

# U-PLEX<sup>®</sup>

## PERSONALIZED MULTIPLEXING

NEW Assays  
Inside

### U-DECIDE

The flexibility of the U-PLEX<sup>®</sup> platform empowers you to make personalized multiplex assays. Confidently run custom 96- or 384-well multiplex assays without upfront development time or costs.

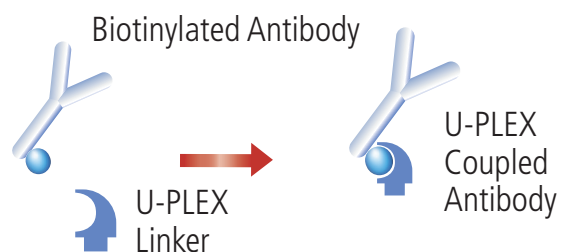
Discover new combinations of results with the quality and performance you expect from MSD.

### U-PLEX

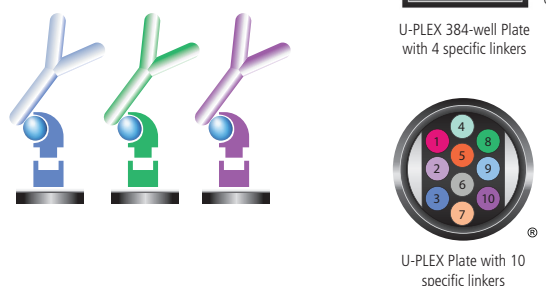
- Design and build your personalized multiplex quickly and easily with the assays that are right for your study
- Create custom combinations from a selection of MSD<sup>®</sup> assays, your own antibodies, or both
- Easy workflow and simple protocol similar to ELISA, no spotting required
- Compatible with all MSD<sup>®</sup> instruments and software
- Open platform: compatible with antibodies, proteins, peptides, carbohydrates, nucleic acids, and oligonucleotides

### U-BUILD

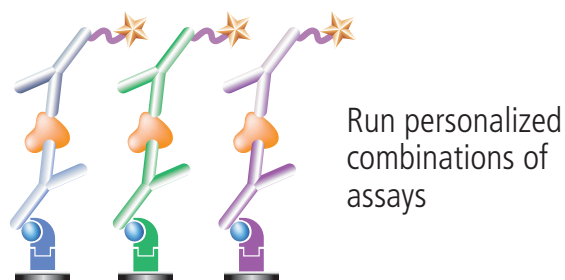
#### 1. COUPLE



#### 2. COAT



#### 3. COMPLETE



It's All About 

# U-PLEX Biomarker Groups 1, 2, and 3 Assays

U-PLEX Biomarker Groups encompass assays for popular analytes including cytokines, chemokines, and growth factors.

Human Biomarkers		Human Biomarkers		Human Biomarkers	
Analyte	LLOD - ULOD pg/mL	Analyte	LLOD - ULOD pg/mL	Analyte	LLOD - ULOD pg/mL
A2M	13.2 – 32,000	IL-2R $\alpha$	10 – 55,000	MCP-2	0.11 – 2,000
Adiponectin	1.46 – 5,000	IL-3	11 – 16,000	MCP-3	0.79 – 5,000
ApoA1	4.93 – 25,000	IL-4	0.08 – 2,100	MCP-4	7.5 – 3,800
ApoC3	1.06 – 10,000	IL-5	0.24 – 4,000	M-CSF	0.29 – 2,000
CA1	1.01 – 6,000	IL-6	0.33 – 2,000	MDC	8.4 – 20,100
Clusterin	57.7 – 500,000	IL-7	1.5 – 7,000	MIF	4.3 – 27,000
Complement C9	10.3 – 70,000	IL-8	0.15 – 2,200	MIP-1 $\alpha$	7.7 – 4,200
Complement factor D	0.31 – 3,000	IL-9	0.14 – 1,500	MIP-1 $\beta$	1.5 – 1,600
CRP	0.92 – 2,170	IL-10	0.14 – 3,700	MIP-3 $\alpha$	1.8 – 20,800
CTACK	1.8 – 4,200	IL-12/IL-23p40	2.8 – 21,000	MIP-3 $\beta$	0.67 – 2,000
Cystatin C	23.9 – 20,000	IL-12p70	0.69 – 5,300	MIP-5	0.34 – 30,000
DPPIV	0.85 – 7,000	IL-13	3.1 – 1,900	NGAL/LCN2	0.78 – 4,000
ENA-78	0.53 – 3,900	IL-15	0.82 – 3,000	RBP4	3.78 – 4,000
Eotaxin	3.2 – 4,800	IL-16	6.6 – 21,500	SAA	1.60 – 16,200
Eotaxin-2	3.1 – 6,000	IL-17A	2.6 – 23,400	SDF-1 $\alpha$	280 – 103,000
Eotaxin-3	7.3 – 21,400	IL-17A/F	1.8 – 18,400	Serpin A1	5.52 – 22,000
EPO	1.8 – 20,000	IL-17B	0.79 – 4,000	SHBG	3.52 – 25,000
Factor VII	0.60 – 6,000	IL-17C	2.2 – 20,000	sTfR-1	0.29 – 3,000
FLT3L	0.49 – 6,000	IL-17D	4.8 – 40,000	TARC	0.51 – 2,200
Fractalkine	100 – 181,000	IL-17E/IL-25	0.58 – 9,200	TGF- $\beta$ 1	9.1 – 37,000
G-CSF	1.6 – 20,400	IL-17F	160 – 112,000	TGF- $\beta$ 2	2.5 – 38,900
GM-CSF	0.12 – 9,400	IL-18	2.5 – 42,000	TGF- $\beta$ 3	1.4 – 38,600
GRO- $\alpha$	0.25 – 2,500	IL-21	1.2 – 12,600	TNF- $\alpha$	0.54 – 3,700
I-309	6.8 – 3,000	IL-22	0.13 – 3,400	TNF- $\beta$	0.47 – 4,300
ICAM-1	0.11 – 1,930	IL-23	1.4 – 21,600	TPO	19 – 40,400
IFN- $\alpha$ 2a	4.0 – 42,400	IL-27	9.6 – 50,600	TRAIL	0.66 – 10,000
IFN- $\beta$	3.1 – 100,000	IL-29/IFN- $\lambda$ 1	1.2 – 11,800	TSLP	0.20 – 10,100
IFN- $\gamma$	1.7 – 17,000	IL-31	7.3 – 11,100	VCAM-1	7.78 – 20,500
IL-1 $\alpha$	0.98 – 5,100	IL-33	0.59 – 10,300	VEGF-A	2.0 – 4,900
IL-1 $\beta$	0.15 – 3,800	IP-10	0.49 – 6,000	vWF	67.4 – 1,000,000
IL-1RA	1.7 – 5,000	I-TAC	1.5 – 5,100	YKL-40	0.39 – 5,000
IL-2	0.70 – 1,900	MCP-1	0.74 – 6,600		

