# White Blood Cell Assay for Determining Risk of Sepsis and Other Inflammatory Disorders

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## Technology description

Sepsis is a systemic inflammatory response to infection that often leads to low blood pressure, organ failure, and death. Components of Gram-negative bacterial cell walls, such as endotoxin, are a potent trigger of sepsis, and high levels of endotoxin in the blood cause many of its symptoms. The nucleotide receptor $P2X_7$ likely modulates the response of macrophages to endotoxins and may be an indicator of sepsis. UW-Madison researchers have developed a method of rapidly assaying $P2X_7$ pore activity in white blood cells within a sample of whole blood. The white blood cells are labeled and then depolarized in an isotonic depolarizing solution. Next, the cells are mixed with a dye and a $P2X_7$ agonist to activate the pore activity of $P2X_7$. Finally, the cells are mixed with a divalent cation to deactivate $P2X_7$'s pore activity. To quantify $P2X_7$ pore activity, the amount of dye taken up by the labeled cells is compared to the dye uptake in control cells without the $P2X_7$ agonist. The amount of activity may help indicate prognosis and suggest a treatment plan for patients at risk for sepsis or other inflammatory disorders.

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing an assay for identifying individuals with novel genetic mutations related to inflammatory disorders.

## Application area

Identifying individuals with novel genetic mutations related to inflammatory disorders including septic shock, tuberculosis, chronic lymphocytic leukemia and asthma

Assists physicians in making rapid prognoses and guiding therapeutic interventions for patients at risk for certain inflammatory disorders

## Advantages

Requires much smaller volume of whole blood than current assay

Requires only standard equipment and no special lab skills

Amenable to automation and high throughput processing

More sensitive, reliable and robust than current methods

No need to isolate and purify white blood cells

## Institution

Wisconsin Alumni Research Foundation

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