UNIVERSITY OF LIVERPOOL

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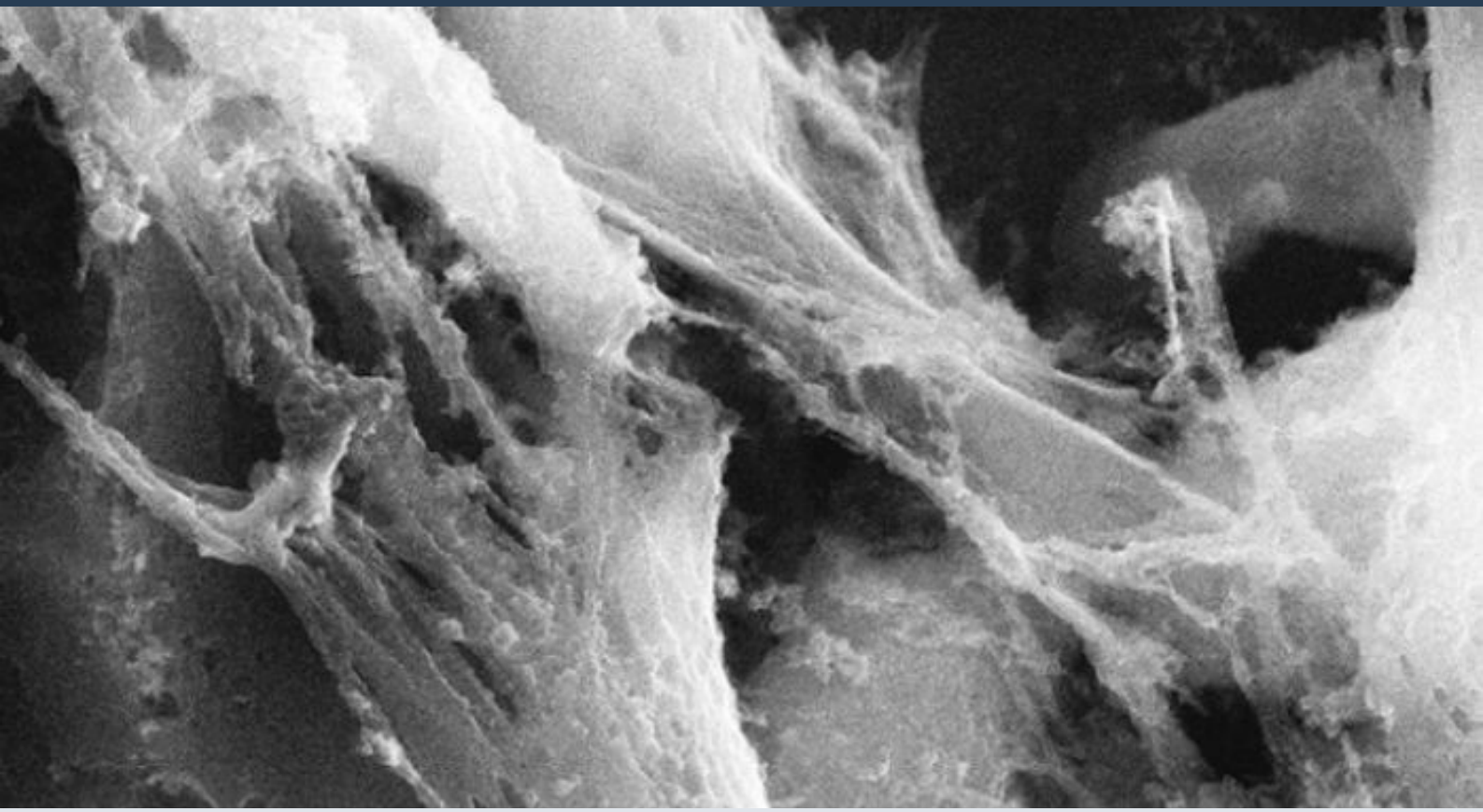
Neutrophil Extracellular Traps Formation Assay for ICU Precision Medicine

An assay of patient NETs formation capacity, predicting development of disseminated intravascular coagulation and mortality



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IP Status

Know-how based

Seeking

Development partner, Commercial partner

About **University of Liverpool**

By facilitating access to our expertise, facilities and networks, the University of Liverpool offers the means to transform ideas into creative solutions, improved performance, new technologies, strategies, applications, products or skills.

Background

Neutrophils are the first line of defence against bacterial infection and formation of neutrophil extracellular traps (NETs) is an important protective mechanism. However, NETs can also cause harm by exposing cytotoxic histones and promoting intravascular coagulation. Although increasingly considered as important therapeutic targets, there is currently no robust measure of NETs formation to inform clinical care and enable precision medicine in patients on the intensive care unit (ICU).

Tech Overview

Researchers at the University of Liverpool have established a novel assay by incubating patient plasma with neutrophils to directly induce and measure NETs-formation. This is different from currently available assays, which primarily detect NETs-breakdown products. Using this assay in a prospective cohort of 341 ICU patients, the researchers found that the degree of NETs formation is significantly associated with disease severity and independently predicted development of disseminated intravascular coagulation (DIC) and mortality.

This assay also enabled identification of interleukin-8 (IL-8) as a major factor that drives NETosis through mitogen-activated protein kinase (MAPK) pathway activation. Inhibiting IL-8 or MAPK significantly reduced NETs formation. Therefore, this assay can inform on the *in vivo* capacity for NETs formation and its inducing factors to enable improved therapeutic targeting strategies for ICU patients.

Benefits

- Directly measures NETs-formation
- Predicts DIC development and mortality
- Enables targeted treatment and personalised medicine

Applications

- ICU patient care
- Precision medicine