CyTOF and Maxpar Direct Technologies Utilized in Study Characterizing Immune and Inflammatory Responses in Pregnant Women Infected with SARS-CoV-2

August 31, 2021

Findings in Nature Communications Provide Insights That May Help Guide Patient Care

Research Study Conducted in Collaboration with Fluidigm's Therapeutic Insights Services

SOUTH SAN FRANCISCO, Calif., Aug. 31, 2021 (GLOBE NEWSWIRE) -- Fluidigm Corporation (NASDAQ:FLDM), an innovative biotechnology tools provider with a vision to improve life through comprehensive health insight, today announced the publication of new data further validating the potential of its mass cytometry technologies, including CyTOF® systems and the Maxpar® Direct™ Immune Profiling Assay™, to enable deep profiling o immune and inflammatory responses that play critical roles in infection and other significant health conditions.

The recently published study in *Nature Communications* evaluated key inflammatory pathways in pregnant women infected with SARS-CoV-2, the virus that causes COVID-19, compared with uninfected pregnant women and women who were not pregnant. Results from the study indicate that pregnant women have increased levels of some anti-inflammatory proteins with decreased levels of some inflammation markers, while other inflammatory molecules remain unchanged. These data may help to improve care for pregnant women with SARS-CoV-2 infection.

Researchers at the University of Modena and Reggio Emilia in Italy and at Fluidigm conducted the study in collaboration with Fluidigm's Therapeutic Insights Services, which helped with the study design, developed custom antibodies, processed samples and provided detailed data to the research team for analysis.

"These results are the first to characterize the immune profiles and activity of asymptomatic or paucisymptomatic pregnant women infected with SARS-CoV-2 and to compare them with profiles from uninfected pregnant women and controls," said Andrea Cossarizza, MD, PhD, Professor of Pathology, Immunology and Clinical Immunology at the University of Modena and Reggio Emilia, and an author of the publication. "They provide clinicians with important insights for potential consideration in managing care for pregnant women infected with the virus. These insights are especially important to physicians and patients considering early induction of labor in order to protect the fetus from potential harm if the mother is infected."

Hormonal changes result in the immune system taking on more anti-inflammatory characteristics during pregnancy. It is unclear whether these changes increase the risk of pregnant women becoming infected with SARS-CoV-2 due to potentially lower immune system reactivity, or whether the reduced inflammatory activity may help to reduce the risk of cytokine storm associated with severe COVID-19 disease. As part of the study, researchers used the Maxpar Direct Immune Profiling Assay, six additional Fluidigm labeled antibodies and two custom-labeled antibodies to simultaneously evaluate 38 immune markers on blood cells collected from patients. Additional tests were done to evaluate the levels of secreted immune proteins. Key findings of the study include:

- Evaluation of 62 cytokines in 14 infected pregnant women, 28 uninfected pregnant women and 15 age-matched women who were not pregnant (controls) found that pregnant women generally had more anti-inflammatory cytokine profiles compared with controls, and that this was increased in pregnant women who were infected. The authors of the study hypothesize that this anti-inflammatory profile is part of the normal process that protects the fetus from attack by the mother's immune system, and that this may be increased in infected women to counterbalance their increased immune response to the virus.

- Mass cytometry evaluation found that, regardless of infection status, pregnant women had similar types, proportions and activities of different circulating immune cells with the exception of low-density neutrophils (LDNs), which were present at higher levels in infected pregnant women.

- Mass cytometry evaluation also found that the expression of genes that play critical roles in the development and activity of T cell subsets was similar among all three groups of women.

- T cells from infected and uninfected pregnant women were fully functional with respect to proliferation and cytokine production, with the CD4+ subset of T cells demonstrating a small but significant increase in proliferation or cell division in infected women compared with uninfected pregnant women.

- Comprehensive analyses identified highly significant correlations between the levels of LDN and multiple cytokines in

infected women but not in uninfected pregnant women. Several positive correlations among plasma cytokines that were much more extensive in infected compared with uninfected pregnant women were also identified.

The authors hypothesize that the immunosuppression normally present during pregnancy may protect most pregnant women from the cytokine storm, massive immune activation and hyperinflammation associated with severe COVID-19 disease, while also protecting the fetus from the mother's immune response to the virus.

"This publication, which is likely the first detailed immunological study of pregnant women with SARS-CoV-2 infection, is the latest of more than 30 peer-reviewed studies in 2021 alone using Fluidigm mass cytometry, including Imaging Mass Cytometry™ and Maxpar Direct technologies, to study COVID-19 and SARS-CoV-2 infection," said Andrew Quong, Chief Science Officer of Fluidigm and an author on the publication. "Fluidigm is proud that its mass cytometry technologies are enabling rapid advancement of our knowledge in this critical area. With this study, the research team has provided critical insights that can be used to optimize pregnancy and health outcomes for pregnant women infected with SARS-CoV-2 and their babies."

About Fluidigm

Fluidigm (Nasdaq:FLDM) focuses on the most pressing needs in translational and clinical research, including cancer, immunology, and immunotherapy. Using proprietary CyTOF and microfluidics technologies, we develop, manufacture, and market multi-omic solutions to drive meaningful insights in health and disease, identify biomarkers to inform decisions, and accelerate the development of more effective therapies. Our customers are leading academic, government, pharmaceutical, biotechnology, plant and animal research, and clinical laboratories worldwide. Together with them, we strive to increase the quality of life for all. For more information, visit fluidigm.com.

Forward-Looking Statements for Fluidigm
This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, including, among others, statements regarding the potential benefits of research conducted using Fluidigm technology and products. Forward-looking statements are subject to numerous risks and uncertainties that could cause actual results to differ materially from currently anticipated results, including but not limited to risks relating to challenges inherent in developing, manufacturing, launching, marketing, and selling new products; potential product performance and quality issues; intellectual property risks; competition; uncertainties in contractual relationships; and reductions in research and development spending or changes in budget priorities by customers. Information on these and additional risks and uncertainties and other information affecting Fluidigm business and operating results is contained in Fluidigm's Annual Report on Form 10-K for the year ended December 31, 2020, and in its other filings with the Securities and Exchange Commission. These forward-looking statements speak only as of the date hereof. Fluidigm disclaims any obligation to update these forward-looking statements except as may be required by law.

Available Information
We use our website (fluidigm.com), investor site (investors.fluidigm.com), corporate Twitter account (@fluidigm), Facebook page (facebook.com/Fluidigm), and LinkedIn page (linkedin.com/company/fluidigm-corporation) as channels of distribution of information about our products, our planned financial and other announcements, our attendance at upcoming investor and industry conferences, and other matters. Such information may be deemed material information, and we may use these channels to comply with our disclosure obligations under Regulation FD. Therefore, investors should monitor our website and our social media accounts in addition to following our press releases, SEC filings, public conference calls, and webcasts.

Fluidigm

Media:
Mark Spearman
Senior Director, Corporate Communications
650 243 6621
mark.spearman@fluidigm.com

Investors:
Peter DeNardo
415 389 6400
ir@fluidigm.com

Source: Fluidigm Corporation