Quanterix™

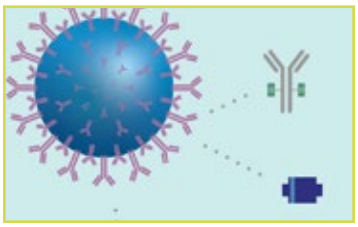
Industry leader in ultra-sensitive biomarker detection, Simoa precision instruments, wide-ranging menu of assay kits, and custom assay development services.

Phone: **+1.617.301.9400** Email: **sales@quanterix.com**

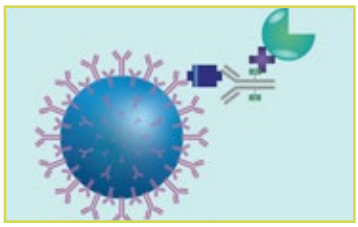
Evaluate the effect of autoantibodies by measuring baseline IFNα and cytokines with Simoa® technology

Autoantibodies are known to be involved in systemic lupus erythematosus and other autoimmune diseases. More recently, severe COVID-19 patients were also shown to harbor auto-antibodies against type I interferons. It is important to be able to quantitate the extent of the action of these autoantibodies in neutralizating or stabilizating inflammatory molecules. The difficulty arises when circulating levels of these molecules are so low that standard techniques are not suited for this evaluation. The digital counting of single molecules by Simoa bead technology allows quantitation of baseline levels of IFNα and cytokines, enabling researchers to evaluate the magnitude of action of autoantibodies.

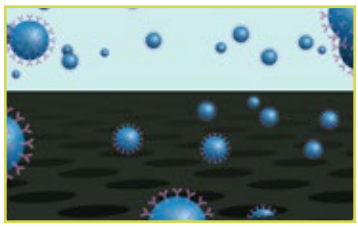
TECHNOLOGY OVERVIEW



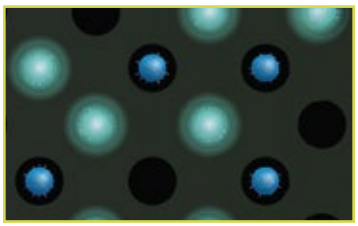
1 Beads, consisting of paramagnetic particles coupled with antibodies that bind to specific targets, are added to a sample. Target-specific biotinylated detection antibodies and a streptavidin reporter enzyme conjugate are subsequently added.



2 The goal is to form an immunocomplex consisting of a bead, analyte, detection antibody, and reporter enzyme.



3 The sample is loaded onto a disc with ~240,000 microwells. Each microwell is sized to admit one, and only one, bead. This allows for ultrasensitive detection of analyte.



4 The presence of a bound protein is indicated by a fluorescent signal from the bead. Results are digital, meaning each bead either contains an analyte, along with the detection antibody, or it doesn't.

5 These results can be viewed and analyzed on the system or exported to commonly used LIMS system.

RELEVANT ASSAYS KITS

Simoa® IFNα Advantage Kit
Part#100860

Simoa® IL-2 Advantage Kit
Part#101605

Simoa® IL-17A Advantage Kit
Part#101599

Simoa® IL-4 Advantage Kit
Part#100196

Simoa® IL-1β Advantage Kit
Part#101605

Simoa® Homebrew kit for custom-made ultra-sensitive assays
Part# 101354

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Researchers everywhere have applied the ultra-sensitivity of Simoa® to measure otherwise undetectable levels of IFNα. Below is a sample of key publications in the area of autoimmune and infectious diseases. Importantly, many of the publications have benefited not only from ready to use, validated **Simoa® kits**, but also from **custom-made homebrew kits** developed to quatitate any target, protein or even antibodies, and achieving attomolar to femtomolar levels of sensitivity.

Simoa® technology powers high impact publications on auto-immune and infectious diseases

Impaired type I interferon activity and inflammatory responses in severe COVID-19 patients
DOI: 10.1126/science.abc6027

Auto-antibodies against type I IFNs in patients with life-threatening COVID-19. Science.
DOI: 10.1126/science.abd4585

Differential levels of IFNα subtypes in autoimmunity and viral infection.
DOI: 10.1016/j.cyto.2021.155533

Plasma Exchange to Rescue Patients with Autoantibodies Against Type I Interferons and Life-Threatening COVID-19 Pneumonia.
DOI: 10.1007/s10875-021-00994-9

Early nasal type I IFN immunity against SARS-CoV-2 is compromised in patients with autoantibodies against type I IFNs.
https://doi.org/10.1084/jem.20211211

Onset and Relapse of Juvenile Dermatomyositis Following Asymptomatic SARS-CoV-2 Infection.
doi: 10.1007/s10875-021-01119-y

Distinct systemic and mucosal immune responses during acute SARS-CoV-2 infection.
DOI: 10.1038/s41590-021-01028-7

Plasma interferon-alpha is associated with double-positivity for autoantibodies but is not a predictor of remission in early rheumatoid arthritis-a spin-off study of the NORD-STAR randomized clinical trial.
DOI: 10.1186/s13075-021-02556-1

SIMOA® BEAD TECHNOLOGY SYSTEMS

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HD-X Analyzer™

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