

多重標的偵測技術之創新與突破

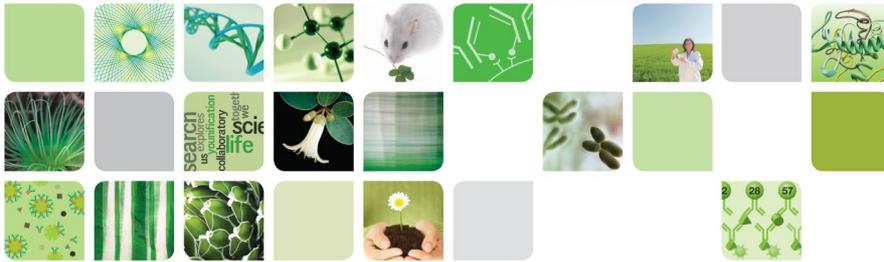
Bio-Plex Multiplex Suspension Array System

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產品應用專員

Bio-Rad Laboratories Taiwan Ltd.

103年4月14日 星期一



Research. Together.



Contents Overview

- Multi-targets Detection (Multiplex)
- Bio-Plex suspension array Technology
- Bio-Plex suspension array system





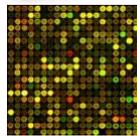
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- Bio-Plex suspension array system

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多重偵測技術平臺



Microarray



Real Time PCR



BioPlex Suspension Array

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Trend Towards Multiplexing

Benefits of Multiplexing

- Increase amount of information from one experiment
- Decrease volume requirements
(mouse samples, tumor biopsies, newborn screening)
- Reveals complex relationships and pathways of biomolecules
- Reduce reagent, expense and labor

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Multiplexing Increases Throughput

How would you like to have 2,160 data points in one 96-well plate?

The Power of the Bio-Plex System

Side-by-Side Comparison: Analyzing 27 Cytokines in 80 Samples

	ELISA	Bio-Plex
Number of cytokines	27	27
Number of samples	80	80
Total data points	2,160	2,160
Number of 96-well plates	27 	1 
Data points per plate	80	2,160
Total time required	>60 hr	3 hr
Sample volume	Serum or plasma, >1 ml* Cell culture supernatant, >1 ml*	Serum or plasma, 12.5 µl Cell culture supernatant, 50 µl
Assay range	Serum or plasma, 2–3,000 pg/ml Cell culture supernatant, 2–3,000 pg/ml	Serum or plasma, ~0.2–3,200 pg/ml Cell culture supernatant, ~2–32,000 pg/ml

* Based on 50 µl/well of sample.

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主要應用領域

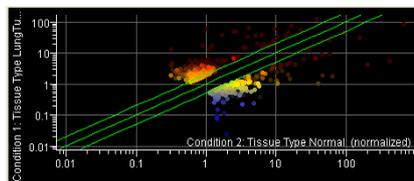
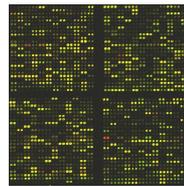
- **基因表現 (Protein Level), 可定量**
 - 藥物作用
 - 腫瘤指標
 - 基因調控
 - 基因治療
 - GMO
- **病原菌偵測 (Nucleic Acid), high sensitivity**
 - 多重病原菌同時偵測
 - 適合大量檢體篩選
 - 定性, 定量 同時完成
 - 藥物治療成效的監控
- **SNP 分型 (Nucleic Acid)**

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Micro Array

- **Micro array: High entrance barrier**
 - **One chip, four sample**
 - Overnight incubation
 - Reproducibility



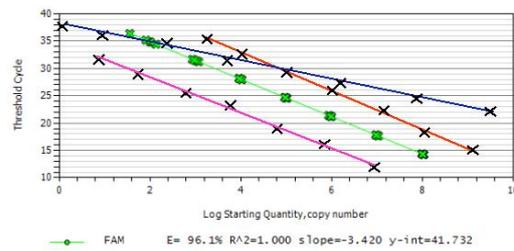
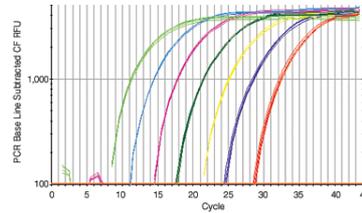
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Real Time PCR

- Real Time PCR: Hot tool
 - **NAT only**
 - Up to five targets only
 - False positive



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- Bio-Plex suspension array system

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What is Bio-Plex?

