

## The Hyperion and Hyperion+ Imaging Systems

### Uncover important spatial relationships with high-plex imaging of 40-plus markers simultaneously at subcellular resolution

The Hyperion™ Imaging System is the established leader in high-plex imaging, based on widespread use and publications. Using Imaging Mass Cytometry™ (IMC™) for comprehensive analysis of cellular phenotypes within the complex spatial biology of the tissue microenvironment, it has become the standard for:

- Better understanding disease and response to treatment
- Stratifying subjects by linking high-plex data to outcomes in clinical studies
- Uncovering novel therapeutic targets

The Hyperion Imaging System helps reveal a more complete picture that will further contribute to the successful development of novel immunotherapies and our understanding of health and disease.

### Introducing the advantage of speed with the new Hyperion+ Imaging System

The next milestone in high-plex tissue imaging is here. Because of recent technological improvements, you now have two choices for this gold-standard imaging solution.

The Hyperion+™ Imaging System has all the advantages of the Hyperion Imaging System with twice the speed. That helps you reach insights faster, enhancing decision making and leading to a significant impact for many translational and clinical research projects. The Hyperion+ Imaging System can process 100-plus samples per week\* and has at least a 1.6x lower limit of detection, making it better able to detect dim markers, which can be critical for some lower-expressing markers often used in translational studies.



### Highlights

**Advance**—Achieve a high return on your investment with cost savings and a simplified, scalable workflow.

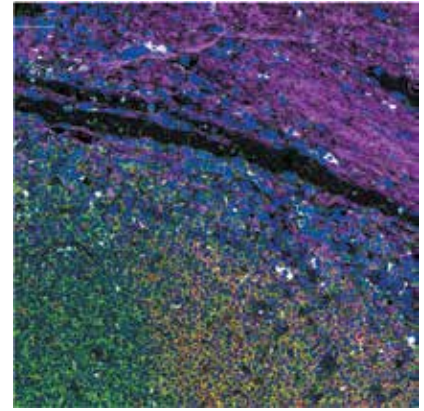
**Enable**—Optimize immunotherapy evaluation with the most proven approach, leading to accurate phenotyping of the tissue microenvironment.

**Accelerate**—Enable fast, confident decision-making through rapid attainment of quantitative, quality single-cell data.

## The gold standard of tissue imaging at 2x speed

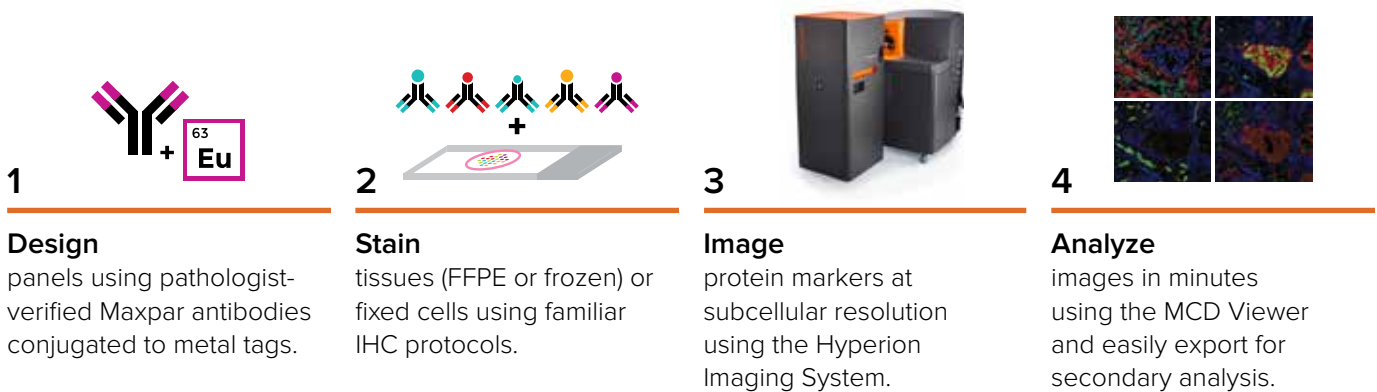
Though IMC is similar to immunohistochemistry (IHC), it can be 10x less costly when imaging high numbers of markers. For tissue imaging projects that look at 8 or more markers and require faster slide-to-data results, the Hyperion+ Imaging System is the ideal solution for today and well into the future.

