

R&D 단백질 Multi-정량 Tool

LUMINEX ASSAY

웅비메디텍 학술마케팅팀

R&D Luminex assay

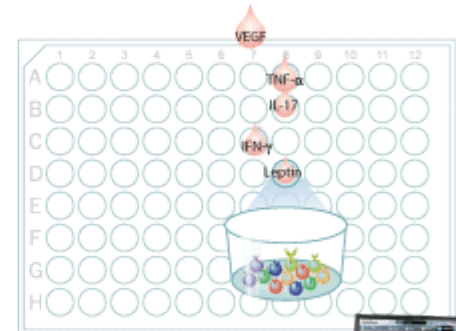
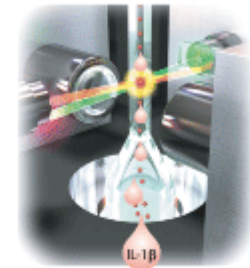
R&D multi-정량 Tool

R&D Luminex assay란?

R&D Luminex Kits

200여개의 Protein 중에서 최대 100개까지 자유롭게 선택!!!

- ✓ Sample 50 μ l로 최대 100개 동시분석
- ✓ R&D Quantikine ELISA (ELISA Gold Standard)와 최고의 correlation
- ✓ Panel Specific control 사용으로 높은 신뢰도 입증
- ✓ Panel Specific diluent 사용으로 정확한 결과 보장

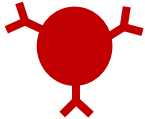
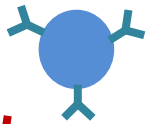


Luminex assay 원리 1)



Luminex technology 이용한 **bead-based multiplex 정량 방법**



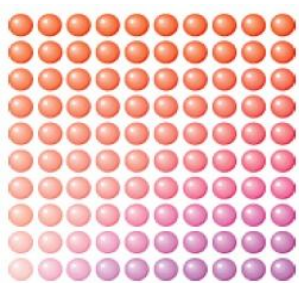
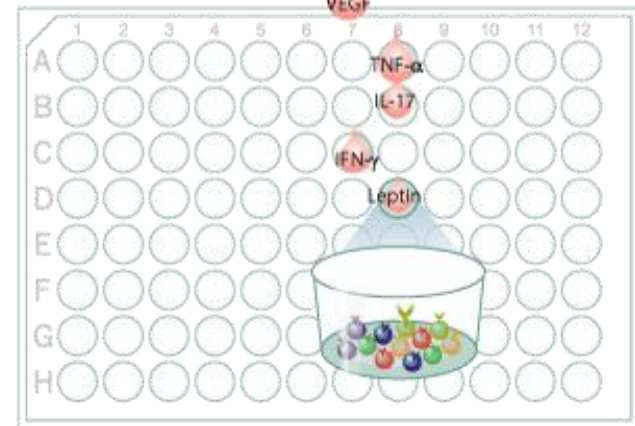
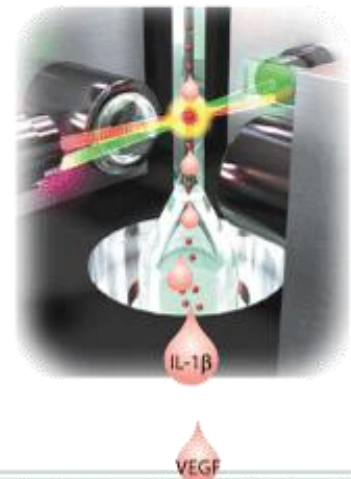
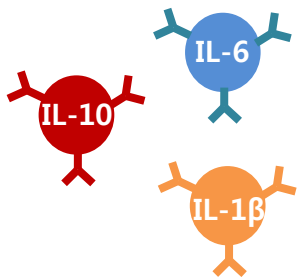
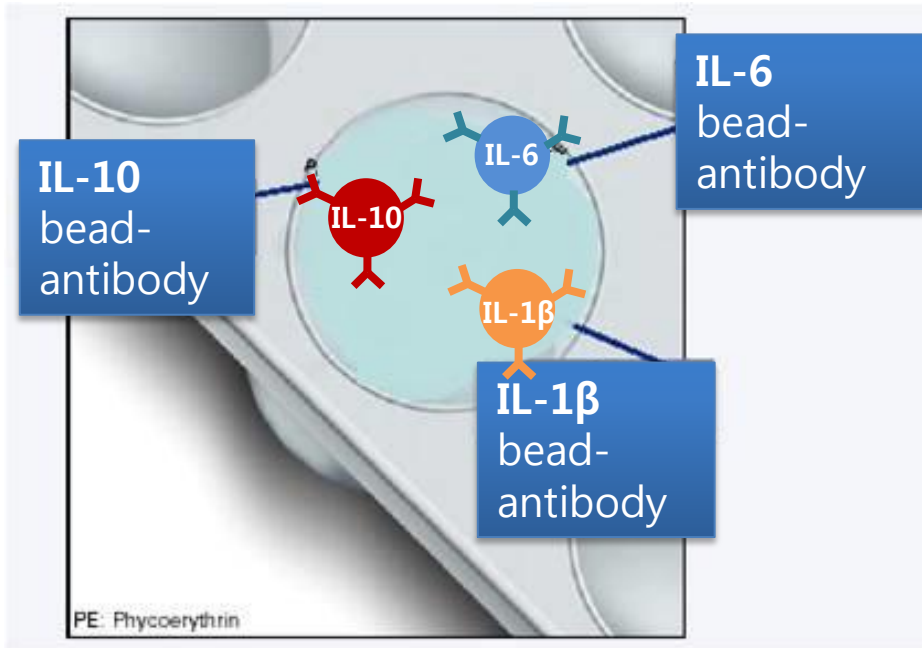
ELISA