# U-PLEX NHP and Mouse Biomarker Groups 1 and 2 Assays

NHP Biomarkers		NHP Biomarkers		Mouse Biomarkers		Mouse Biomarkers	
Analyte	LLOD - ULOD pg/mL	Analyte	LLOD - ULOD pg/mL	Analyte	LLOD - ULOD pg/mL	Analyte	LLOD - ULOD pg/mL
CTACK	1.8 – 4,200	IL-17C	2.2 – 20,000	6CKine/CCL21	1.5 – 4,000	IL-22	1.2 – 1,800
ENA-78	0.36 – 3,900	IL-17D	4.8 – 40,000	BAFF	0.51 – 4,000	IL-23	4.9 – 20,400
Eotaxin	0.30 – 4,800	IL-17F	160 – 112,000	BCA-1/BLC	21 – 32,000	IL-27p28/IL-30	8.7 – 73,300
Eotaxin-2	3.1 – 6,000	IL-18	2.5 – 42,000	CD40	2.6 – 8,000	IL-31	45 – 66,300
Eotaxin-3	7.3 – 21,400	IL-22	0.13 – 3,400	Eotaxin	4.6 – 15,000	IL-33	2.2 – 36,000
FLT3L	0.49 – 6,000	IL-23	1.4 – 21,600	EPO	4.5 – 12,500	IP-10	0.51 – 4,900
Fractalkine	100 – 181,000	IP-10	0.49 – 6,000	GM-CSF	0.16 – 1,000	KC/GRO	4.8 – 16,000
G-CSF	1.5 – 20,400	I-TAC	1.5 – 2,000	IFN- $\alpha$	140 – 100,000	MCP-1	1.4 – 1,400
GM-CSF	0.12 – 9,400	MCP-1	0.74 – 6,600	IFN- $\beta$	5.2 – 6,000	MCP-5/CCL12	0.14 – 1,500
GRO- $\alpha$	0.25 – 2,500	MCP-2	0.11 – 2,000	IFN- $\gamma$	0.16 – 2,900	MDC	13 – 10,000
I-309	6.8 – 3,000	MCP-3	0.79 – 5,000	IL-1 $\beta$	3.1 – 13,000	MIP-1 $\alpha$	0.21 – 2,100
IFN- $\alpha$ 2a	1.7 – 40,800	MCP-4	7.5 – 3,800	IL-2	1.1 – 10,900	MIP-1 $\beta$	13 – 30,800
IFN- $\gamma$	1.7 – 17,000	M-CSF	0.29 – 2,000	IL-4	0.56 – 10,000	MIP-2	0.30 – 2,000
IL-1 $\alpha$	0.60 – 5,100	MDC	8.4 – 20,100	IL-5	0.63 – 2,800	MIP-3 $\alpha$	0.10 – 2,500
IL-1 $\beta$	0.15 – 3,800	MIF	4.3 – 27,000	IL-6	4.8 – 16,000	MMP-9 (total)	49 – 80,000
IL-1RA	1.7 – 5,000	MIP-1 $\alpha$	7.7 – 4,200	IL-9	1.4 – 8,900	NGAL/LCN2	24 – 50,000
IL-2	0.70 – 1,900	MIP-1 $\beta$	1.5 – 1,600	IL-10	3.8 – 22,800	RANTES	0.72 – 2,000
IL-4	0.06 – 2,100	MIP-3 $\alpha$	0.27 – 20,800	IL-12/IL-23p40	1.4 – 20,400	SDF-1 $\alpha$	8.1 – 50,000
IL-5	0.24 – 4,000	MIP-3 $\beta$	0.67 – 2,000	IL-12p70	48 – 89,000	TARC	0.32 – 1,200
IL-6	0.33 – 2,000	MIP-5	0.34 – 30,000	IL-13	2.7 – 22,800	TGF- $\beta$ 1	37 – 37,000
IL-7	1.5 – 7,000	SDF-1 $\alpha$	18 – 103,000	IL-15	24 – 131,000	TGF- $\beta$ 2	2.5 – 38,900
IL-8	0.15 – 2,200	TARC	0.51 – 2,200	IL-16	3.6 – 6,300	TGF- $\beta$ 3	2.5 – 38,600
IL-9	0.14 – 1,500	TGF- $\beta$ 1	9.1 – 37,000	IL-17A	0.30 – 2,100	TNF- $\alpha$	1.3 – 6,200
IL-10	0.14 – 3,700	TGF- $\beta$ 2	2.5 – 38,900	IL-17A/F	0.61 – 10,600	TNF-RI	0.46 – 2,000
IL-12/IL-23p40	2.8 – 21,000	TGF- $\beta$ 3	1.4 – 38,600	IL-17C	2.3 – 45,600	VEGF-A	0.77 – 12,100
IL-12p70	0.54 – 5,300	TNF- $\alpha$	0.54 – 3,700	IL-17E/IL-25	1.6 – 18,900		
IL-13	1.2 – 1,900	TNF- $\beta$	0.47 – 4,300	IL-17F	24 – 52,600		
IL-15	0.82 – 3,000	TPO	19 – 40,400	IL-21	6.5 – 40,600		
IL-16	6.6 – 21,500	TRAIL	0.66 – 10,000				
IL-17A	2.3 – 23,400	VEGF-A	2.0 – 4,900				
IL-17A/F	1.8 – 18,400	YKL-40	0.39 – 5,000				
IL-17B	0.79 – 4,000						

## U-PLEX Biomarker Groups 1, 2, and 3 (continued)

U-PLEX Biomarker Combinations represent popular combinations of analytes, grouped into separate catalog numbers for ordering convenience.