- Bio-Plex = Suspension Array = Beads Array ≠ Micro Array
- Based on xMAP® technology platform from Luminex Corporation
- Suspension array system designed to quantitate multiple protein or nucleic acid targets in diverse matrices
- Capable of analyzing up to 100 targets in a single sample (µl amounts)



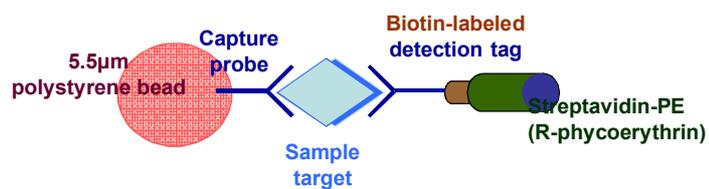
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Suspension Array Technology

xMAP

flexible Multi-Analyte Profiling



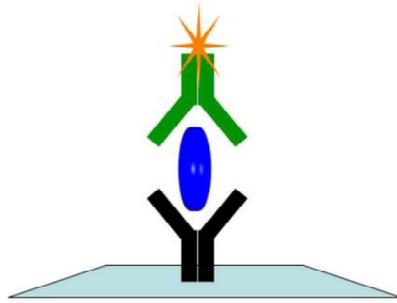
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Suspension Array Technology

Protein Capture Sandwich Assay



ELISA



ELISA on a Bead

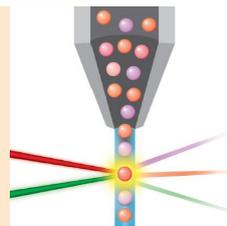
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Suspension Bead Array Technology

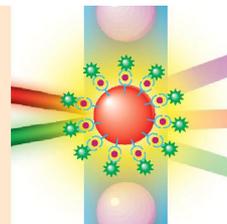
Beads in a fluid stream

Precision fluidics align the beads in single file and pass them through the lasers one at a time.



Detection

A red classification and green reporter laser illuminate individual beads to identify each bead's spectral address and associated reporter signal.



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Suspension Array Technology

- How does the suspension assay work?

- Assay occurs on surface of a **5.5µm polystyrene bead** or **6.5µm magnetic beads**
- Each Bead contains different concentrations of 2 dyes used to classify the bead
 - Dye 1: RED
 - Dye 2: Infared
- Produces 100 uniquely colored beads
- Each bead type consequently has unique spectral address (name)
 - Use one unique color beads for each different assay

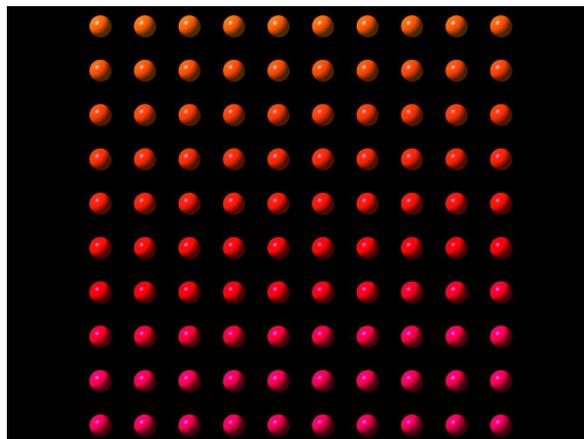
→ **CLASSIFICATION BASED ON BEAD COLOR**

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Suspension Array Technology

100 color codes = 100 simultaneous tests



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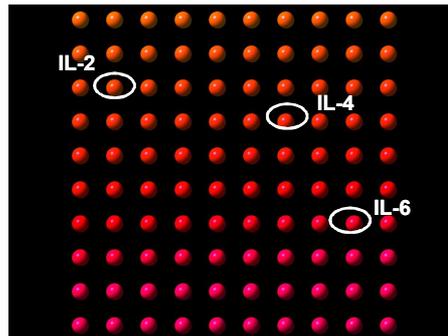


