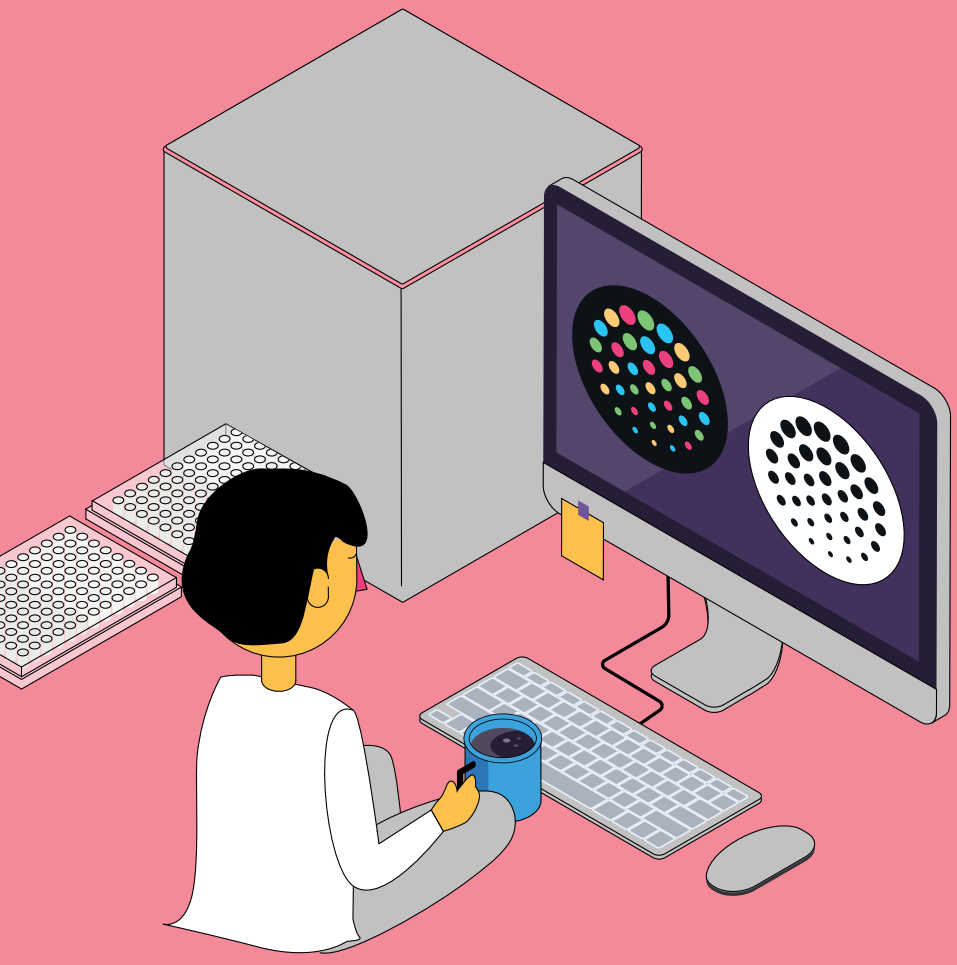
IRIS & ASTOR

Precision readers for ELISpot and FluoroSpot



MABTECH

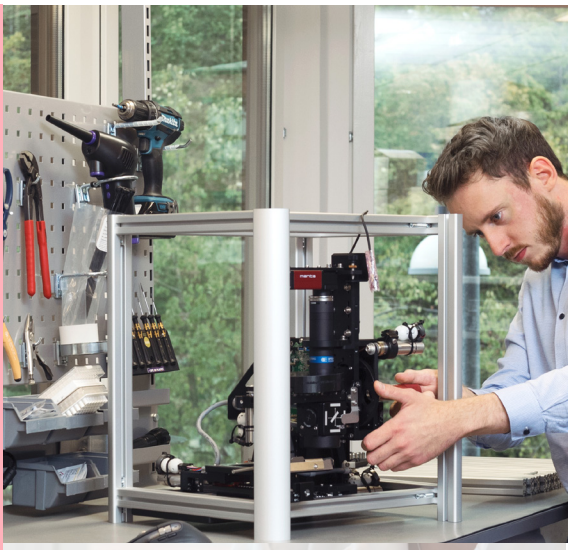
Your trusted source for immunoassays

At Mabtech, we make immune monitoring a little easier by providing reliable tools for ELISpot, FluoroSpot, ELISA, and multiplex assays. Our mission is to refine and simplify these technologies so you can focus on what matters most: your research.