### U-PLEX Biomarker Human Combinations

Name (Cat. No.)	Analytes
Biomarker Group 1 71-Plex (K15081K)	CTACK, ENA-78, Eotaxin, Eotaxin-2, Eotaxin-3, EPO, FLT3L, Fractalkine, G-CSF, GM-CSF, GRO- $\alpha$ , I-309, IFN- $\alpha$ 2a, IFN- $\beta$ , IFN- $\gamma$ , IL-1 $\alpha$ , IL-1 $\beta$ , IL-1RA, IL-2, IL-2R $\alpha$ , IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17B, IL-17C, IL-17D, IL-17E/IL-25, IL-17F, IL-18, IL-21, IL-22, IL-23, IL-27, IL-29/IFN- $\lambda$ 1, IL-31, IL-33, IP-10, I-TAC, MCP-1, MCP-2, MCP-3, MCP-4, M-CSF, MDC, MIF, MIP-1 $\alpha$ , MIP-1 $\beta$ , MIP-3 $\alpha$ , MIP-3 $\beta$ , MIP-5, SDF-1 $\alpha$ , TARC, TNF- $\alpha$ , TNF- $\beta$ , TPO, TRAIL, TSLP, VEGF-A, YKL-40
Biomarker Group 3 21-PLEX (K15391K)	A2M, Adiponectin, ApoA1, ApoC3, CA1, Clusterin, Complement C9, Complement factor D, CRP, Cystatin C, DPPiV, Factor VII, ICAM-1, NGAL/LCN2, RBP4, SAA, Serpin A1, SHBG, sTfR-1, VCAM-1, vWF
Chemokine Combo 1 (K15047K)	Eotaxin, Eotaxin-2, Eotaxin-3, IL-8, IP-10, MCP-1, MCP-2, MCP-3, MCP-4, MDC, MIP-1 $\alpha$ , MIP-1 $\beta$ , TARC
Chemokine Combo 2 (K15046K)	CTACK, ENA-78, Fractalkine, GRO- $\alpha$ , I-309, I-TAC, MIF, MIP-3 $\alpha$ , MIP-3 $\beta$ , MIP-5, SDF-1 $\alpha$
Cytokine Combo 1 (K1504t5K)	GM-CSF, IL-1 $\alpha$ , IL-5, IL-7, IL-12/IL-23p40, IL-15, IL-16, IL-17A, TNF- $\beta$ , VEGF-A
Inflammation Combo 1 (K15387K)	Complement C9, Complement factor D, CRP, ICAM 1, NGAL/LCN2, SAA, VCAM-1
Interferon Combo (K15094K)	IFN- $\alpha$ , IFN- $\beta$ , IFN- $\gamma$ , IL-29/IFN- $\lambda$ 1
Kidney Injury Combo 1 (K15389K)	A2M, Clusterin, Cystatin C, NGAL/LCN2, RBP4, Serpin A1
Macrophage M1 Combo 1 (K15336K)	IL-1 $\beta$ , IL-6, IL-12p70, IL-18, IL-23, IP-10, MCP-1, MIP-1 $\alpha$ , TNF- $\alpha$
Macrophage M2 Combo 1 (K15337K)	Eotaxin-2, IL-4, IL-10, IL-13, M-CSF, MDC, TARC
Proinflammatory Combo 1 (K15049K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70, IL-13, TNF- $\alpha$
Proinflammatory Combo 2 (K15066K)	GM-CSF, IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70
Proinflammatory Combo 3 (K15052K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-6, TNF- $\alpha$
Proinflammatory Combo 4 (K15053K)	IL-1 $\beta$ , IL-6, IL-8, TNF- $\alpha$
T-Cell Combo (K15093K)	GM-CSF, IFN- $\gamma$ , IL-2, IL-4, IL-9, IL-10, IL-13, IL-17A, IL-17E/IL-25, IL-17F, IL-21, IL-22, MIP-3 $\alpha$ , TNF- $\alpha$
TGF- $\beta$ Combo (K15241K)	TGF- $\beta$ 1, TGF- $\beta$ 2, TGF- $\beta$ 3
TH1/TH2 Combo 1 (K15010K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-5, IL-8, IL-10, IL-12p70, IL-13, TNF- $\alpha$
TH17 Combo 1 (K15075K)	IL-17A, IL-17E/IL-25, IL-17F, IL-21, IL-22, IL-23, IL-27, IL-31, IL-33
TH17 Combo 2 (K15076K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-6, IL-10, IL-17A, IL-17E/IL-25, IL-17F, IL-21, IL-22, TNF- $\alpha$
Vascular Injury Combo 1 (K15390K)	CRP, Factor VII, ICAM-1, SAA, VCAM-1
Viral Combo 1 (K15343K)	G-CSF, GM-CSF, IFN- $\alpha$ 2a, IFN- $\beta$ , IFN- $\gamma$ , IL-1 $\beta$ , IL-1RA, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-12p70, IP-10, MCP-1, MIP-1 $\alpha$ , TNF- $\alpha$ , VEGF-A