ELISA on a Bead

	분석할 protein	Sample수	Data Point	사용할 96-well Plate	필요한 sample양	소요 시간
ELISA	<u>10</u>	<u>40</u>	400	10 	2 mL (100 µL/well * duplicate * 10 plate)	40 hrs 이상
Luminex			400	1 	100 µL (50 µL/well * duplicate •1 plate)	4~5 hrs

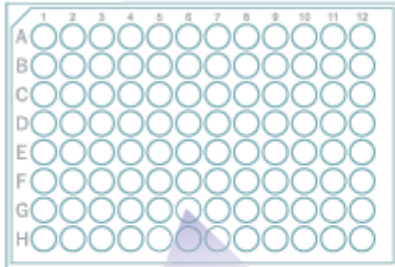
Luminex assay 원리 2)



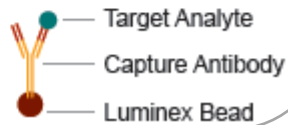
- ✓ 동시 다중 분석 (~100)
- ✓ 효율적인 결과분석
- ✓ 자유로운 target 선택 가능
- ✓ 정확하고 신뢰성 있는 결과

Luminex assay 과정

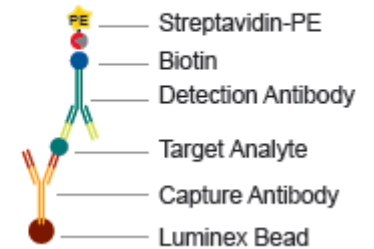
Step 1



Analyte

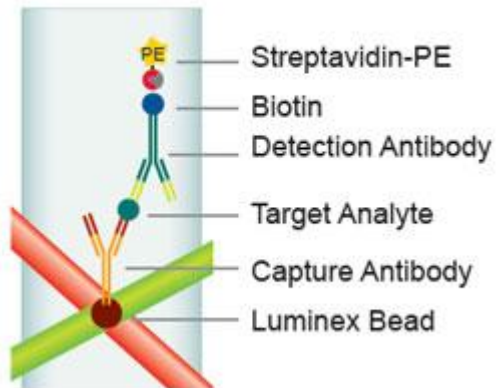


Step 2

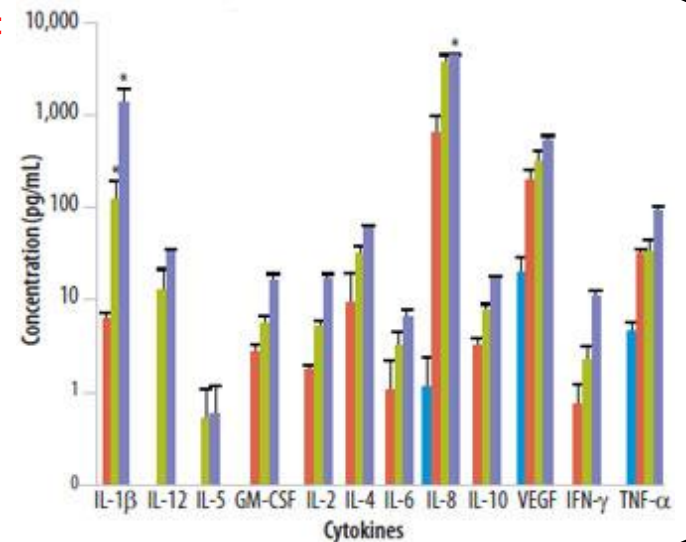


Step 3

Polystyrene or Magnetic



Result

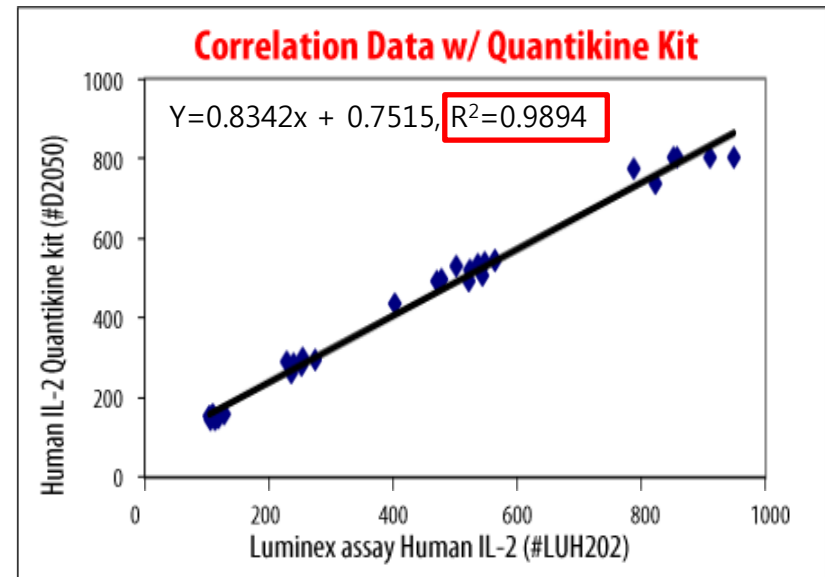
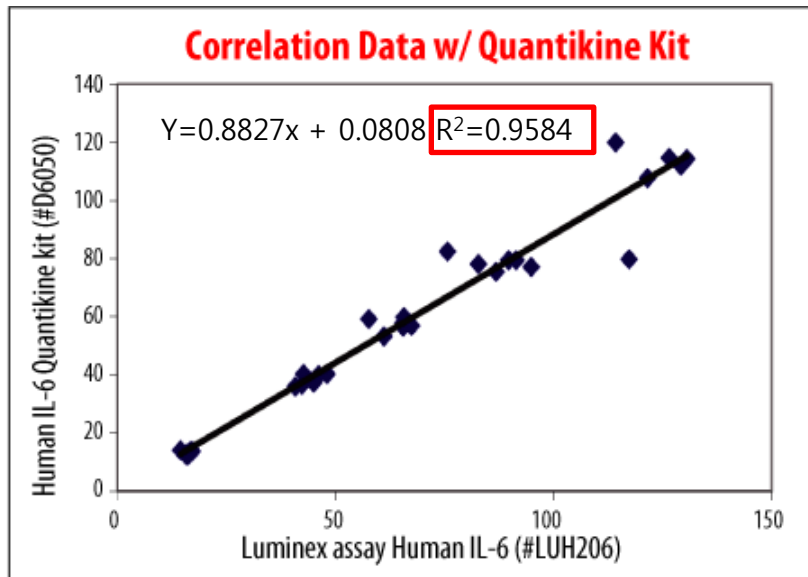


R&D Luminex assay 차별화

R&D multi-정량 Tool