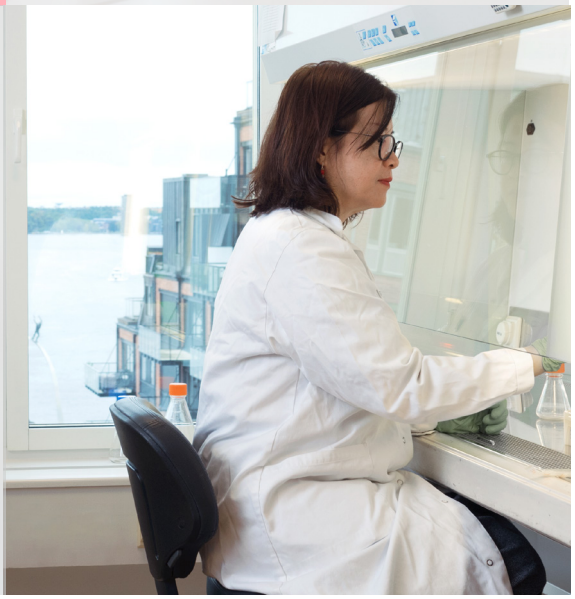
It all began in the 80s with custom monoclonal antibodies. Since then, our portfolio has grown to include a wide range of antibodies, kits, and peptide pools, as well as instruments for analyzing ELISpot, FluoroSpot, and multiplex assays.

We're a Swedish company with headquarters in Nacka Strand, just east of central Stockholm, where everything from research and production to marketing, distribution, and sales happens under one roof. We also have a sales office in the USA and work with excellent distributors around the world.

Our readers were developed out of necessity when we realized existing systems were difficult to use and often unreliable. Frequent calibrations, parameter tweaking, and inconsistent spot counts slowed down research and added variability. By creating our own instruments, we eliminated these frustrations. The result is a new generation of readers that are fast, intuitive, and precise, built to deliver consistent results without the fuss.



"From our antibodies to our instruments, every product is meticulously designed to ensure you can focus on what really matters: your research."

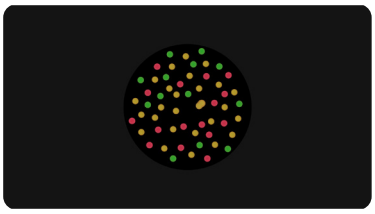


Accurate spot analysis made simple

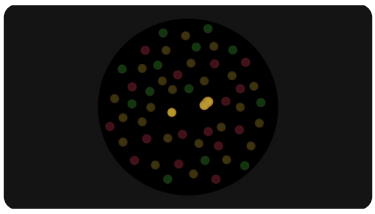
To make plate reading and spot analysis effortless, we developed **Mabtech IRIS**™ and **Mabtech ASTOR**™. IRIS supports FluoroSpot, ELISpot, and FociSpot, while Mabtech ASTOR is purpose-built for ELISpot & FociSpot.

Our readers set a new standard for spot analysis. Just select your assay, load the plate, and press read. The patented **RAWspot**™ algorithm finds the true spot center and delivers precise counts every time. Combined with our intuitive **Mabtech Apex**™ software, the workflow is fast, consistent, and a breeze to use.

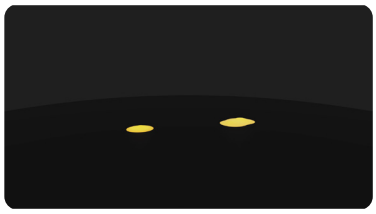
Precise spot center detection for accurate analysis



In FluoroSpot, it's crucial to distinguish single from dual analyte spots.

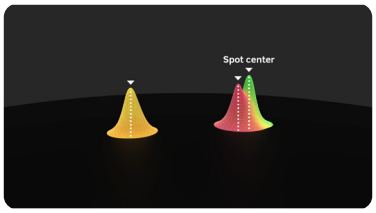


Competitor readers use image analysis where single analyte spots can be mistaken for dual.

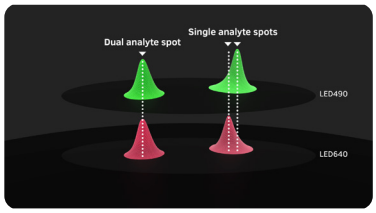


A standard 8-bit image is relatively flat.

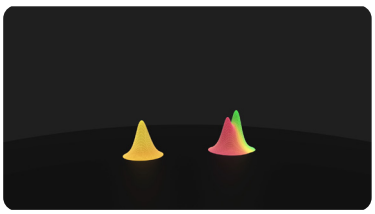
RAWspot uses the **wide dynamic range** of the image's RAW signal.



