



MILLIPLEX[®] Human Interferon Panel

Catalog Number: HIFN-130K, HIFN-130K-PMX9

Introduction

Interferons (IFNs) are widely expressed cytokines that have potent antiviral and antiproliferative effects. These cytokines are the first line of defense against viral infections and have important roles in immunosurveillance for malignant cells. IFNs are classified as type I, II, and III IFNs, based on the target receptors to which they bind. In humans, type I IFNs belong to a multigene family consisting of multiple IFN α subtypes but only one IFN β , IFN ϵ , IFN κ , and IFN ω . There is only one type II IFN: IFN γ . Type III IFNs include IL-29/IFN λ 1, IL-28A/IFN λ 2, and IL-28B/IFN λ 3.

The MILLIPLEX[®] Human Interferon Magnetic Bead Panel is a 9-plex kit to be used for the simultaneous quantification of any or all of the following analytes in serum or plasma samples and tissue/cell lysate and culture supernatant samples: IFN α -2, IFN β , IFN ϵ , IFN γ , IFN γ Receptor 1 (IFNGR1), IFN λ 1, IFN λ 2, IFN λ 3, IFN ω .

Product Highlights

- New analytes: IFN ϵ , IFNGR1
- Verified for study in serum, plasma, and cell/tissue culture samples.
- Recommended sample dilution is 1:2
- Custom premixing is available for 1-9-plex
- Includes Hydration Buffer (Cat. No. L-HB) for hydration of standard, QCs, and serum matrix
- Meets stringent criteria to ensure sensitivity, reproducibility, and specificity
- Broad and fixed standard curve range for lot-to-lot consistency and to make data analysis easier.

Component Information

- Hydration Buffer (Cat. No. L-HB) is a new component to be used for the hydration of standard, QCs, and serum matrix
- Serum matrix to mimic native analyte environment in serum or plasma samples.
- Ready-to-use detection antibodies to yield consistent analyte profiles.
- Two QCs and range sheet are provided to qualify assay performance.
- Future lots of standard compared to a reference lot for lot-to-lot consistency.
- Ready-to-use reagents sufficient to run 38 samples in duplicate in a 96-well plate.



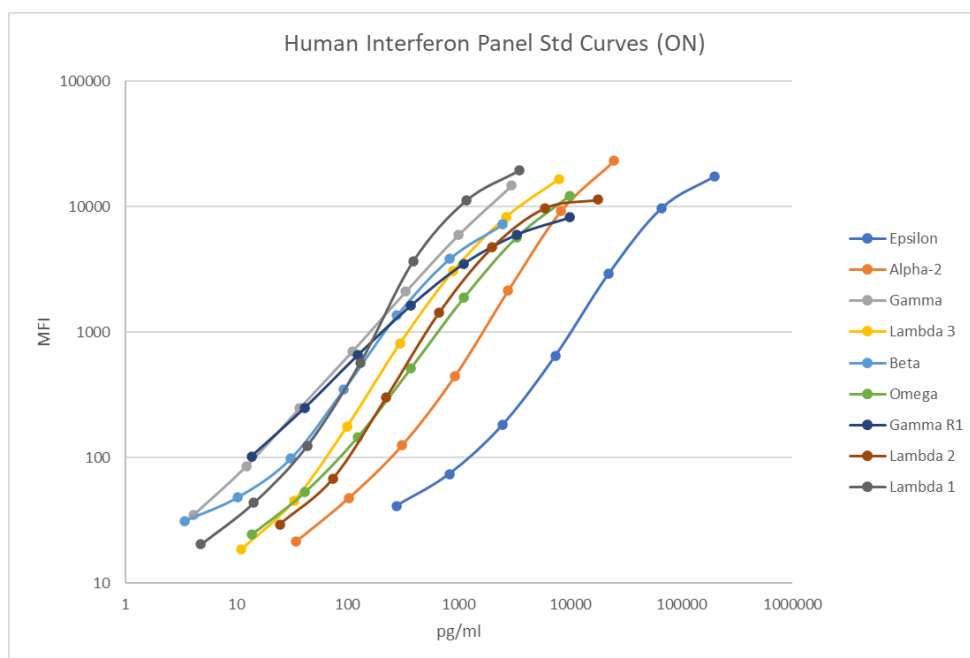
Assay Applications

- This assay may be run overnight (16-18 hours) at 2-8°C or for 2 hours at room temperature (20-25°C) with agitation on a plate shaker.
- A maximum of 25 μL per well of 1:2 diluted serum or plasma should be used.
- Tissue culture supernatants may require dilution in an appropriate control medium. Tissue/cell extracts should be prepared in neutral buffers containing reagents and conditions that do not interfere with assay performance.