### U-PLEX Biomarker NHP\* Combinations

Name (Cat. No.)	Analytes
Biomarker Group 1 60-Plex (K15082K)	CTACK, ENA-78, Eotaxin, Eotaxin-2, Eotaxin-3, FLT3L, Fractalkine, G-CSF, GM-CSF, GRO- $\alpha$ , I-309, IFN- $\alpha$ 2a, IFN- $\gamma$ , IL-1 $\alpha$ , IL-1 $\beta$ , IL-1RA, IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17B, IL-17C, IL-17D, IL-17E, IL-18, IL-22, IL-23, IP-10, I-TAC, MCP-1, MCP-2, MCP-3, MCP-4, M-CSF, MDC, MIF, MIP-1 $\alpha$ , MIP-1 $\beta$ , MIP-3 $\alpha$ , MIP-3 $\beta$ , MIP-5, SDF-1 $\alpha$ , TARC, TNF- $\alpha$ , TNF- $\beta$ , TPO, TRAIL, VEGF-A, YKL-40
Chemokine Combo 1 (K15055K)	Eotaxin, Eotaxin-3, IL-8, IP-10, MCP-1, MCP-4, MDC, MIP-1 $\alpha$ , MIP-1 $\beta$ , TARC
Cytokine Combo 1 (K15057K)	GM-CSF, IL-1 $\alpha$ , IL-5, IL-7, IL-12/IL-23p40, IL-15, IL-16, IL-17A, TNF- $\beta$ , VEGF-A
Proinflammatory Combo 1 (K15070K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70, TNF- $\alpha$
T-Cell Combo (K15095K)	GM-CSF, IFN- $\gamma$ , IL-2, IL-4, IL-9, IL-10, IL-13, IL-17A, IL-17F, IL-22, MIP-3 $\alpha$ , TNF- $\alpha$
TGF- $\beta$ Combo (K15243K)	TGF- $\beta$ 1, TGF- $\beta$ 2, TGF- $\beta$ 3
TH1/TH2 Combo (K15080K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-5, IL-8, IL-10, IL-12p70, TNF- $\alpha$
TH17 Combo 1 (K15079K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-5, IL-6, IL-10, IL-17A, TNF- $\alpha$
Viral Combo 1 (K15344K)	G-CSF, GM-CSF, IFN- $\alpha$ 2a, IFN- $\gamma$ , IL-1 $\beta$ , IL-1RA, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-12p70, IP-10, MCP-1, MIP-1 $\alpha$ , TNF- $\alpha$ , VEGF-A

\* NHP assays recognize analytes from *Cynomolgus* and *Rhesus* monkeys.

### U-PLEX Biomarker Mouse Combinations

Name (Cat. No.)	Analytes
Biomarker Group 1 29-Plex (K15355K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-5, IL-6, IL-9, IL-10, IL-12p70, IL-15, IL-16, IL-17A, IL-17C, IL-17E, IL-17A/F, IL-17F, IL-21, IL-22, IL-23, IL-27, IL-31, IL-33, IP-10, KC/GRO, MCP-1, MIP-1 $\alpha$ , MIP-2, MIP-3 $\alpha$ , TNF- $\alpha$
Biomarker Group 1 50-Plex (K15322K)	6CKine/CCL21, BAFF, BCA-1/BLC, CD40, Eotaxin, EPO, GM-CSF, IFN- $\alpha$ , IFN- $\beta$ , IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-5, IL-6, IL-9, IL-10, IL-12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17C, IL-17E/IL-25, IL-17F, IL-21, IL-22, IL-23, IL-27p28/IL-30, IL-31, IL-33, IP-10, KC/GRO, MCP-1, MCP-5/CCL12, MDC, MIP-1 $\alpha$ , MIP-1 $\beta$ , MIP-2, MIP-3 $\alpha$ , MMP-9 (total), NGAL/LCN2, RANTES, SDF-1 $\alpha$ , TARC, TNF-R1, TNF- $\alpha$ , VEGF-A
Chemokine Combo 1 (K15321K)	IP-10, KC/GRO, MCP-1, MIP-1 $\alpha$ , MIP-1 $\beta$ , MIP-2, MIP-3 $\alpha$ , MDC
Chemokine Combo 2 (K15319K)	6CKine/CCL21, BCA-1/BLC, MCP-5/CCL12, RANTES, SDF-1 $\alpha$ , TARC
Interferon Combo (K15320K)	IFN- $\alpha$ , IFN- $\beta$ , IFN- $\gamma$
Macrophage M1 Combo 1 (K15408K) <b>NEW</b>	IL-1 $\beta$ , IL-6, IL-12p70, IL-15, TNF- $\alpha$ , IL-23, IP-10, MCP-1, MIP-1 $\alpha$
Macrophage M1 Combo 2 (K15409K) <b>NEW</b>	IL-4, IL-10, IL-13, MDC, TARC
T-Cell Combo (K15098K)	GM-CSF, IFN- $\gamma$ , IL-2, IL-4, IL-9, IL-10, IL-13, IL-17A, IL-17E/IL-25, IL-17F, IL-21, IL-22, MIP-3 $\alpha$ , TNF- $\alpha$
TGF- $\beta$ Combo (K15242K)	TGF- $\beta$ 1, TGF- $\beta$ 2, TGF- $\beta$ 3
TH1/TH2 Combo 1 (K15071K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-5, IL-10, IL-12p70, IL-13, KC/GRO, TNF- $\alpha$
TH17 Combo 1 (K15077K)	IL-17A, IL-17C, IL-17E/IL-25, IL-17F, IL-21, IL-22, IL-23, IL-31, IL-33
TH17 Combo 2 (K15078K)	IFN- $\gamma$ , IL-1 $\beta$ , IL-6, IL-17A, IL-17C, IL-17E/IL-25, IL-17F, IL-21, IL-22, TNF- $\alpha$
TH17 Combo 3 (K15354K)	IL-16, IL-17A, IL-17C, IL-17E, IL-17F, IL-21, IL-22, IL-23, IL-31, MIP-3 $\alpha$

# U-PLEX Immuno-Oncology Group 1 Assays

Therapies using genetically modified T-cells have proven to be effective against certain hematologic malignancies. Antibodies that bind to checkpoint ligands and receptors have immensely increased the effectiveness of drug treatments and cell therapies against many types of cancers.

MSD provides solutions that address your Immuno-Oncology research needs. The U-PLEX platform offers a wide range of singleplex and multiplex assays in preconfigured or customizable options, including an extensive menu of effector and target cell checkpoint proteins.