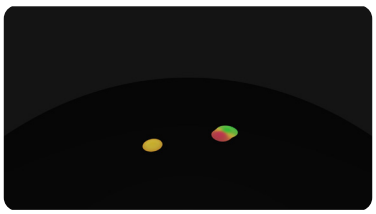
RAWspot finds **the spot center**.



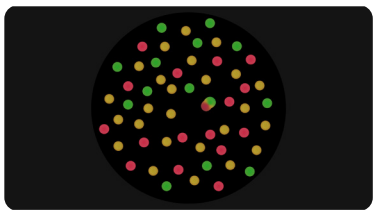
Overlapping spot centers indicate a dual analyte spot.



Every spot has a volume corresponding to the amount of secreted analyte.



Accurate spot centers ensure that **multiplexing is reliable**.



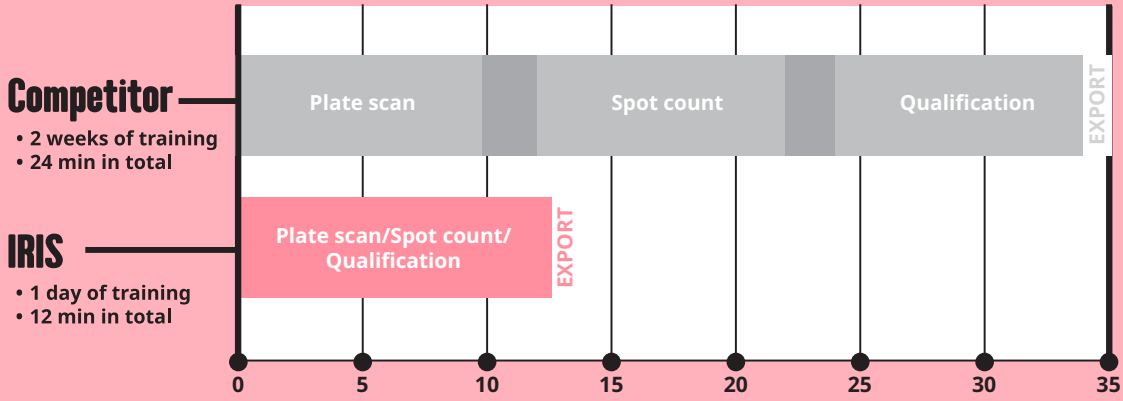
RAWspot technology: Scientific signal processing

The development of the patented RAWspot™ technology has resulted in several scientific publications in peer-reviewed journals.

Designed for speed, accuracy, and ease

Get results in a third of the time

Mabtech IRIS delivers full plate scans, spot counts, and qualification in just 12 minutes for a 2-color FluoroSpot plate, compared to over 30 minutes with conventional readers. On top of this, competing systems require weeks of training just to get acquainted with the reader and its software. Intuitive workflows, pre-set configurations, and unprecedented export capabilities (Excel and GraphPad Prism) let you focus on analyzing results instead of figuring out the instrument.

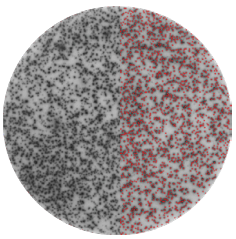


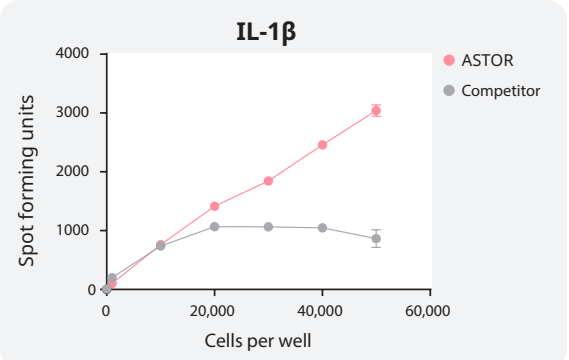
Have confidence in your results

Regardless of operator or operator experience. Automated reader configurations and default analysis settings minimize subjective input and interpretations, reducing operator bias.