차별화1 | Quantikine ELISA와 Correlation

- **Quantikine ELISA와 높은 Correlation**
 - Quantikine ELISA는 **ELISA의 Gold Standard**
 - Luminex kit 출시 전 Quantikine ELISA와 **동일한 QC test 진행**
 - Luminex & Quantikine ELISA **Correlation data 제공**



차별화2 | R&D 고유의 Diluent

- **고유의 Diluent 사용 → 결과 정확도 증가**
 - Antibody의 non-specific binding 막음
 - Sample 내 특정 물질들의 interference를 막음

HAMA-high				
Analyte	R&D Systems Luminex Assay	Competitor 1	Competitor 2	Competitor 3
TNF- α	—	—	—	—
IFN- γ	—	—	++	—
GM-CSF	—	—	+++	—
IL-10	—	—	++	—
IL-2	—	—	++	—
IL-4	—	—	—	—
IL-5	—	—	—	—
RF-high				
Analyte	R&D Systems Luminex Assay	Competitor 1	Competitor 2	Competitor 3
TNF- α	—	—	++	+
IFN- γ	—	—	++	—
GM-CSF	—	—	+++	—
IL-10	—	—	+	—
IL-2	—	—	++	—
IL-4	—	—	++	+
IL-5	—	—	+	—