Suspension Array Technology Coupling Beads

- These 100 different colors of beads can be coupled to different protein targets we are interested in

- Purchase beads

- Coupled for singleplex
- Coupled for multiplex
- Uncoupled ready for you to couple any additional target you are interested in



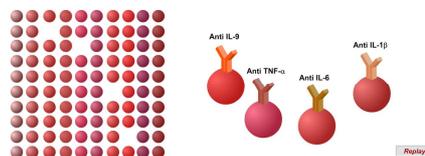
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Suspension Array Technology

- First Step

- Probe is bound to the surface of the bead
- Bio-Plex Assays use an antibody as probe
- Can also design your own assays and couple antigens, ligands etc to unlabeled beads



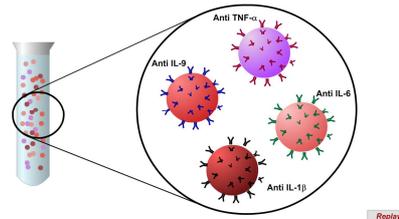
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Suspension Array Technology

- Then mix many beads together
 - Each unique color has a different probe bound to the bead
 - This is multiplexing

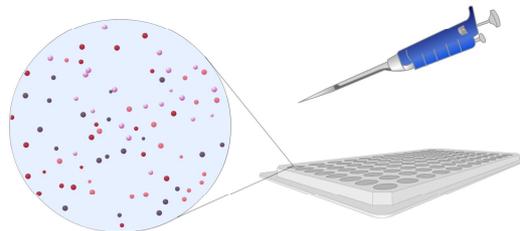


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Suspension Array Technology

- Step Two
 - Mix beads with sample
 - Target in the sample binds to probe bound on bead



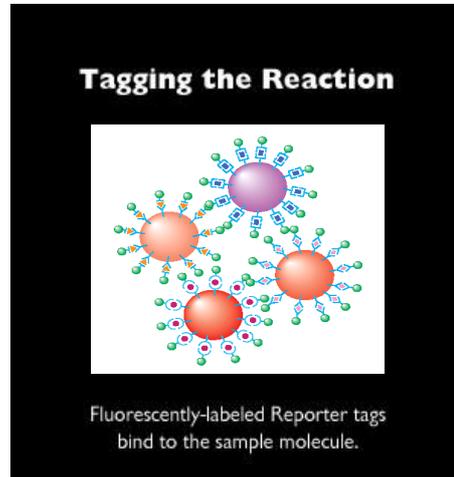
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Suspension Array Technology

- Step Three
 - Add second (detection) probe with fluorescent tag that recognizes different epitope on your target
 - Labeled with phycoerythrin (PE)