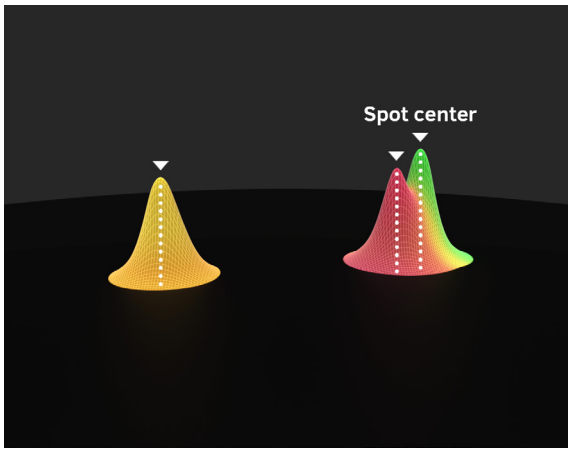
Detect every spot

Our readers identify distinct spots in a linear fashion without hitting a plateau. Based on signal processing, the algorithm provides objective results for immediate analysis. Every spot, no matter how small, big, faint, or distinct, is detected.





Spot analysis that goes deeper



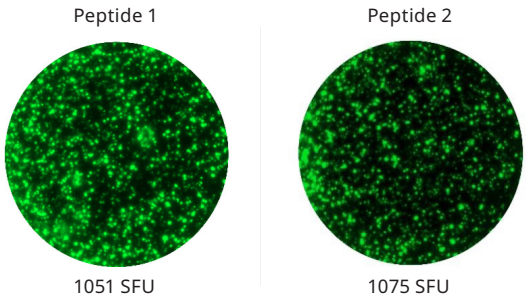
Secretory profile of every cell

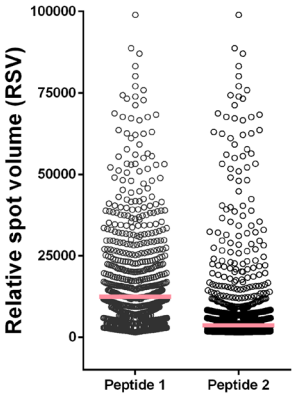
Our RAWspot technology depicts the secretory profile of every cell to determine the exact spot center. This ensures reliable spot counts as well as accurate identification of multi-analyte secreting cells in FluoroSpot.

RAWspot technology's 3D model allows for a new type of data be generated in FluoroSpot and ELISpot: **relative spot volume**. Now you can measure the relative amount of secreted analyte per cell.

Adding new depth with relative spot volume (RSV)

With the introduction of RSV, spot analysis moves beyond simple counts. In the following experiment, PBMCs from the same donor were stimulated with two different peptide pools. While traditional spot forming units (SFU) readouts show little difference (1051 vs. 1075), the well images tell another story: peptide 1 produces larger, brighter spots. RSV analysis confirms our visual observation: peptide 1 has a higher average RSV, indicating greater analyte secretion per cell.





Read once, adjust later

After reading the plate, you are free to change count settings, the experimental layout, and the look of well images, all without affecting the original data. The entire signal from each spot is already recorded, so adjustments can be done post-reading and you'll never have to re-read a plate.

A new era of almost-too-easy

Ready for automation

Both readers are designed to make the analysis of larger projects as painless as possible. In addition to self-calibration, responsive software, and easy data handling, IRIS and ASTOR allow for robotic plate loading. Our readers can be part of an automated workflow with a robotic arm or be fully integrated into a larger automated setup. Each automation solution is unique, but we'll be here for you every step of the way.

End-to-end FluoroSpot automation at NIH

Researchers at the Vaccine Research Center, NIH, built one of the first fully automated, end-to-end FluoroSpot workflows, as published by Jethmalani Y. et al. 2025. In their workflow, Mabtech IRIS served as the final analytical step, integrating with robotic liquid handling and plate transport to enable hands-free processing of up to 25 plates per run.

With fixed-focus optics, self-calibrating mechanics, and robotic plate loading, IRIS delivers highly reproducible, single-cell FluoroSpot data across large multi-plate runs. In the study, intra-plate and inter-plate precision below 10% and intra-assay variation below 15% were achieved, even at scale.

That's almost ELISA levels of precision!