Human Biomarkers		Human Biomarkers		Human Biomarkers		Human Biomarkers	
Analyte	LLOD - ULOD pg/mL	Analyte	LLOD - ULOD pg/mL	Analyte	LLOD - ULOD pg/mL	Analyte	LLOD - ULOD pg/mL
APRIL/TNFSF13	7.47 – 45,000	gp130 (soluble)	5.8 – 188,000	Nectin-4	1.61 – 10,000	RANTES	0.41 – 1,500
BAFF-R/TNFRSF13C	1.4 – 14,000	Granzyme A	0.49 – 3,700	OX40/TNFRSF4	0.26 – 1,800	S100A12	0.1 – 750
BCMA/TNFRSF17	0.13 – 600	Granzyme B	0.10 – 750	P-Selectin	10.5 – 40,000	Tie-2	2.9 – 29,000
CD20	5.7 – 80,000	HAVCR2/TIM-3	2.1 – 9,500	PD1 (epitope 1)	0.25 – 2,500	TIGIT	0.36 – 3,500
CD27	0.41 – 3,400	HVEM/TNFRSF14	0.53 – 5,000	PD1 (epitope 2)	0.11 – 2,200	TLR1	4.4 – 37,000
CD276/B7-H3	4.0 – 40,000	ICOS	1.78 – 9,000	PD-L1 (epitope 1)	0.09 – 1,100	TNF-RI	0.15 – 1,000
CD28	14 – 144,000	ICOS-L/B7-H2	0.98 – 12,000	PD-L1 (epitope 2)	0.55 – 1,500	TNF-RII	1.6 – 7,000
CD40L (soluble)	0.23 – 1,800	LAG3	6.8 – 36,000	PD-L2	3.9 – 41,000	VEGF-D	0.30 – 1,500
CTLA-4	0.12 – 1,500	LIGHT/TNFSF14	0.58 – 5,000	Pentraxin 3	11.7 – 40,000	VEGFR-1/Flt-1	2.69 – 15,000
E-Selectin	45 – 200,000	MIG	0.73 – 4,000	Perforin	1.92 – 20,000		
FGF (basic)	2.1 – 1,200	MMP-1	1.35 – 15,000	PIGF	0.19 – 1,200		
Galectin-9	0.41 – 5,500	MMP-2	10.4 – 25,000	proMMP-9	1.42 – 15,000		
GITR/TNFRSF18	0.18 – 1,300	MMP-7	1.83 – 9,000	RAGE (soluble)	0.26 – 2,000		
GITRL/TNFSF18	0.09 – 1,000	MMP-9 (total)	0.88 – 15,000	RANKL/TNFSF11	1.8 – 4,000		

## U-PLEX Immuno-Oncology Combinations

Name (Cat. No.)	Analytes
Angiogenesis Combo 1 (K15339K)	FGF (basic), PIGF, Tie-2, VEGF-A, VEGF-D
CAR-T Cell Combo 1 (K15338K)	GM-CSF, Granzyme A, Granzyme B, IFN- $\gamma$ , IL-2, TNF- $\alpha$
CAR-T Cell Combo 2 (K15600K) <b>NEW</b>	GM-CSF, Granzyme A, Granzyme B, IFN- $\gamma$ , IL-2, Perforin, TNF- $\alpha$
Effector Cell Checkpoint Combo 1 (K15341K)	CD27, CD28, CD40L (soluble), CTLA-4, GITR/TNFRSF18, HAVCR2/TIM-3, LAG3, OX40/TNFRSF4, PD1 (epitope 1), TIGIT
Immuno-oncology Group 1 134-Plex (K15604K)	APRIL/TNFSF13, BAFF-R/TNFRSF13C, BCMA/TNFRSF17, BDNF, CD20, CD27, CD276/B7-H3, CD28, CD40L (soluble), C-Peptide, CTACK, CTLA-4, ENA-78, Eotaxin, Eotaxin-2, Eotaxin-3, EPO, E-Selectin, FGF (basic), FGF-23, FLT3L, Fractalkine, FSH, Galectin-9, G-CSF, Ghrelin (active), Ghrelin (total), GIP (active), GIP (inactive), GIP (total), GITR/TNFRSF18, GITRL/TNFSF18, GLP-1 (active), GLP-1 (inactive), GM-CSF, gp130 (soluble), Granzyme A, Granzyme B, GRO- $\beta$ /CXCL2, HAVCR2/TIM-3, HVEM/TNFRSF14, I-309, ICOS, ICOS-L/B7-H2, IFN- $\alpha$ 2a, IFN- $\beta$ , IFN- $\gamma$ , IL-10, IL-12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-17A/E, IL-17C, IL-17D, IL-17E/IL-25, IL-17F, IL-18, IL-1RA, IL-1 $\alpha$ , IL-1 $\beta$ , IL-2, IL-21, IL-22, IL-23, IL-27, IL-29/IFN- $\lambda$ 1, IL-2R $\alpha$ , IL-3, IL-31, IL-33, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, Insulin, IP-10, I-TAC, LAG3, Leptin, LIGHT/TNFSF14, Luteinizing Hormone (LH), MCP-1, MCP-2, MCP-4, M-CSF, MDC, MIF, MIG, MIP-1 $\alpha$ , MIP-1 $\beta$ , MIP-5, MMP-1, MMP-2, MMP-7, MMP-9 (total), Nectin-4, OX40/TNFRSF4, PD1 (epitope 1), PD1 (epitope 2), PD-L1 (epitope 1), PD-L1 (epitope 2), PD-L2, Pentraxin 3, Perforin, PIGF, PP, Proinsulin, proMMP-9, P-Selectin, PYY (total), RAGE (soluble), RANKL/TNFSF11, RANTES, S100A12, SDF-1 $\alpha$ , Tie-2, TIGIT, TLR1, TNF-RI, TNF-RII, TNF- $\alpha$ , TNF- $\alpha$ , TPO, TRAIL, TSLP, VEGF-A, VEGF-D, VEGFR-1/Flt-1, YKL-40
Long COVID Combo 1 (K15622K) <b>NEW</b>	IFN- $\beta$ , IFN- $\gamma$ , IL-6, Pentraxin 3
Metastasis Combo 1 (K15602K) <b>NEW</b>	E-Selectin, MMP-1, MMP-2, MMP-7, MMP-9 (total), P-Selectin, VEGFR-1/Flt-1
Oncolysis Combo 1 (K15603K) <b>NEW</b>	CTLA-4, IFN- $\alpha$ 2a, IFN- $\beta$ , IL-1 $\beta$ , IL-2R $\alpha$ , IL-6, IL-8, IP-10, LAG3, MIP-1 $\alpha$ , PD1 (epitope 1), TIGIT
Target Cell Checkpoint Combo 1 (K15340K)	CD276/B7-H3, GITRL/TNFSF18, PD-L1 (epitope 1), PD-L2

## U-PLEX Metabolic Group 1 Assays

The complex pathologies of diabetes, cardiovascular disease, and metabolic syndrome have driven an increased demand for quantitative measurement of biomarkers associated with these disease states. Obesity is directly related to increased risk for diabetes, hypertension, atherosclerosis, and metabolic syndrome. Novel proteomic technologies have helped define key serum biomarkers produced in gut and adipose tissue and altered in abundance in disease states.