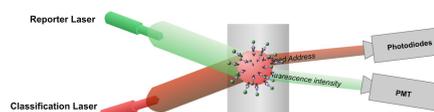


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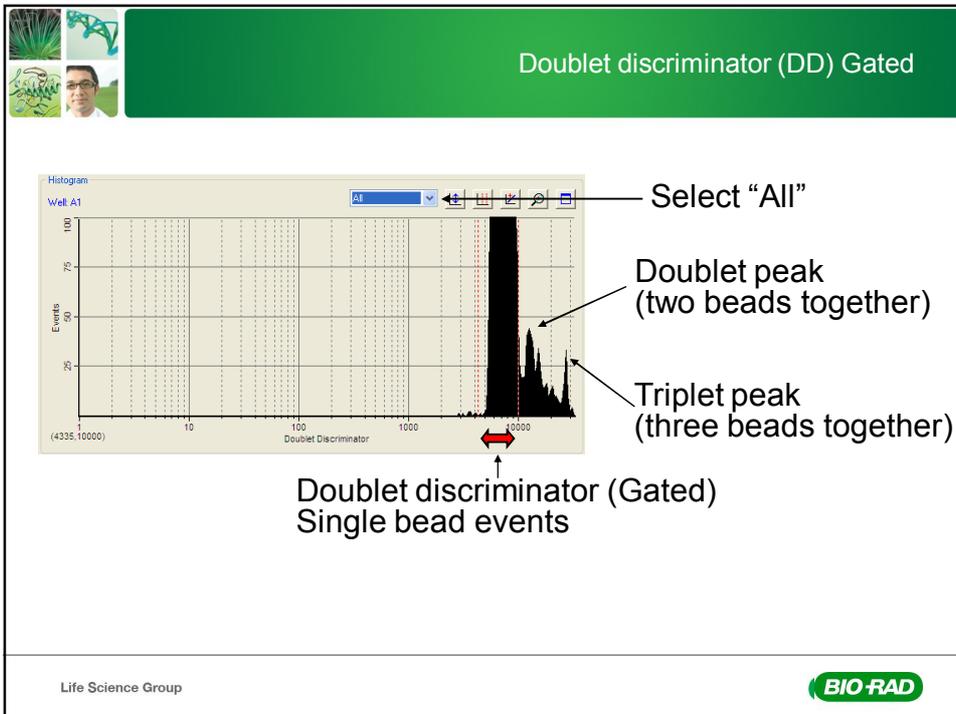
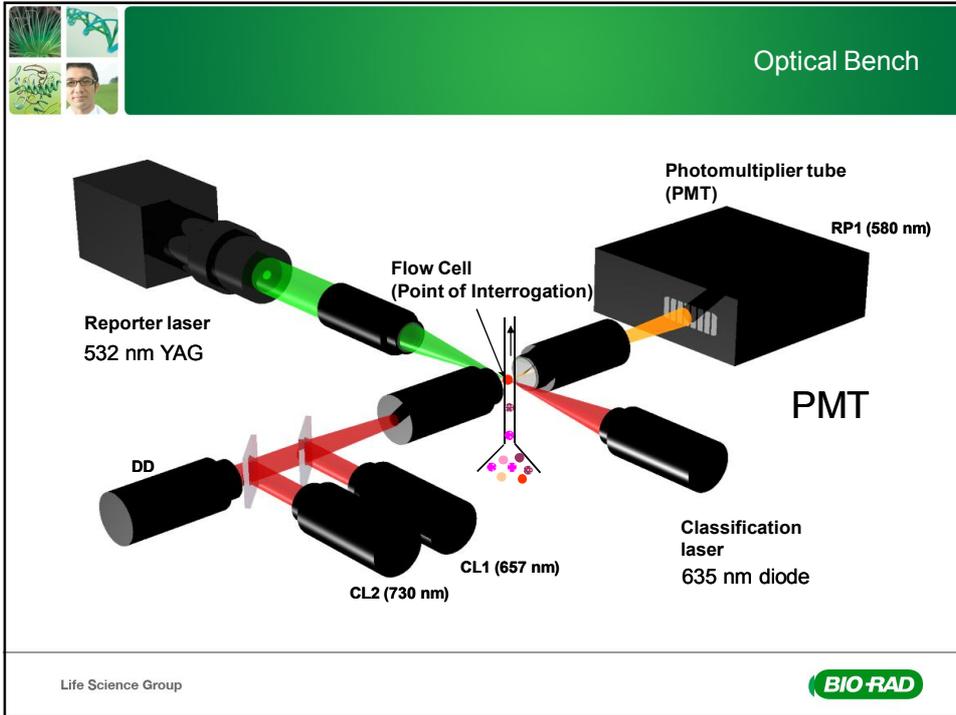
Suspension Array Technology

- Step Four
 - Detect bead color (classification) and fluorescent tag (target signal) using Bio-Plex array reader
 - Beads in suspension
 - Flow in single file in front of lasers
 - Scatter light and emit fluorescence
 - Light is collected, filtered
 - Light signal is converted to digital values for analysis



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Suspension Array Technology

Technology Benefits of Bio-Plex (suspension array system)