Benefits at a glance

Exact spot center
Accurate spot count and multiplexing

Always supported
Help and service, whenever you need

New data dimension
Compare the amount of secreted analyte

Scientific output
Export to Excel or GraphPad Prism

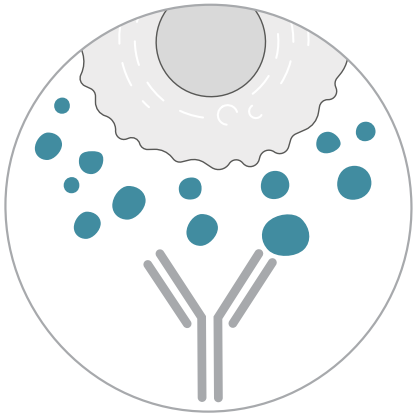
Plug-and-play
Insert plate, press read, and export

21 CFR part 11
Apex is ready-to-go

Insights through spot analysis

Sensitive detection with ELISpot and FluoroSpot

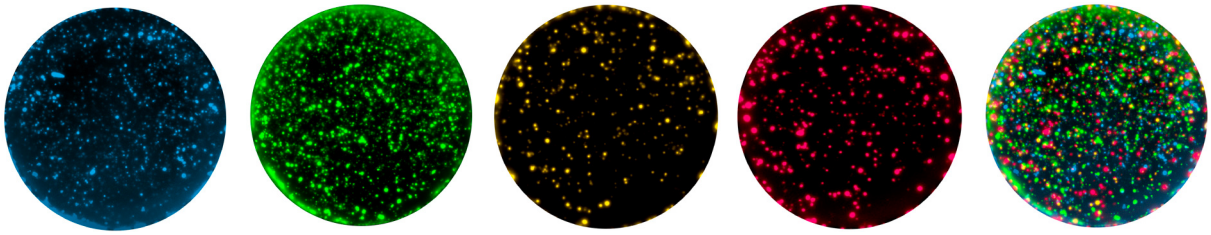
In ELISpot and FluoroSpot, the analytes of interest are captured directly upon secretion and throughout the stimulation process. This enables the analysis of physiologically relevant secretion. It's also why these assays are considered extremely sensitive cellular assays, making them particularly useful for studying rare cell populations that arise during specific immune responses.



Analysis of physiologically relevant secretion

Study up to four analytes simultaneously with FluoroSpot

FluoroSpot allows for simultaneous detection of cells secreting multiple analytes such as cytokines or immunoglobulins by separate fluorescent signals. This makes the assay ideal for identifying functional subpopulations of cells.



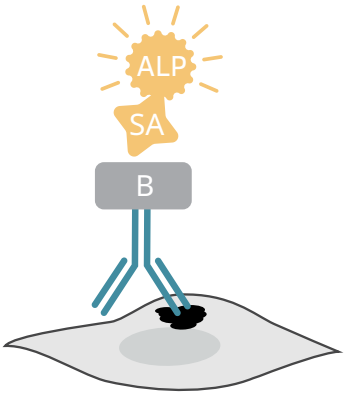
IL-5 IFN-γ IL-22 IL-17A Overlay

FluoroSpot Plus: Human IL-22/IFN-γ/IL-5/IL-17A

Count foci with FociSpot

FociSpot is a new assay platform introduced on our readers, allowing **for automated counting of foci**. In FociSpot, foci are detected with immunostaining using virus-specific mAbs and a precipitating substrate reaction similar to ELISpot, or using fluorophores compatible with the fluorescent channels in IRIS.

Focus forming assays (FFAs) can have a variety of different setups such as focus-forming neutralization tests (FRNT) or Tissue Culture Infectious Dose (TCID50) assays. FRNT and TCID50 can be used to quantify viral titers or virus-specific antibody neutralization titers and are commonly used in vaccine and infection research. FFA, FRNT and TCID50 can all be analyzed with the FociSpot platform.



FociSpot enables analysis of virus-infected cells

Built for regulated science

Regulatory compliance

The EU and the US (FDA) have established guidelines for computerized systems in regulated environments, known as EU Annex 11 and 21 CFR part 11. These guidelines specify that electronic source data must meet the same quality and integrity standards as traditional paper records.

Mabtech Apex™ software is designed to support compliance with these requirements through enhanced data integrity, traceability, and access control features aligned with ALCOA+ principles*.

Some examples:

- Electronic signatures for all actions affecting data output, with mandatory motivations recorded in the audit trail
- Detailed, session-based audit logs for full traceability and review
- Autosave and enforced “Save As” functionality to ensure complete and enduring data records
- Role-based permissions for saving, exporting, and signing data

Together, these features reduce reliance on external process controls and support the use of Apex in GLP-aligned workflows, including drug discovery and development.

