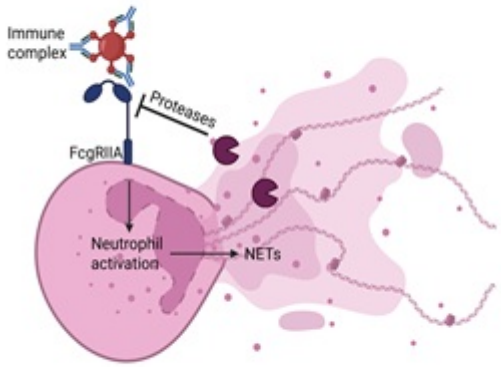
Diagnostics for Autoimmune Diseases

The technology offers a diagnostic kit that uses existing antibodies targeting innovative biomarkers for detecting immune complexes, neutrophil extracellular traps (NETs), and FcgRIIA shedding, which are involved in immune complex-driven inflammation. This innovation offers new insights for diagnosing, prognosticating, and treating autoimmune diseases.



Technology ID

BDP 7811

Category

Therapeutics/Immunology
Selection of Available Technologies
Diagnostic

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What is the Problem?

Autoimmune diseases such as systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA) involve complex immune responses that are difficult to diagnose and manage effectively. One of the key challenges is identifying specific biomarkers that can accurately reflect the underlying immune processes, such as neutrophil activation. Current diagnostic methods often lack precision and fail to capture the dynamic nature of these immune responses, as well as the underlying disease heterogeneity, leading to suboptimal treatment strategies. As a result, there is a need for improved diagnostic methods and personalized medicine for autoimmune diseases to enable early treatment, ultimately enhancing long-term quality of life.

What is the Solution?

The diagnostic kit utilizes existing antibodies to detect innovative biomarkers of immune complex-mediated neutrophil activation and neutrophil extracellular trap (NET) formation. During immune complex-mediated NET formation, immune complexes trigger NET formation by binding to FcgRIIA on neutrophils, inducing a cell death process in which the neutrophils release web-like structures composed of DNA and proteins. This contributes to inflammation and tissue damage. Further, upon activation, neutrophils release proteases cleaving FcgRIIA, skewing neutrophils towards a NET-forming inflammatory phenotype with limited phagocytic capacity. By quantifying levels of FcgRIIA shedding, immune complexes, and NETs, this diagnostic kit can provide a more accurate and dynamic picture of neutrophil activation. Altogether, these diagnostic technologies can lead to better diagnosis and monitoring of autoimmune inflammatory diseases, allowing for earlier intervention.

What is the Competitive Advantage?

Greater Specificity: This diagnostic kit targets specific biomarkers of neutrophil activation, providing a more precise assessment of immune activity compared to traditional methods that may lack specificity.

Early Detection: By identifying early signs of neutrophil activation and NET formation, the kit enables earlier diagnosis of autoimmune diseases, which is crucial for timely intervention and better patient outcomes.

Targeted Treatment: Improved understanding of immune mechanisms enables the development of more effective and targeted therapeutic strategies.

Broad Applicability: These biomarkers can be used across various autoimmune inflammatory diseases, enhancing their utility and market potential.

Patent Information:

US20210215692A1

References

1. Lood, C., Arve, S., Ledbetter, J., Elkon, K. B.(2017) , https://rupress.org/jem/article/214/7/2103/52201/TLR7-8-activation-in-neutrophils-impairs-immune, https://rupress.org/jem, 214, 2103-2119