



novigenix

LITOSseek™
Digital Cytometry

Precise & Predictive Patient Profiling

LITOSseek™ Digital Cytometry for Easy and Cost-Effective Immune Cell Deconvolution in Cancer Patients

The immune system plays a central role in tumor development and progression, underscoring the need for reliable and cost-effective methods for systemic monitoring of the immune landscape. Consequently, transcriptomic profiling of peripheral immune cells has emerged as a crucial method for cellular analysis to evaluate key indicators in the immune system status and responses, aiding in cancer prognosis and therapy response prediction. For instance, favorable responses to immunotherapy have been associated with variations in immune cell populations, such as a higher proportion of lymphocytes, while a higher neutrophil-to-lymphocyte ratio (NLR) often signals a less favorable outcome.

In the realm of immune monitoring, digital cytometry has emerged as an appealing alternative to traditional

methods like flow cytometry or mass cytometry, which require complex and costly clinical workflows. However, existing digital cytometry techniques are calibrated for peripheral blood mononuclear cells (PBMCs) obtained from healthy individuals, neglecting the dynamic range required to accurately assess immune cell abundances in cancer patients. The Novigenix digital cytometry solution, LITOSseek™ Digital Cytometry, addresses these limitations by employing whole-blood RNA sequencing, eliminating the need for the analysis of fresh samples using flow cytometry or CyTOF, and providing a more accurate representation of cell type abundances.

Advantages of Novigenix Liquid Biopsy Digital Cytometry

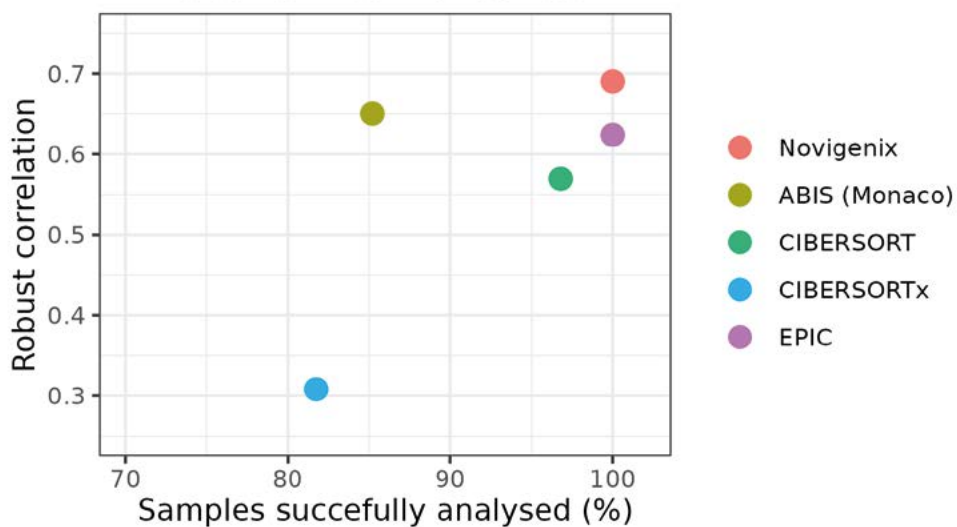
Patient blood immune cell-type composition can be assessed by cytometry or inferred from bulk RNA-seq data with deconvolution methods, commonly known as digital cytometry. Clinical assessment of cellular abundance through flow cytometry and CyTOF requires live cells, posing logistical challenges in clinical trials resulting in inconsistent data at high cost. Digital Cytometry offers several advantages over traditional cytometry, particularly when blood is collected in PAXgene® Blood RNA Tube. These tubes stabilize the RNA at the blood collection site, facilitating robust, clinically advantageous, and flexible analyses. Additionally, Digital Cytometry enables retrospective analysis of frozen patient samples, whereas traditional cytometry is restricted to prospective collection of fresh blood samples to avoid losing fragile cells such as neutrophils.

LITOSseek™ Digital Cytometry

The LITOSseek™ Digital Cytometry analytical pipelines have been specifically tailored using blood samples from cancer patients, ensuring optimized gene signatures that capture the dynamic range of cellular abundances in whole blood. The platform currently supports the analysis of five key peripheral immune cell types, namely T cells, B cells, NK cells, Monocytes, and Neutrophils, with ongoing development for additional immune cell type signatures.