*ALCOA+ principles are the best way to generalize how to meet compliance. Data should be: 1) Attributable 2) Legible 3) Contemporaneous 4) Original 5) Accurate 6) Complete 7) Consistent 8) Enduring 9) Available

Don’t just take our word from it, hear it from our customers

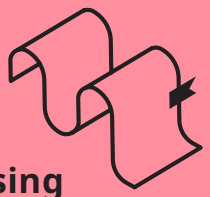
> Mabtech is extremely approachable, and give great assistance with troubleshooting when I’m encountering issues
>
> Lara Kelchtermans, Virology, Antiviral Drug & Vaccine Research Group KU, Leuven, Belgium

> A huge thank you to you and your team for the personalized care and effort to help get our group up and functional.
>
> World-leading Contract Research Organization specializing in immunology

> I like Mabtech IRIS’s simplicity and that it’s fast and very user friendly.
>
> Clara Domingo Villa, King’s College London,UK

> The IRIS feels like a clear upgrade compared to previous readers I have used. Not only is it quicker to learn and use, but it also produces very precise spot-counts that are easy to trust.
>
> Mattias Bronge, Department of Clinical Neuroscience, Karolinska Institutet, Sweden

200+



publications using our readers

SP CERTIFIED ISO 9001 Quality management systems RI. SE

SP CERTIFIED ISO 13485 Medical devices Quality management systems RI. SE

Reader specifications

Mabtech IRIS and Mabtech ASTOR are based on the same intuitive software and plug-and-play hardware. Each reader is built, calibrated, and validated at Mabtech's headquarters in Sweden.

		Recommended
	ASTOR *Anyone can play*	**IRIS** *Spot analysis reinvented*
Applications		
ELISpot	√	√
FluoroSpot	–	Up to 4-color
Enzymatic FociSpot	√	√
Fluorescent FociSpot	√	√
Hardware		
Self-calibrating XY-table	√	√
Light source: LED(s)	White LED ring light	LED380, LED490, LED550, LED640 White LED ring light
CMOS sensor with global shutter	Macro	Telecentric
Plate types: 96-well	ELISpot: MSIP, MAIPSWU	ELISpot: MSIP, MAIPSWU FluoroSpot: IPFL FociSpot: Corning, Nunc
Dimensions (H x W x D)	315 x 430 x 480 mm	505 x 430 x 480 mm
Desktop PC (included)	√	√
Robotic automation ready	√	√
Software		
Mabtech Apex™	√	√
RAWspot™ technology	√	√
Export formats: .raw .jpg .xlsx .pzfx .tiff	√	√
Reading speed ELISpot	<2 min per plate	<2 min per plate
Reading speed FluoroSpot	N/A	5-15 min per plate
Reading speed FociSpot	N/A	<2 min per plate
Service		
Warranty: 1 year, option to prolong	√	√
Qualification: IQ, OQ, PQ	√	√
Regulations		
Compliance with CE, RoHS, REACH, WEEE, FCC, ICES, CFR21 part 11, EU Annex 11	√	√

Check out our readers

For more information on our readers and other products, visit our website! Reader-related documents, publications, and highlighted research summaries are continuously updated. Get the full picture by visiting www.mabtech.com or scanning the QR-code.

Selected references

Our readers appear in numerous publications ranging from vaccine development to cancer research and autoimmunity. Scan the QR code for a full list of references.

Bronge et al., *Identification of four novel T cell autoantigens and personal autoreactive profiles in multiple sclerosis*, Science Advances 2022

Sandberg et al., *SARS-CoV-2-specific humoral and cellular immunity persists through 9 months irrespective of COVID-19 severity at hospitalization*, Clin Transl Immunology 2021

Achiron et al., *Humoral immune response in multiple sclerosis patients following PfizerBNT162b2 COVID19 vaccination: Up to 6 months cross-sectional study,* J Neroimmunol. 2021

Jethmalani Y. et al., *HI-CeFSpot: High-throughput Immune Cell FluoroSpot assay,* Method 2025

Jahnmatz et al., *Memory B-Cell responses against merozoite Antigens after acute plasmodium falciparum malaria, assessed over one year using a novel multiplexed FluoroSpot assay,* Front Immunol. 2020

Zhang et al., *Intraperitoneal oncolytic virotherapy for patients with malignant ascites: Characterization of clinical efficacy and antitumor immune response,* Mol Ther Oncolytics, 2022

Folkesson, E. et al., *A multiplex MTB-specific fluorospot assay measuring IFNΓ, IL-2, and TNF-secreting cells can improve accuracy and differentiation across the tuberculosis spectrum,* Journal of Clinical Microbiology 2025

MABTECH

About Mabtech

Mabtech is a Swedish biotech company founded in 1986. Our mission is to aid scientists to reach new frontiers through optimal immunoassays and instruments.

www.mabtech.com

Nacka 03/2026