MSD provides solutions to support and simplify your metabolic research needs. Assays for Metabolic Human, Mouse, and Rat analytes are available individually or in multiplexes.

Assays that are anchored to NIBSC/WHO International Standards are indicated in the tables below. Additional information on the NIBSC/WHO International Standards is provided in the U-PLEX metabolic product inserts available on the website.

### U-PLEX Metabolic Group 1 Human Biomarkers

Analyte	LLOD - ULOD	Units	Analyte	LLOD - ULOD	Units
BAFF	0.05 – 500	pg/mL	GIP (total)	3.7 – 12,500	pg/mL
BDNF*	0.72 – 2,000	pg/mL	GLP-1 (active)	0.01 – 57	pM
β-NGF*	0.05 – 498	pg/mL	GLP-1 (inactive)	1.5 – 576	pM
C-Peptide*	14 – 7,610	pg/mL	GLP-1 (total)	0.59 – 576	pM
FGF-21	2.8 – 8,230	pg/mL	Glucagon*	0.13 – 156	pM
FGF-23	0.75 – 3,000	pg/mL	Insulin*	0.32 – 736	μIU/mL
FSH	9.0 – 75,000	μIU/mL	Leptin*	14 – 47,500	pg/mL
Ghrelin (active)	13 – 7,160	pg/mL	LH*	1.6 – 27,700	μIU/mL
Ghrelin (total)	1.7 – 2,710	pg/mL	PP	0.19 – 1,830	pg/mL
GIP (active)	1.3 – 1,920	pg/mL	Proinsulin*	0.05 – 130	pM
GIP (inactive)	27 – 12,500	pg/mL	PYY (total)	2.7 – 2,260	pg/mL

\*Assays are anchored to NIBSC/WHO International Standards.

### U-PLEX Metabolic Group 1 Mouse Biomarkers

Analyte	LLOD - ULOD	Units
BDNF*	0.72 – 2,000	pg/mL
C-Peptide	220 – 125,000	pg/mL
FGF-21	2.8 – 8,230	pg/mL
Ghrelin (active)	13 – 7,160	pg/mL
Ghrelin (total)	1.7 – 2,710	pg/mL
GLP-1 (active)	0.14 – 57.0	pM
GLP-1 (inactive)	1.5 – 576	pM
GLP-1 (total)	0.59 – 576	pM
Glucagon*	0.13 – 156	pM
Insulin	3.0 – 5,500	μIU/mL
Leptin	11 – 50,000	pg/mL
PYY (total)	1.1 – 4,000	pg/mL

\*Assays are anchored to NIBSC/WHO International Standards.

### U-PLEX Metabolic Group 1 Rat Biomarkers

Analyte	LLOD - ULOD	Units
BDNF*	0.72 – 2,000	pg/mL
C-Peptide	220 – 125,000	pg/mL
FGF-21	2.8 – 8,230	pg/mL
Ghrelin (active)	13 – 7,160	pg/mL
Ghrelin (total)	1.7 – 2,710	pg/mL
GLP-1 (active)	0.14 – 57.0	pM
GLP-1 (inactive)	1.5 – 576	pM
GLP-1 (total)	0.59 – 576	pM
Glucagon*	0.13 – 156	pM
Insulin	3.0 – 5,500	μIU/mL
Leptin	11 – 50,000	pg/mL
PYY (total)	1.1 – 4,000	pg/mL

\*Assays are anchored to NIBSC/WHO International Standards.

Individual assays can be configured into customized multiplex combinations of your choice.

Additional assays that are compatible with the above assays are available on the U-PLEX platform. View our complete portfolio and customize your U-PLEX Assay with the Assay Designer at [www.mesoscale.com/U-PLEX](http://www.mesoscale.com/U-PLEX).

# U-PLEX Metabolic Combinations

## U-PLEX Metabolic Human Combinations

Name (Cat. No.)	Analytes
Metabolic Group 1 87-Plex (K15280K)	BAFF, BDNF, $\beta$ -NGF, C-Peptide, CTACK, ENA-78, Eotaxin, Eotaxin-2, Eotaxin-3, EPO, FGF-21, FGF-23, FLT3L, FSH, Fractalkine, G-CSF, Ghrelin (active), Ghrelin (total), GIP (active), GIP (inactive), GIP (total), GLP-1 (active), GLP-1 (inactive), GLP-1 (total), Glucagon, GM-CSF, GRO- $\alpha$ , I-309, IFN- $\alpha$ 2a, IFN- $\beta$ , IFN- $\gamma$ , IL1 $\alpha$ , IL-1 $\beta$ , IL-1RA, IL-2, IL-2R $\alpha$ , IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL9, IL-10, IL12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17C, IL-17D, IL-17E/IL-25, IL-17F, IL-18, IL-21, IL-22, IL-23, IL-27, IL-29/IFN- $\lambda$ 1, IL-31, IL-33, Insulin, IP-10, Leptin, LH, MCP-1, MCP-2, MCP-4, M-CSF, MDC, MIF, MIP-1 $\alpha$ , MIP-5, PP, Proinsulin, PYY (total), SDF-1 $\alpha$ , TARC, TNF- $\alpha$ , TNF- $\beta$ , TPO, TRAIL, TSLP, VEGF-A, YKL-40
Adipokine Combo 1 (K15276K)	BDNF, $\beta$ -NGF, IL-1 $\beta$ , IL-6, IL-8, IL-10, Insulin, Leptin, MCP-1, TNF- $\alpha$
Diabetes Combo 1 (K15274K)	C-Peptide, GIP (total), GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Diabetes Combo 2 (K15275K)	C-Peptide, GIP (total), GLP-1 (active), Glucagon, Insulin, Leptin, PYY (total)
Metabolic Combo 1 (K15281K)	BAFF, BDNF, $\beta$ -NGF, C-Peptide, FGF-21, FGF-23, FSH, Ghrelin (active), Ghrelin (total), GIP (active), GIP (inactive), GIP (total), GLP-1 (active), GLP-1 (inactive), GLP-1 (total), Glucagon, Insulin, Leptin, LH, PP, Proinsulin, PYY (total)
Metabolic Combo 2 (K15388K)	Adiponectin, ApoA1, ApoC3, Clusterin, CRP, DPPIV, NGAL/LCN2, RBP4, SHBG, sTfR-1
Metabolic 2-Plex Combo 1 (K15282K)	Insulin, Leptin
Metabolic 3-Plex Combo 1 (K15283K)	GLP-1 (active), Glucagon, Insulin
Metabolic 4-Plex Combo 1 (K15284K)	GLP-1 (active), Glucagon, Insulin, Leptin
Obesity Combo 1 (K15277K)	BDNF, FGF-21, Ghrelin (total), Glucagon, Leptin
Obesity Combo 2 (K15278K)	C-Peptide, FGF-23, Ghrelin (total), GLP-1 (total), Insulin, Leptin, PYY (total)

