Automated flow cytometry for medical diagnostics

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Abstract

Medical diagnostic flow cytometry is currently limited to high complexity laboratory settings because preanalytical steps are time consuming, exciting and requires highly trained and capable technologists to interpret variability and acceptance of flow cytometry testing by users and regulatory bodies. Finally, interpretation of flow cytometry results require highly trained flow cytometers who are typically available only during normal work hours.

LeukoDx continues to work to develop user-friendly, point-of-care flow cytometers that can be used in different settings. Key research efforts have been dedicated to the development of a disposable cartridge-based system that enables end users to perform near-patient testing of liquid samples.

Relevance to clinical laboratory practice

What is the first application?

sepsis detection based on NCE C64 up-regulation

How are the antibody cocktails introduced?

Put a drop of blood into the cartridge

How is fluorescence detected and read?

Wet 10 minutes and read the C64 Index

Method continued

What is the fluor signature matrix A?

How is the antibody cocktail introduced?

LeukoDx Reader

What is our Conclusion?

The disposable cartridge-based platform described in this paper limits flow cytometry to non-stat applications and require highly trained and capable technologists to minimize variability. This typically leaves the point-of-care testing (POCT) sector of the laboratory to less complexity certified laboratories.

Results

What are the 8-channel results from a C64 assay?

Scatterplot matrix shows 4-color separation of NE, RD, LD, and Beads

How is the antibody cocktail introduced?

LeukoDx Reader vs. ICS data in healthy and ILI patients

What is our Conclusion?

A C64 assay for Sepsis is the first of the LeukoDx family of cartridge assays being developed. Additional assays will include testing for the detection of malignancy. The disposable cartridge-based platform described in this paper limits flow cytometry to non-stat applications and require highly trained and capable technologists to minimize variability. This typically leaves the point-of-care testing (POCT) sector of the laboratory to less complexity certified laboratories.