**Figure 1. A 400 Hz image of a human tonsil highlights the detail provided by the Hyperion+ Imaging System, which runs at twice the speed of the Hyperion Imaging System.** FFPE human tonsil tissue was stained with multiple antibodies targeting different cell types and structures. Pseudocolors show collagen (magenta), CD45 (green) marking the immune cells, CD3 (red) targeting T cells, CD68 (white) for macrophages and DNA in blue. Image size is at 0.5 x 0.5 mm.



## Why IMC is the top enabling technology for quantitative high-plex tissue imaging

Bringing together high-parameter CyTOF® technology with imaging capability enables visualization of protein markers in the spatial context of the tissue microenvironment, far surpassing the capabilities of fluorescence IHC. The straightforward IMC workflow uses simple stain-image-analyze steps (Figure 2) from formalin-fixed, paraffin-embedded or frozen tissue sections. This is in contrast to time-consuming cyclic immunofluorescence approaches that limit you to complicated digital profiling approaches or a low number of slides each week.



**Figure 2. The Imaging Mass Cytometry workflow.** A simple 4-step workflow for high-plex tissue imaging.

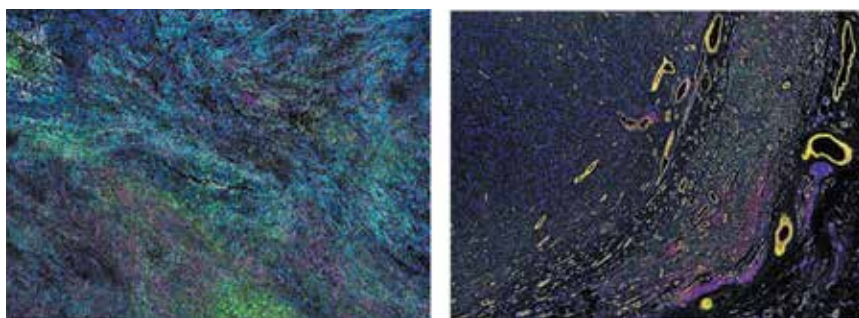
Because there's no autofluorescence, you get reliable results when working with highly autofluorescent tissues like lung, gut, brain and skin. You get the most accurate and quantifiable phenotyping and cell function assessment. Whether you are looking to monitor disease progression, assess biomarker signatures or evaluate a therapeutic response or drug activity, IMC leads you to consistent results you can depend upon.

## Using IMC to accelerate success in cancer research and immunotherapy development

To obtain biological insights into cancer, there are many elements of the tumor microenvironment to consider: stroma, vascularization, nutrients in blood flow, fibrotic regions and various immune cell phenotypes and interactions. High-plex tissue imaging with IMC helps reveal a more complete picture that further contributes to successful development of novel immunotherapies and adoption in the clinic. Images of undifferentiated pleomorphic sarcomas (Figure 3), a rare soft-tissue cancer that usually occurs in the arms and legs in patients over the age of 50, show the type of information IMC can help uncover.

IMC does more than help you understand the cell repertoire. It reveals cell function, especially in the context of spatial localization and cell-to-cell communication. Numerous published studies as well as ongoing clinical trials demonstrate IMC use in cancer and immuno-oncology research. IMC is a key tool for a multi-omic approach to understanding the complex interactions essential to developing new therapies and why existing therapies are successful or not. The growing trend for the use of IMC in cancer immunotherapy studies is clear.

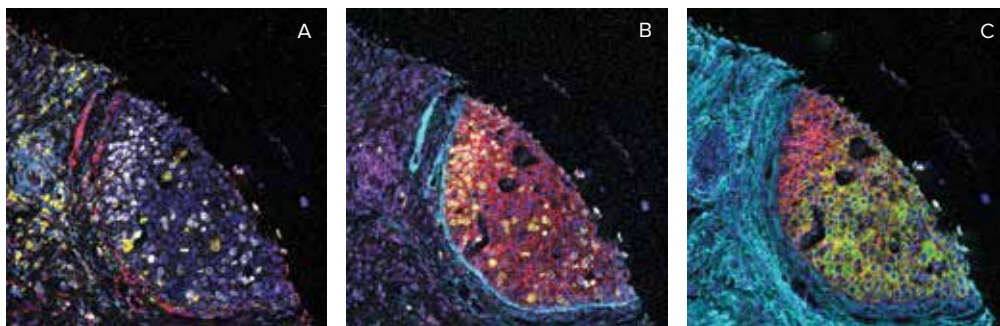
### Sarcoma imaged at 400 Hz provides single-cell details