Instrument Requirements

Researchers will need access to a Luminex[®] 200[™], MAGPIX[®], xMAP[®] INTELLIFLEX, or FLEXMAP 3D[®] instrument.

Representative Data: Typical Standard Curves (Overnight Assay)



Standard Curves for all analytes performed serum matrix provided in the kit.

Specificity

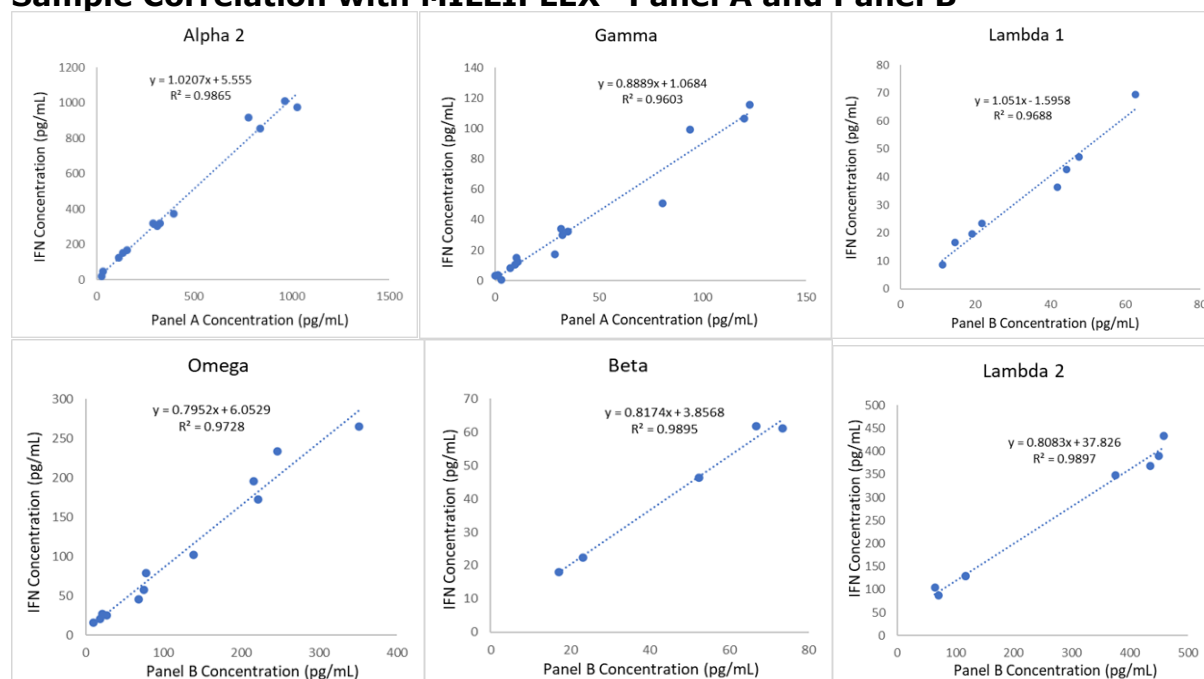
There was no or negligible cross-reactivity between the antibodies for an analyte and any of the other analytes in this panel.



Standard Curve Ranges, Sensitivity, Precision, and Accuracy - Overnight Protocol

Analyte	Standard Curve Range (pg/mL)	Sensitivity MinDC+ 2SD (pg/mL) 8 assays	Precision		Accuracy in Serum Matrix (%) 6 samples
			Intra-Assay (%CV) 16 wells	Inter-Assay (%CV) 10 assays	
IFN ϵ	274-200,000	259.3	<10	<20	94
IFN α 2	34-25,000	42.9	<10	<20	89
IFN γ	4.1-3,000	1.71	<10	<20	96
IFN λ 3	11-8,000	4.9	<10	<20	98
IFN β	3.4-2,500	3.3	<10	<20	96
IFN ω	14-10,000	8.0	<10	<20	96
IFNGR1	14-10,000	5.9	<10	<20	97
IFN λ 2	25-18,000	14.0	<10	<20	94
IFN λ 1	4.8-3,500	4.6	<10	<20	96