- **HAMA**: human anti-mouse antibodies
- **RF**: rheumatoid factor
(류마티스 환자 자가항체)
- + : false positive result

차별화3 | Control 사용 & Anlayte 별 최적화

- 고유의 **control set** 로 결과 신뢰도 입증
- Anlayte **고유의 특성을 고려한 Multiplex**
 - 고유의 Dilution factor 안내
 - Analyte 마다 다른 detectable range

Analyte	Sensitivity (Mean Minimum Detectible Dose; pg/mL)	Standard Curve Range* (pg/mL)	Starting Sample Dilution			Bead Region	
			Cell Culture Supernatants	Serum	Heparin Plasma	Polystyrene	Magnetic
Adiponectin/Acrp30	148	1,346-327,013	1:2	1:200	1:200	25	44
Aggrecan ■	249	200-48,546	1:2	1:2	1:2	47	75
α-Fetoprotein	205	1,021-248,000	1:2	1:2	1:2	41	
Amphiregulin	131	919-223,400	1:2	1:2	1:2	21	37
Angiopoietin-2 ■	17.1	120-29,175	1:2	1:2	1:2	61	26
Angiopoietin-like 3	23.0	185-45,000	1:2	1:2	1:2	42	
Angiopoietin-like 4	86.0	3,461-841,000	1:2	1:2	1:2	43	
APP ■	349	6,296-1,530,000	1:2	1:2	1:2	21	39
BAFF/BLyS/TNFSF13B	5.8	53-12,900	1:2	1:2	1:2	62	27
BCMA ■	1.2	35-8,530	1:2	1:2	1:2	98	75
BMP-2 ■	3.6	19.9-4,832	1:2	1:2	1:2	43	67
BMP-4 ■	5	34.8-8,462	1:2	1:2	1:2	44	72
BMP-9	0.6	45.7-11,108	1:2	1:2	1:2	45	73
CA15-3	0.051 units/mL	0.148-36 units/mL	1:2	1:50	1:50	45	
CA125/MUC16	2.7	28.0-6,800	1:2	1:2	1:2	19	35
Calbindin D ■	12.3	25.3-6,150	1:2	1:2	1:2	17	33
Cardiac Myoglobin	1.3	19.3-4,700	1:2	1:50	1:50	74	42

R&D Luminex assay 제품종류

R&D multi-정량 Tool

- **Human Cytokine A (22)**

- MCP-1, MIP-1 α , MIP-1 β , RANTES, CXCL8, CXCL5, FGF-basic, GM-CSF, G-CSF, IFN- γ , IL-1 α , IL-1ra, IL-1 β , IL-2, IL-4, IL-5, IL-6, IL-10, IL-17, TNF- α , Tpo, VEGF

- **Human Cytokine B (9)**

- CCL11, CD40 Ligand, CXCL10, CXCL11, EGF, HGF, IL-12p70, IL-13, Leptin

- **Human High Sensitivity Cytokine A (12)**

- CXCL8, GM-CSF, IFN- γ , IL-1 β , IL-2, IL-4, IL-5, IL-6, IL-10, IL-12p70, TNF- α , VEGF

- **Human High Sensitivity Cytokine B (18)**

- GM-CSF, IFN- γ , IL-1 β , IL-2, IL-5, IL-6, IL-7, IL-10, IL-13, IL-15, IL-17A, IL-17F, IL-22, IL-23, IL-31, IL-33, IL-36 β , TNF- α

- **Human Angiogenesis (17)**

- Angiogenin, Angiopoietin-1, Antiopoeing-2, BMP-9, EGF, Endothelin-1, FGF-1, FGF-basic, Follistatin, HB-EGF, HGF, IL-8, Leptin, PLGF, VEGF-A, VEGF-C, VEGF-D

- **Human Metastasis (5)**

- DKK-1, GKF15, Osteonectin (SPARC), Periostin, YKL40

- **Human Cancer Biomarker(21)**

- AFP, AntithrombinⅢ, CA125, CA15-3, FGF-basic, FAP, HGF, IGFBP-3, IL-6, IL-8, Leptin, MIF, MPO, Osteopontin, PSA(total), SCF, SHBG, TNF- α , VEGF, sFas, sFasL

- **Human Adhesion (4)**

- sICAM-1, sE-Selectin, sP-Selectin, sVCAM-1

- **Human MMP (10)**

- MMP-1, MMP-2, MMP-3, MMP-7, MMP-8, MMP-9, MMP-10, MMP-12, MMP-13, EMMPRIN

- **Human TIMP (4)**

- TIMP-1, TIMP-2, TIMP-3, TIMP-4

- **Multi-species TGF- β (3)**

- TGF- β 1, TGF- β 2, TGF- β 3

- **Human Obesity (10)**

- Adiponectin, CRP, MCP-1, Complement Factor D, IL-6, IL-10, Leptin, Resistin, Serpin E1, TNF- α