Economics

- Labor, reagents, sample

Flexibility

- Many assays commercially available
- User can create custom assays

Accuracy and reproducibility

- CVs are under 10%
- Correlation with ELISA, Western Blot
- Multiplexing allows internally controlled experiments

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Contents Overview

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- Bio-Plex suspension array system

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Bio-Plex System



1. Array reader
2. Microplate platform
3. High-throughput fluidics (HTF)
4. Flat-screen monitor
5. PC- Bio-Plex Manager
6. Validation and calibration kits
7. Singleplex or premixed multiplex assays
8. Maintenance, calibration, and validation (MCV) plate
9. Reagent kits
10. COOH beads
11. Pro Wash Station

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Bio-Plex System

- **Array Reader System:**

- A compact flow analysis unit integrating a dual laser detection system, optics, fluidics, and advanced digital signal processing.

- **Microplate platform:**

- the automated processing of samples from a 96-well microplate.
 - Temperature control (35~60°C)

- **High-throughput fluidics (HTF):**

- Automate the introduction of sheath fluid



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Customer feedback

1. 實驗流程很繁瑣嗎? 與ELISA相比呢? 如何達到high-throughput?
2. 儀器及軟體的操作複雜困難不易學嗎?
3. 機器的平常維護與保養耗時且麻煩嗎?
4. 如何確保每次實驗結果的一致性? 不同日期的數據可以比較嗎?
5. 當實驗數據有問題時, 我如何初步判斷是不是儀器偏差所造成的, 還是其他因素呢?
6. 如果是機器有偏差那該如何處置?



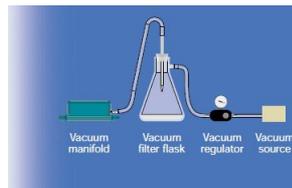
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實驗流程很繁瑣嗎? 與ELISA相比呢? 如何達到high-throughput?

ADD BEADS
 ↓ wash x2
 ADD STANDARDS
 ADD SAMPLES
 ↓
 INCUBATE/SHAKE (30 min)
 ↓ wash x3
 ADD DETECTION ANTIBODIES
 ↓
 INCUBATE/SHAKE (30 min)
 ↓ wash x3
 ADD STREPTAVIDIN-PE
 ↓
 INCUBATE/SHAKE (10 min)
 ↓ wash x3
 RESUSPEND BEADS
 ↓
 READ PLATE



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Bio-Plex[®] Pro Wash Station



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Bio-Plex Pro and Pro II Wash Station

- Two Wash Station Options
 - Bio-Plex Pro Wash Station
 - Magnetic carrier only
 - For Bio-Plex Pro assays

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Bio-Plex[®] Pro
Wash Station

- Bio-Plex Pro II Wash Station
 - Magnetic and Vacuum carrier
 - For all xMAP assays

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Bio-Plex[®] Pro II
Wash Station



Bio-Plex Pro Wash Station Selection Guide

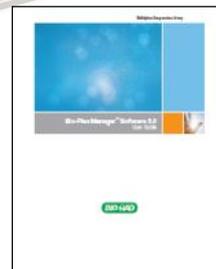
	Bio-Plex Pro Wash Station	Bio-Plex Pro II Wash Station
Bio-Plex assays (polystyrene beads)	—	•
Polystyrene xMAP microspheres	—	•
Bio-Plex Pro assays (magnetic beads)	•	•
Bio-Plex [®] Precision Pro [™] assays (magnetic beads)	•	•
MagPlex microspheres (magnetic beads)	•	•

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儀器及軟體的操作複雜困難不易學嗎？ 機器的平常維護與保養耗時且麻煩嗎？

Bio-Plex Manager

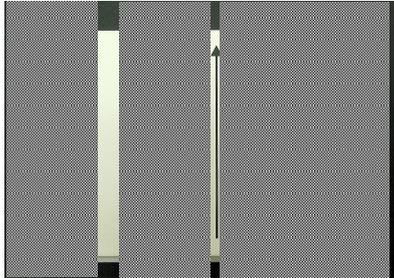


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MCV Plate



MCV plate functions for maintenance, calibration, validation

- 1) Automated calibration and validation protocol,
- 2) System startup and shutdown routines,
- 3) Automated washes between assay plates
- 4) Easy adjustment of sample needle height.