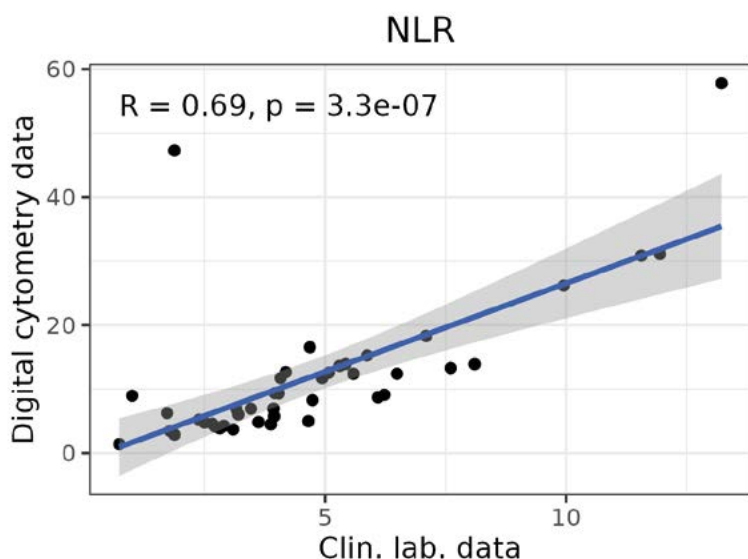
The LITOSseek™ Digital Cytometry score reliably tracks cell type abundance in cancer patients, showcasing superior performances compared to other widely used digital cytometry methods:

Gastrointestinal cancer

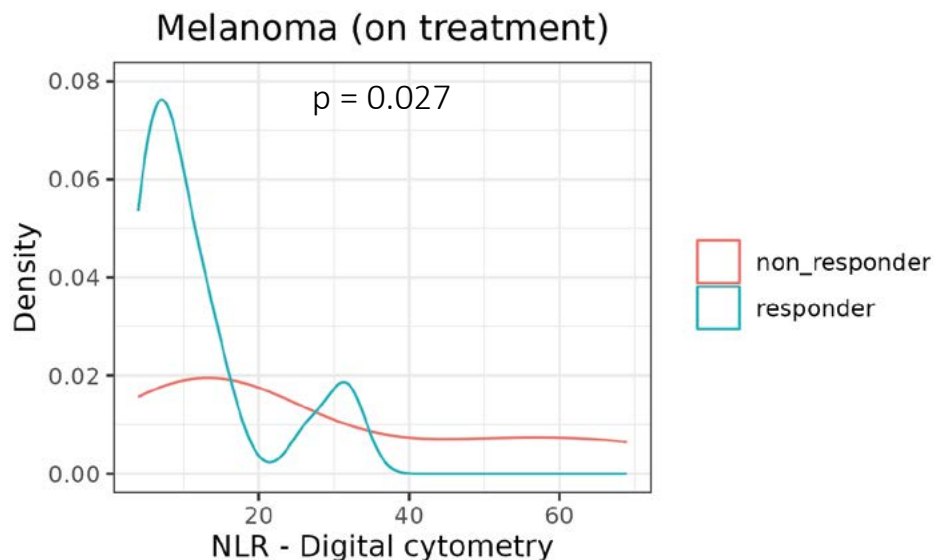


LITOSseek™ Digital Cytometry Assessment of Neutrophil-to-Lymphocyte Ratio (NLR)

Studies of NLR in melanoma patients undergoing immunotherapy have shown that a high NLR is associated with a low response rate. Obtaining these data in large clinical trials and multicentric collaborative studies are logistically complex and costly due to requirements of analyzing fresh blood samples. To overcome these challenges, we have developed optimized analytical pipelines that enable the accurate quantification of NLR in stabilized whole blood PAXgene® Blood RNA Tube. When benchmarked against standard Clinical Laboratory data, LITOSseek™ Digital Cytometry demonstrates a very high correlation, reflecting the robustness of this method:



The application of LITOSseek™ Digital Cytometry in melanoma patients undergoing immunotherapy underscores the precision of this approach for evaluating NLR in clinical trial setting. The data reveals that patients who positively responded to immunotherapy (responders) exhibited considerably lower NLR compared to non-responders.



These data are consistent with findings from studies using fresh patient samples and traditional cytometry methods (Yayun et al., J Immunotherapy, 2022; Cohen et al, Melanoma Management).

Conclusion

Novigenix's LITOSseek™ Digital Cytometry is a cutting edge solution for analyzing whole blood samples from cancer patients. By leveraging PAXgene® Blood RNA Tube stabilized blood samples and bulk RNA-sequencing, LITOSseek™ Digital Cytometry effectively reduces logistical demands and costs associated with traditional cytometry workflows in clinical trial settings. Its ability to precisely track cell type abundance, alongside relevant cell ratios across various samples and over time, highlights its extensive clinical utility.

LITOSseek™ Digital Cytometry maintains consistent performance in both healthy donor and cancer patient blood samples, surpassing other digital cytometry methods in accuracy and dynamic range. The range of cell types analyzed by LITOSseek™ Digital Cytometry is continuously expanding, providing customizable solutions to meet specific customer needs in the development of novel therapeutics.





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