- **Human Diabetes (9)**

- Leptin, Serpin E1/PAI-1, Resistin, Adiponectin/Acrp30, Complement Factor D/Adipsin, FGF-21, RAGE, GDF-15, Renin

- **Human Cardiac A (6)**

- CD40 Ligand, GDF-15, Pappalysin-1/PAPP-A, Proprotein Convertase 9/PCSK9, IL-1R4, TNF RII

- **Human Cardiac B (6)**

- CRP, Cystatin C, MPO, P-Selectin, Serpin E1, TIMP-1

- **Human Kidney Toxicity (9)**

- Clusterin, Cyctatin C, OPN, Fetuin A, Lipocaline-2/NGAL, RBP4, TFF3, TIM-1/KIM-1, CXCL10

- **Human Neurodegenerative disease (8)**

- MPO, Serpin E1(PAI-1), PDGF-AA, ICAM-1, RAGE, CCL5(RANTES), BDNF, GDNF

- **Human Bone (8)**

- DKK-1, IL-1b, IL-6, Insulin, Leptin, OPN, SOST, TNF-a

- **Human Biomarker (9)**

- BAFF, MIP-3 α , CD14, CD27, CXCL13, GP130, IL-2R α , IL-6R α , TNF RII

제품군 | 자유롭게 최대 100개 까지 선택

214 종류

Adiponectin	Aggrecan	α-Fetoprotein	Amphiregulin	Angiogenin	Angiopoietin-1	Angiopoietin-2	Angiopoietin-like 3	Angiopoietin-like 4	APP	B7-H1	β2-Microglobulin
BCMA	BDNF	BMP-2	BMP-4	BMP-9	CA125	CA15-3	Calbindin D	Cardiac Myoglobin	Cardiac Troponin I	CCL2/MCP-1	CCL3/MIP-1α
CCL4/MIP-1β	CCL5	CCL7	CCL8/MCP-2	CCL11	CCL13/MCP-4	CCL14	CCL17	CCL18/PARC	CCL20/MIP-3α	CCL22	CCL24
CCL26	CCL27	CD14	CD27	CD30	CD40	CD40 Ligand	CD163	Chemerin	Chitinase 3-like 1	Protein C	Collagen IVα1
C5a	CFD	CRP	Cripto-1	CXCL1	CXCL4	CXCL5	CXCL6/GCP-2	CXCL8/IL-8	CXCL9	CXCL10	CXCL11
CXCL12	CXCL13	CXCL16	Cystatin C	DcR3	Dkk-1	DPPIV	DR3	EGF	EMMPRIN	Endoglin	Endothelin-1
ENPP-2	EphA2	Epo	E-Selectin	FABP1	FABP3	FABP4	Fas	Fas Ligand	FGF acidic	FGF basic	FGF-21
FLRG	Flt-3 Ligand	Follistatin	Galectin-3	G-CSF	GDF-15	GDNF	Glucagon	GM-CSF	gp130	GH	HB-EGF
HGF	ICAM-1	IFN-γ	IFN-γ R1	IGFBP-1	IGFBP-3	IL-1α	IL-1 beta	IL-1 ra/IL-1F3	IL-1 RI	IL-1 RII	IL-2
IL-2 Rα	IL-3	IL-4	IL-5	IL-6	IL-6 Rα	IL-7	IL-9	IL-10	IL-12 p70	IL-13	IL-15
IL-17A	IL-17E/IL-25	IL-17F	IL-18 BPa	IL-19	IL-22	IL-23	IL-27	IL-28A	IL-31	IL-33	IL-34
IL-36β	Insulin	C-Peptide	Kallikrein 3	Kallikrein 5	Leptin	LIF	Lipocalin-2/NGAL	L-Selectin/CD62L	M-CSF	MFG-E8	MICA
MICB	MIF	MMP-1	MMP-2	MMP-3	MMP-7	MMP-8	MMP-9	MMP-12	MMP-13	MPO	Nephrin
NRG1-β1	NT-Pro-ANP	Oncostatin M	Osteopontin	PDGF-AA	PDGF-BB	Pentraxin 3	Periostin	PIGF	Progranulin	Prolactin	PCSK9
P-Selectin	RAGE	RBP4	Renin	Resistin	ROBO4	SCF	Serpin C1	Serpin E1	SHBG	SOST	SPARC
SP-D	ST2	TACI	Tenascin C	TFF3	TFPI	TfR	Thrombospondin-2	Tie-1	Tie-2	TIM-1	TIMP-1
TNF-α	TNF RI	TNF RII	Tpo	TRAIL	TRAIL R2	TRAIL R3	TRANCE/RANK L	ULBP-1	ULBP-2/5/6	ULBP-3	ULBP-4
uPAR	Uteroglobin	VAP-1	VCAM-1	VEGF	VEGF-C	VEGF-D	VEGF R3	Vitamin D BP	vWF-A2		