## U-PLEX Metabolic Mouse Combinations

Name (Cat. No.)	Analytes
Metabolic Group 1 58-Plex (K15317K)	BAFF, BCA-1/BLC, BDNF, CD40, C-Peptide, Eotaxin, EPO, FGF-21, Ghrelin (active), Ghrelin (total), GLP-1 (active), GLP-1 (inactive), GLP-1 (total), Glucagon, GM-CSF, IFN- $\alpha$ , IFN- $\beta$ , IFN- $\gamma$ , IL-1 $\beta$ , IL-2, IL-4, IL-5, IL-6, IL-9, IL-10, IL-12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17C, IL-17E/IL-25, IL-17F, IL-21, IL-22, IL-23, IL-27p28/IL-30, IL-31, IL-33, Insulin, IP-10, KC/GRO, Leptin, MCP-1, MCP-5/Cd12, MDC, MIP-1 $\alpha$ , MIP-1 $\beta$ , MIP-2, MIP-3 $\alpha$ , MMP-9 (total), PYY (total), RANTES, TARC, TNF- $\alpha$ , VEGF-A
Adipokine Combo 1 (K15299K)	BDNF, IL-1 $\beta$ , IL-6, IL-10, Insulin, Leptin, MCP-1, TNF- $\alpha$
Diabetes Combo 1 (K15298K)	C-Peptide, GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Gut Hormone Combo 1 (K15307K)	Ghrelin (active), GLP-1 (active), Glucagon, Insulin, Leptin, PYY (total)
Metabolic Combo 1 (K15297K)	BAFF, BDNF, C-Peptide, FGF-21, Ghrelin (active), Ghrelin (total), GLP-1 (active), GLP-1 (inactive), GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Metabolic 2-Plex Combo 1 (K15302K)	Insulin, Leptin
Metabolic 2-Plex Combo 2 (K15303K)	Glucagon, Insulin
Metabolic 3-Plex Combo 1 (K15304K)	GLP-1 (total), Glucagon, Insulin
Metabolic 3-Plex Combo 2 (K15305K)	GLP-1 (active), Glucagon, Insulin
Metabolic Hormones Combo 1 (K15306K)	C-Peptide, Ghrelin (active), GLP-1 (active), Glucagon, IL-6, Insulin, Leptin, MCP-1, PYY (total), TNF- $\alpha$
Obesity Combo 1 (K15300K)	BDNF, FGF-21, Ghrelin (total), Glucagon, Leptin
Obesity Combo 2 (K15301K)	C-Peptide, Ghrelin (total), GLP-1 (total), Insulin, Leptin, PYY (total)

## U-PLEX Metabolic Rat Combinations

Name (Cat. No.)	Analytes
Metabolic Combo 1 (K15308K)	BDNF, C-Peptide, FGF-21, Ghrelin (active), Ghrelin (total), GLP-1 (active), GLP1 (inactive), GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Diabetes Combo 1 (K15309K)	C-Peptide, GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Metabolic 2-Plex Combo 1 (K15312K)	Insulin, Leptin
Metabolic 2-Plex Combo 2 (K15313K)	Glucagon, Insulin
Metabolic 3-Plex Combo 1 (K15314K)	GLP-1 (total), Glucagon, Insulin
Metabolic 3-Plex Combo 2 (K15315K)	GLP-1 (active), Glucagon, Insulin
Metabolic Hormones Combo 1 (K15316K)	C-Peptide, Ghrelin (active), GLP-1 (active), Glucagon, Insulin, Leptin, PYY (total)
Obesity Combo 1 (K15310K)	BDNF, FGF-21, Ghrelin (total), Glucagon, Leptin
Obesity Combo 2 (K15311K)	C-Peptide, Ghrelin (total), GLP-1 (total), Insulin, Leptin, PYY (total)

# Customize Your U-PLEX Assay With The U-PLEX Assay Designer

The U-PLEX platform allows you to create custom panels quickly in your own lab from a selection of MSD assays, your own antibodies, or a combination of both.

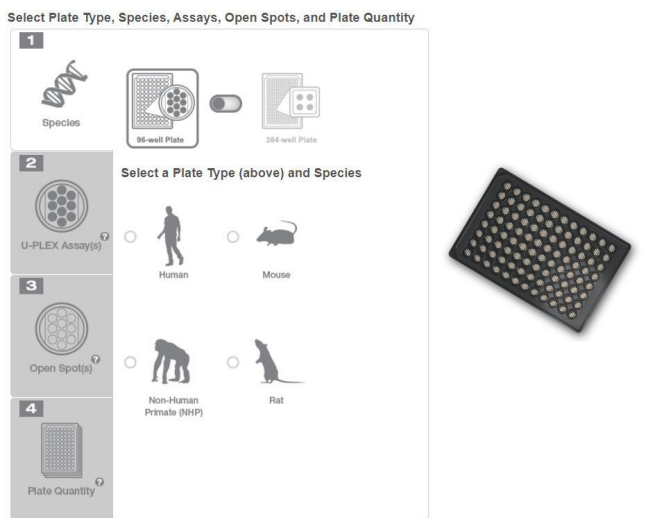
**Step 1.** Choose your species and group of interest to see available assays.