Sample Correlation with MILLIPLEX® Panel A and Panel B





Sample Detectability in HIFN-130K vs. other cytokine panels

Disease Samples Overnight										
	Epsilon	Alpha-2	Gamma	IFN λ 3/IL-29	Beta	Omega	Gamma R1	IFN λ 2/IL-28A	IFN λ 3/IL-28B	Disease Types tested
HIFN-130K (n=16)	65%	90%	80%	90%	45%	55%	100%	55%	40%	RA, psoriasis
HCYTA-60K (n=16)		75%	94%							sepsis
HCYTB-60K (n=36)					94%	97%		100%	89%	RA, sepsis
HCYP2MAG-62K (n=16)								19%		sepsis
HCYP3MAG-63K (n=14)				14%						sepsis
HCYP4MAG-64K (n=12)					22%				17%	lupus, sepsis
HCD8MAG-15K (n=29)			38%							sepsis
R&D Systems Discovery/Performance (n=16)			81%		0%		100%	0%		RA, sepsis
Healthy Samples Overnight										
	Epsilon	Alpha-2	Gamma	IFN λ 3/IL-29	Beta	Omega	Gamma R1	IFN λ 2/IL-28A	IFN λ 3/IL-28B	
HIFN-130K (n=16)	63%	88%	81%	81%	50%	69%	100%	69%	50%	
HCYTA-60K (n=20)		65%	75%							
HCYTB-60K (n=20)					90%	95%		100%	85%	
HCYP2MAG-62K (n=16)								19%		
HCYP3MAG-63K (n=20)				15%						
HCYP4MAG-64K (n=20)					20%				0%	
HCD8MAG-15K (n=9)			0%							
R&D Systems Discovery/Performance (n=16)			63%		0%		100%	0%		

Interferon research areas

Type I

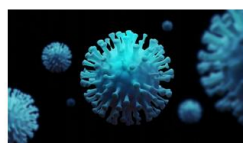
SLE, Sjögren's syndrome, myositis, systemic sclerosis, RA



Viral & bacterial infection - HIV, TB

Other areas - oncology, CVD

Type II



Infectious disease - COVID

IFN γ signature proinflammatory cytokine with a central role in inflammation and autoimmune disease



Type III

SLE, arthritis



Allergic airway disease



Gastrointestinal inflammation



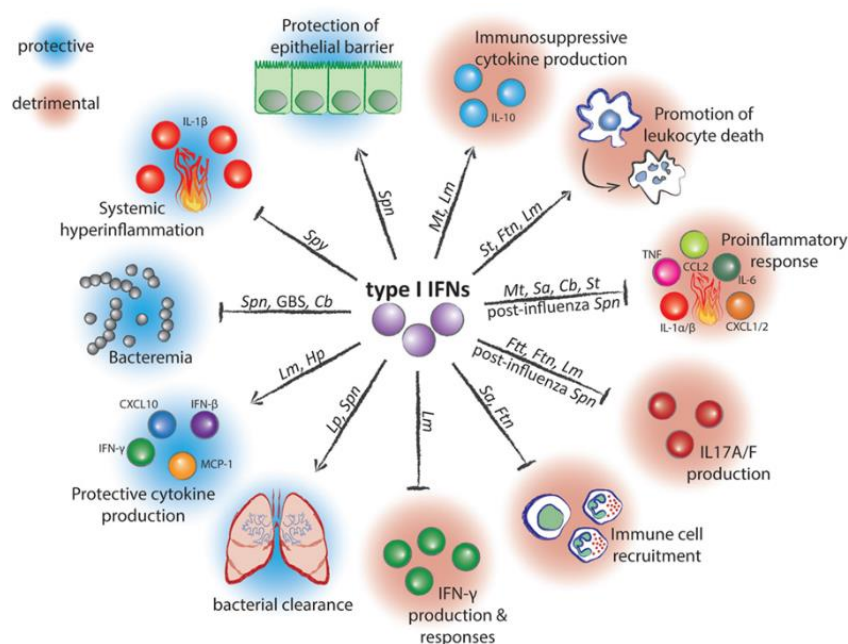
CNS inflammation





Ordering Information

MILLIPLEX® Kit	Merck KGaA Global Cat. No.	MilliporeSigma North America Cat. No.
This Assay		
Human Interferon Panel	HIFN-130K HIFN-130K-PMX9	HIFN-130K HIFN-130K-PMX9
Related Assays		
Human Cytokine/ Chemokine/Growth Factor Panel A	HCYTA-60K HCYTA-60K-PX38 HCYTA-60K-PXBK38 HCYTA-60K-PX48 HCYTA-60K-PXBK48	
Human Cytokine/ Chemokine/Growth Factor Panel B	HCYTB-60K HCYTB-60K-PX38 HCYTB-60K-PXBK38 HCYTB-60K-PX48 HCYTB-60K-PXBK48	



Effects of Type I IFNs (IFN ϵ , IFN α 2, IFN β , IFN ω) during bacterial infection. Note protective and inflammatory responses with cytokines found in MILLIPLEX® Panel A and B.