Mouse Luminex assay (62)

Adiponectin	CCL11/Eotaxin	CXCL10	FGF-21	IL-1 α	IL-7	IL-33	Periostin	Thrombospondin-4
BAFF	CCL20/MIP-3 α	CXCL12	G-CSF	IL-1 β	IL-9	Leptin	PDGF-BB	TIM-1/KIM-1
CD93	CCL22/MDC	Dkk-1	GDF-15	IL-2	IL-10	Lipocalin-2	PCSK9	TNF- α
CCL2/MCP-1	CRP	EGF R	GM-CSF	IL-4	IL-12 p70	LIX	RAGE	TRANCE
CCL3/MIP-1 α	CXCL1-KC	EMMPRIN	HGF	IL-5	IL-13	M-CSF	Resistin	VEGF
CCL4/MIP-1 β	CXCL2/MIP-2	Epo	IFN- γ	IL-6	IL-17A	MMP-9	S100A8	VEGF R2
CCL5/RANTES	CXCL9/MIG	FGF-basic	IGF-I	IL-6 R α	IL-23 p19	Osteopontin	S100A9	

Rat Luminex assay (17)

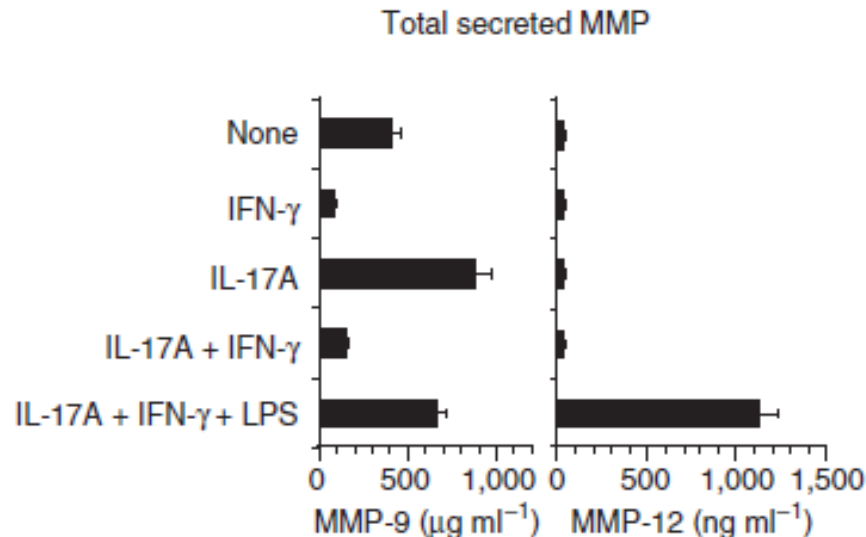
CXCL2/CINC-3	GM-CSF	IFN- γ	IL-1 β	IL-4	IL-10	IL-18	TIMP-1	VEGF
CXCL3/CINC-2 α/β	ICAM-1/CD54	IL-1 α	IL-2	IL-6	IL-13	L-Selectin/CD62L	TNF- α	

Reference 1

- 랑게르한스셀 조직구증식증에서 IL-17A pathway에 따른 MMP 발현 농도 변화

nature
medicine

Langerhans cell histiocytosis reveals a new IL-17A–dependent pathway of dendritic cell fusion



