

BLOOD-BASED PROGNOSTIC MARKER FOR RESPIRATORY DISTRESS FROM INFLUENZA AND OTHER VIRAL INFECTIONS

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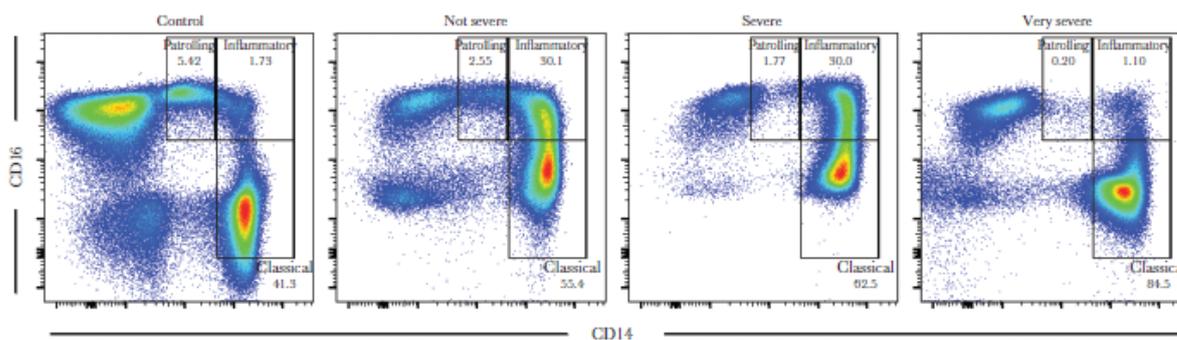
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Technology Description

A team of researchers at Washington University has discovered an easily-measured, blood-based marker that could provide an early indicator to identify patients who will develop very severe disease following a viral infection. This immune cell marker for acute respiratory distress syndrome (ARDS) can be measured with a standard flow cytometry or ELISA assay to help clinicians identify which patients will require aggressive treatment such as mechanical ventilation.

Currently the survival rate from ARDS is low and there is no single predictor for ARDS in patients with respiratory infections. This new technology is based on the discovery that influenza patients who required mechanical ventilation following a viral respiratory infection had lower concentrations of inflammatory monocytes (CD14⁺⁺ CD16⁺). Importantly, this early cellular immune response is evident in peripheral blood during the critical first week of infection. Therefore, it has the potential to be used as a prognostic marker predict the course of the disease before the onset of very severe symptoms and improve patient outcomes.



Monocyte populations

in relation to severity of illness: Representative flow cytometry plots show depleted inflammatory monocytes (CD14⁺⁺CD16⁺) in patients with very severe illness requiring ventilation (far right) whereas infected patients with less severe disease had increased inflammatory monocytes compared to uninfected controls. These results are based on a prospective study of patients with influenza who presented in the emergency department within a week of onset of symptoms.

Publication: Turner, J. S., Lei, T., Schmitz, A. J., Day, A., Choreño-Parra, J. A., Jiménez-Alvarez, L., ... & Mudd, P. A. (2020). [Impaired cellular immune responses during the first week of severe acute influenza infection](#). *The Journal of Infectious Diseases*.

Applications:

- **Prognostic for respiratory infection:**
 - flow cytometry or ELISA-based testing
 - triage and plan treatment strategy by identifying patients likely experience acute respiratory distress that

requires ventilation

Key Advantages:

- **Early indicator** – differential monocyte level detected an average of 3.5 days after the onset of symptoms
- **Simple, single marker test** – straightforward prediction from a biomarker easily measured in blood

Patents: Application pending

Related Web Links: [Mudd Profile](#)