<https://www.frontiersin.org/articles/10.3389/fimmu.2016.00652/full>

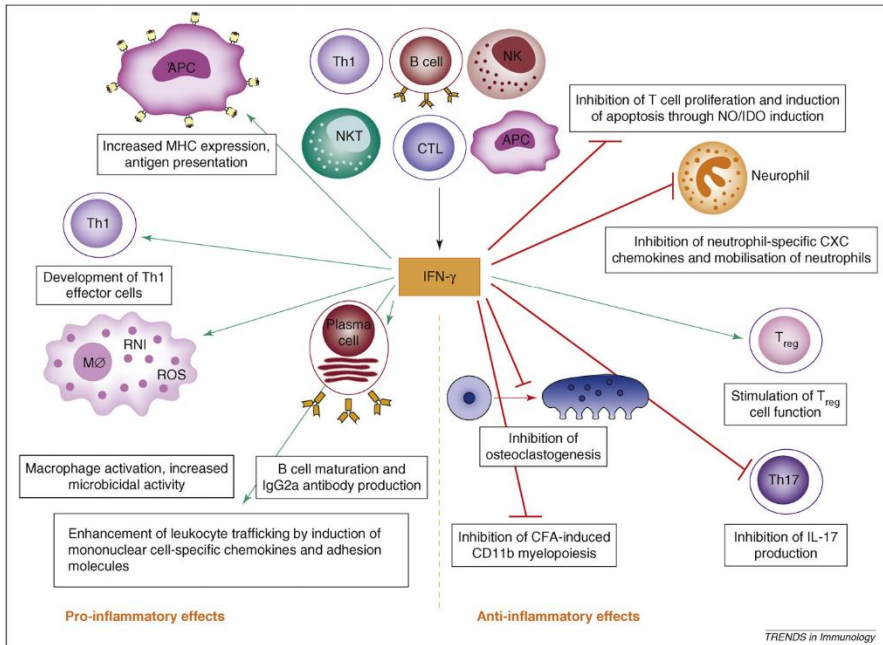
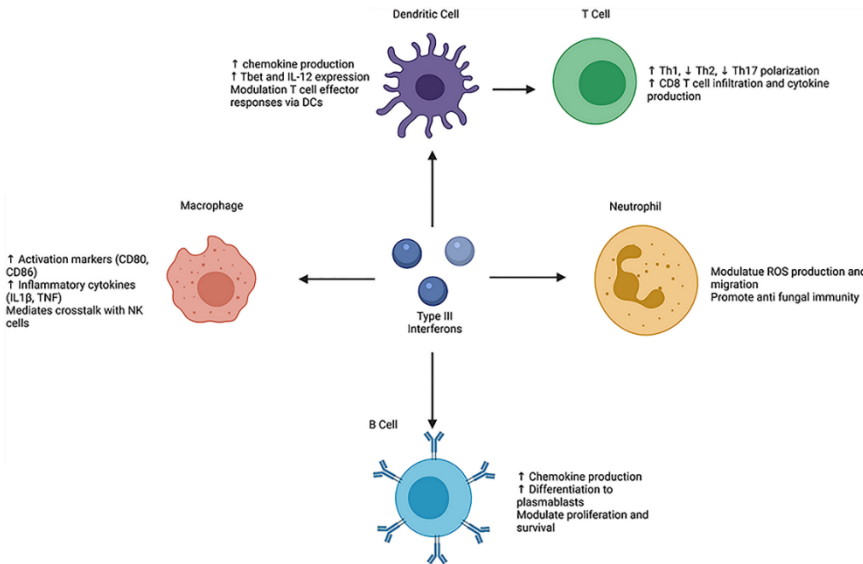


Figure 2. Pro- and anti-inflammatory properties of interferon γ (IFN- γ). This figure summarizes how a single cytokine, IFN- γ , can function both as an inducer and a regulator

IFN γ induces and regulates immune responses.

<https://www.sciencedirect.com/science/article/pii/S1471490608001981?via%3Dihub>



Effects of Type III Interferons (IFN λ 1, λ 2, λ 3)

<https://www.frontiersin.org/articles/10.3389/fimmu.2021.764062/full>



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