**Step 2.** Select desired assays from the U-PLEX assay list.

**Step 3.** If you will be using your own antibodies, select the number of open spots required.

**Step 4.** Select your plate quantity.

Explore your customization options at [www.mesoscale.com/U-PLEXDesigner](http://www.mesoscale.com/U-PLEXDesigner)



## U-PLEX Custom Assays

U-PLEX Assays within a group may be selected to form a custom multiplex. Open spots enable the creation of custom multiplexes that combine U-PLEX assays with assays for R-PLEX or your own analytes.

Species	Name	Cat. No.	
		96-well	384-well
Human	Biomarker Group 1	K15067M	K25067M
Human	Biomarker Group 2	K151ADM	K251ADM
Human	Biomarker Group 3	K151AGM	K251AGM
Human	Immuno-Oncology Group 1	K151AEM	K251AEM
Human	Metabolic Group 1	K151ACM	K251ACM
Mouse	Biomarker Group 1	K15069M	K25069M
Mouse	Biomarker Group 2	K152ADM	K252ADM
Mouse	Metabolic Group 1	K152ACM	K252ACM
NHP	Biomarker Group 1	K15068M	K25068M
NHP	Biomarker Group 2	K156ADM	K256ADM
Rat	Metabolic Group 1	K153ACM	K253ACM

## U-PLEX Development Packs

Perform custom multiplexing with your own analytes, with 2 to 10 activated spots per well.

Name	Cat. No.
2-Assay SECTOR® Plate	K15227/N
3-Assay SECTOR Plate	K15228N
4-Assay SECTOR Plate	K15229N
5-Assay SECTOR Plate	K15230N
6-Assay SECTOR Plate	K15231N
7-Assay SECTOR Plate	K15232N
8-Assay SECTOR Plate	K15233N
9-Assay SECTOR Plate	K15234N
9-Assay SECTOR Plate	K15235N
384-well, 2-Assay Plate <b>NEW</b>	K25227N
384-well, 3-Assay Plate <b>NEW</b>	K25228N
384-well, 4-Assay Plate <b>NEW</b>	K25229N



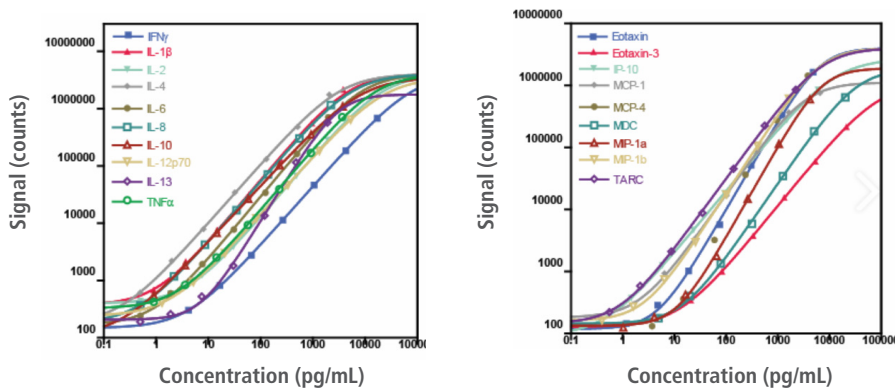
# U-PLEX Assays: Built on Quality Components

The U-PLEX technology is an open and highly flexible platform that delivers the quality for which MSD is known. Every order is filled with proven, high quality components that have been thoroughly characterized. U-PLEX assays are designed, developed, and manufactured under MSD's Quality Management System.

Rigorous quality standards are applied and a wide range of performance measurements are taken during the development of every U-PLEX assay. Representative data for three performance measurements are presented below. In addition, precision, spike recovery, cross reactivity, and dilution linearity are also characterized.

## Biomarker Titration

Standard curves and LLODs are generated from at least three experimental runs. U-PLEX curves typically show a 3-4 log dynamic range, allowing quantification in both normal and diseased/stimulated samples with minimal sample dilution.



Typical calibration curves for U-PLEX biomarkers are shown at left.

## Lower Limit of Detection

LLODs for U-PLEX assays range from pg/mL to sub-pg/ml levels.

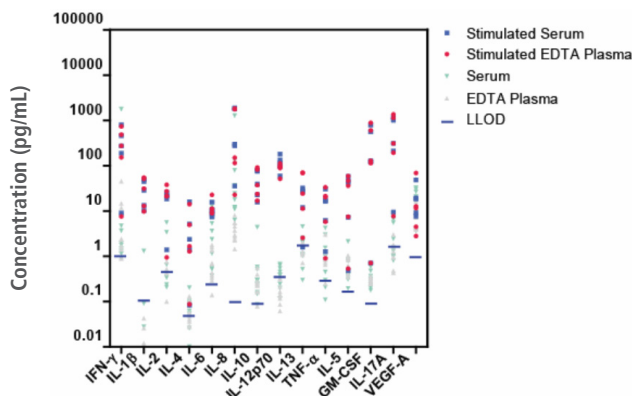
		LLOD (pg/mL)								
Assays	IFN- $\gamma$	IL-1 $\beta$	IL-2	IL-4	IL-6	IL-8	IL-10	IL-12p70	IL-13	TNF- $\alpha$
U-PLEX	1.7	0.15	0.7	0.08	0.33	0.150	0.14	0.69	3.1	0.51

		LLOD (pg/mL)						
Assays	Eotaxin	IP-10	MCP-1	MCP-4	MDC	MIP-1 $\alpha$	MIP-1 $\beta$	TARC
U-PLEX	3.2	0.49	0.74	7.5	8.4	7.7	1.5	0.51

## Native Sample Testing

Testing normal and diseased serum and plasma samples (n>3 of each) is part of every assay development. If an analyte is not detected, samples are spiked with supernatants from cultured PBMCs that have been stimulated to secrete a wide array of biomarkers. Analyte concentrations from each sample are determined and plotted along with the LLOD for each standard.



Native analytes are detectable in normal serum and EDTA plasma and in serum and EDTA plasma that are spiked with culture supernatants obtained from stimulated PBMCs.

## Customer Support

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