Reference 2

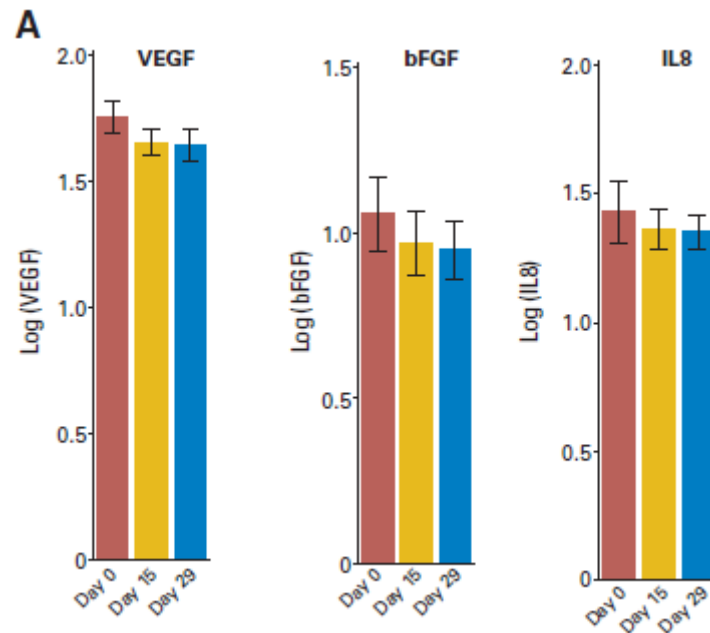
➤ Lung cancer에서 특정 약물(Src inhibitor)의 anti-cancer 효능 임상평가

VOLUME 28 · NUMBER 8 · MARCH 10 2010

JOURNAL OF CLINICAL ONCOLOGY

ORIGINAL REPORT

Phase I/II Study of the Src Inhibitor Dasatinib in Combination With Erlotinib in Advanced Non-Small-Cell Lung Cancer

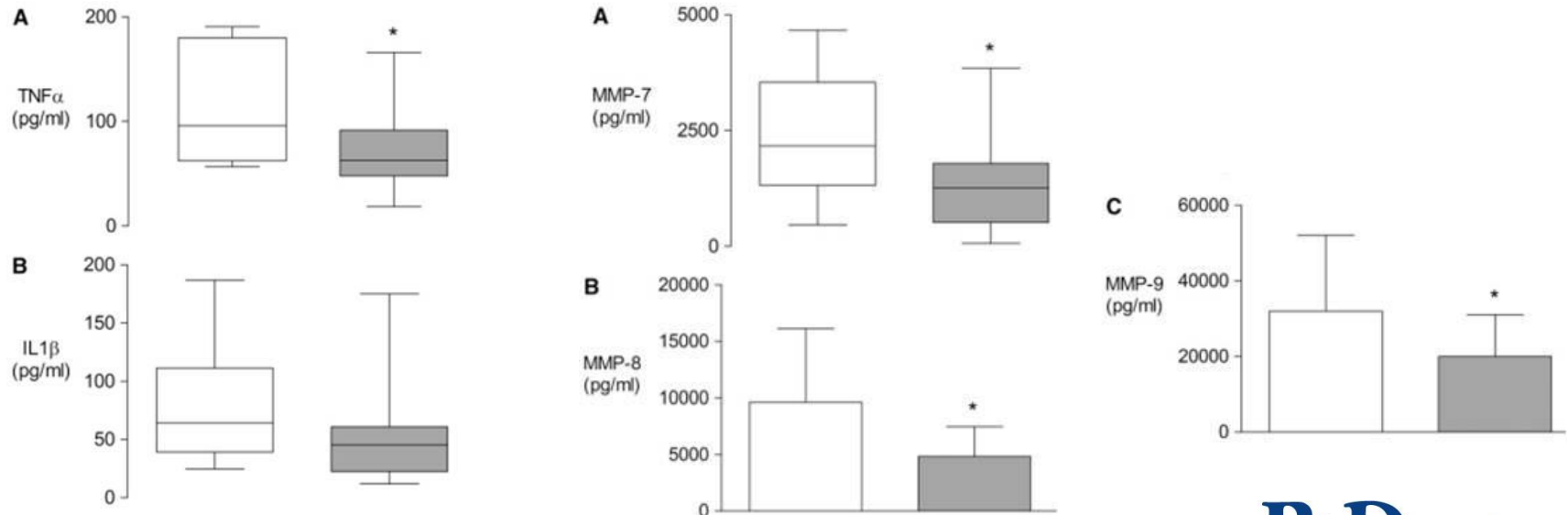


Reference 3

➤ 특정 약물 (Simvastatin)의 염증 억제 효능 임상평가

Simvastatin Decreases Lipopolysaccharide-induced Pulmonary Inflammation in Healthy Volunteers

Murali Shyamsundar¹, Scott T. W. McKeown¹, Cecilia M. O'Kane¹, Thelma R. Craig¹, Vanessa Brown¹, David R. Thickett², Michael A. Matthay³, Clifford C. Taggart¹, Janne T. Backman⁴, J. Stuart Elborn¹, and Daniel F. McAuley¹