**Figure 3. Two undifferentiated pleomorphic sarcoma (UPS) tissue samples help visualize the organization of blood vessels.** Tissues expressing CD31 (orange) and aSMA (yellow) and immune cells such as CD8<sup>+</sup> cytotoxic T cells (red), CD68<sup>+</sup> macrophages (green), and myeloperoxidase enzyme (MPO) (white)-expressing neutrophils, which are surrounding and infiltrating the tumor mass, are visualized at 400 Hz. Image size is 6,943  $\mu\text{m}$  x 3,805  $\mu\text{m}$ .  
Credit: Jackson Lab, Lunenfeld-Tanenbaum Research Institute, and Mount Sinai Hospital.

### Options to help simplify panel design for high-plex tissue imaging

A collection of IMC panel kits and a growing portfolio of metal-tagged Maxpar<sup>®</sup> or Maxpar OnDemand<sup>™</sup> catalog antibodies empowers researchers to build and employ the ideal high-plex proteomics panel, ensuring that you get the most out of your tissue imaging with IMC.



**Figure 4. A range of markers from simultaneous staining of human breast cancer tissue with the 18 markers in the Maxpar Human Immuno-Oncology IMC Panel Kit.** A) Human breast cancer tissue showing vimentin (red), CD45 (cyan), CD68 (yellow), Ki-67 (white), DNA2 (blue). B) Human breast cancer tissue showing aSMA (cyan), CD45 (magenta), E-cadherin (red), Ki-67 (yellow), DNA2 (blue). C) Human breast cancer tissue showing pan-keratin (lime), E-cadherin (red), collagen 1 (cyan), DNA2 (blue).

## Visualize spatial context of multiplex data in minutes

The MCD™ Viewer software that accompanies the Hyperion Imaging System precisely digitizes the scanned cells and tissues into TIFF images of publication quality. Each image can be spectrally separated to display the expression of each protein, yet the files remain small and easy to handle. Data for each region of interest can be exported for third-party analysis on software such as histoCAT™, the Visiopharm® phenotyping module or Indica Labs HALO®. The Visiopharm software now enables native reading of IMC data files, with all metadata and imagery intact, and simplifies the workflow, enabling faster analysis of cellular phenotypes and their interrelationships.

## Maximize system performance with Fluidigm service, support and training

With the Fluidigm service plan, you can boost productivity, control costs and minimize downtime. Service plan options are attractively priced and include regularly scheduled maintenance visits to ensure that your Hyperion or Hyperion+ Imaging System is kept in peak operating condition. Fluidigm Field Application Specialists provide you with a selection of training programs to help you get started.

Get a view into the spatial context essential to understanding complex phenotypes and tumor-immune interactions.

Learn more at [fluidigm.com/hyperion-plus](https://fluidigm.com/hyperion-plus)

\*Calculation of two 1.0 x 1.0 mm ROIs per slide run on instrument run 24/7 for 1 week

### For Research Use Only. Not for use in diagnostic procedures.

Information in this publication is subject to change without notice. **Limited Use Label License:** The purchase of this Fluidigm Instrument and/or Consumable conveys to the purchaser the limited, nontransferable right to use only with Fluidigm Consumables and/or Instruments respectively except as approved in writing by Fluidigm: [www.fluidigm.com/legal/salesterms](https://www.fluidigm.com/legal/salesterms). **Patents:** [www.fluidigm.com/legal/notices](https://www.fluidigm.com/legal/notices). **Trademarks:** Fluidigm, the Fluidigm logo, CyTOF, Hyperion, Hyperion+, Imaging Mass Cytometry, IMC, Maxpar, MCD and OnDemand are trademarks and/or registered trademarks of Fluidigm Corporation or its affiliates in the United States and/or other countries. All other trademarks are the sole property of their respective owners. ©2022 Fluidigm Corporation. All rights reserved. 04/2022

FLDM-00948 Rev 01