no currently commercially available culture-free bacterial detection systems for whole blood with this level of sensitivity and specificity. The Nanorod-PCR provides rapid diagnostics in two hours, rapid antibiotic susceptibility testing, and multiplex capability to reduce cost.

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