관련 기기

- Detection system
 - **Luminex, Bio-plex, MAGPIX (only magnetic bead)**



- Wash Device
 - **Vacuum device** : polystyrene bead
 - **Magnetic separator device** : magnetic bead

Further Study

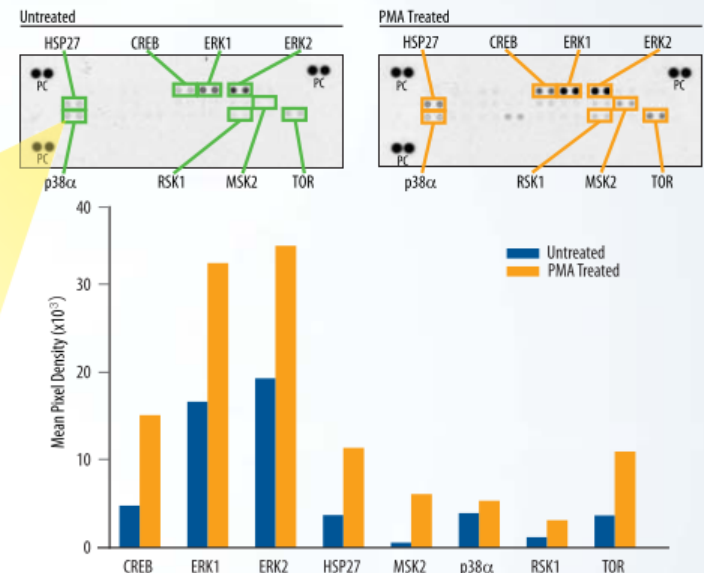
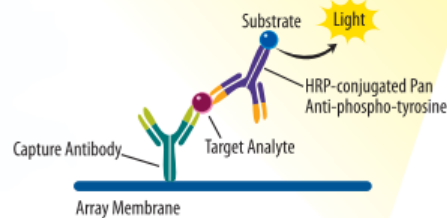
- Antibody array
- ELISA

R&D Antibody array

가장 많은 논문이 선택한 Array는

R&D Antibody Array 입니다!!!

- ✓ 소량의 sample (150 µg)로 100여개 analytes 동시분석
- ✓ 냉장보관 - No activity loss by thawing
- ✓ The most referenced arrays
- ✓ Screening/ Monitoring/ 효능평가
- ✓ 사용 Sample로 Western or ELISA 가능
- ✓ Western blot 장비만으로 OK



ELISA 1. Quantikine ELISA

Quantikine ELISA

- **ELISA의 Gold Standard**
- 필요한 시약 모두 포함 된 **complete kit**
- **정확하고 재현성** 있는 결과 보장
 - Kit 고유의 **control set**로 결과 정확성 확인
 - Sample type에 따라 **고유의 diluent** 제공 하여 matrix effects 최소화
- 1-plate / 6-plate / 50-plate 용량
 - 6-plate / 50-plate 이용 시 경제적인 가격 혜택

ELISA 2. DuoSet ELISA

DuoSet

- Development ELISA
- 800 이상 종류로 **가장 다양한 target 단백질 정량** 가능
- 5-plate / 15-plate 용량으로 **경제적인 실험 가능**
- Kit 구성: capture / detection Ab, standard, SA-HRP
- **추가 필요시약 kit로 편리함과 정확한 결과 제공**
- Sample validation 프로토콜 제공
 - 실험자 자체 validation test 가능

ELISA 3. IC & Cell-Based ELISA

Surveyor / DuoSet IC ELISA

- 세포 내 단백질 정량 ELISA
- Proteome Profiler로 screening 후, confirm assay로 추천
- Surveyor IC vs DuoSet IC
 - Surveyor IC: **Complete kit**, 1 plate
 - DuoSet IC: **Development kit** (DuoSet과 같은 구성), 2 / 5 / 15 plates

Cell based ELISA

- Cell lysis 없이 세포 내 단백질 측정
- 동시에 두 가지 단백질 측정으로 별도 normalization 필요 없음
 - **Total protein kit: Target 단백질 & House keeping 단백질 동시 측정**
 - **Phospho protein kit: Phospho 단백질 & Total 단백질 동시 측정**
- Fluorometer (Luminometer)로 detection

R&D Multi-정량 Tool

Luminex assay

①

**Bead-based
multi-정량 제품**

②

**최대 100개
까지 동시 정량**

③

**Quantikine ELISA
와 높은 correlation**

감사합니다!



이외 관련된 제품에 대한 문의 사항이 있으시면
웅비메디텍 학술팀으로 연락 주세요

 (주)웅비메디텍
www.woongbee.com
Tel. 031-776-3300