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Bio-Plex Manager Software

Automated Start Up, Calibration, and Shut Down

Bio-Plex Manager

File View Instrument Help

Quick Guide

1. Start up
- Wash Between Plates
- Calibrate

2. New Protocol
- Open Protocol

3. Open Results

4. Shut Down
- Show at startup

Start Up



MCV Plate II

Start up prepares the reader for operation.

1. Empty waste bottle.
2. Refill sheath bottle or verify that sheath cube is not empty.
3. Fill 70% isopropanol and DI water reservoirs.
4. Click Eject then load MCV plate.
5. Press OK to start.

Eject/Retract Plate
Cancel
OK

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Bio-Plex Manager Software

Rapid and Simple Plate

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Bio-Plex Manager Software

Easy to Use Reports

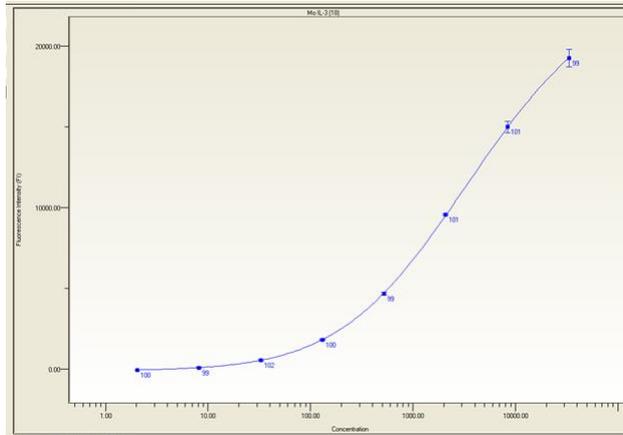
Results	Type	Well	Description	FI	FI - Bkgd	Std Dev	%CV	Obs Conc	Exp Conc	(Obs/Exp) * 100	Conc in Range
1	B	A4,B4,C4		8.7	8.7	0.58	6.66				
2	S1	A5,B5,C5	Standard 1	12577.0	12688.3	436.27	3.39	31900.12	32000.00	100	31900.12
3	S2	D5,E5,F5	Standard 2	10048.2	10039.5	270.25	2.69	7889.98	8000.00	99	7889.98
4	S3	A6,G5,H5	Standard 3	6016.3	6007.7	39.69	0.66	2049.81	2000.00	102	2049.81
5	S4	B6,C6,D6	Standard 4	2803.3	2294.7	81.10	3.52	487.96	500.00	98	487.96
6	S5	B6,F6,G6	Standard 5	705.0	696.3	20.52	2.91	125.89	125.00	101	125.89
7	S6	A7,B7,H6	Standard 6	192.5	183.8	13.08	6.77	32.05	31.25	103	32.05
8	S7	C7,D7,E7	Standard 7	51.3	42.7	1.53	2.98	7.57	7.81	97	7.57
9	S8	F7,G7,H7	Standard 8	19.2	10.5	0.29	1.51	1.98	1.98	101	1.98
10	X1	D4,E4,F4	Sample 1	147.0	138.3	6.08	4.14	24.12			24.12
11	X2	A8,G4,H4	Sample 2	885.0	676.3	19.97	2.92	122.05			122.05
12	X3	B8,C8,D8	Sample 3	2609.0	2600.3	52.44	2.01	571.86			571.86

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Bio-Plex Manager Software

Curve Fitting and Statistical Tools



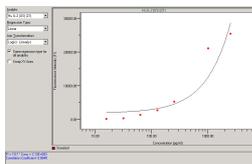
Brenden Scientific Weighted 5 Parameter Logistic (5PL) Regression

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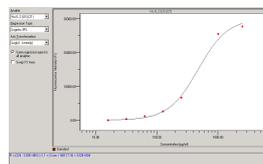
Superior standard curve

- Superior curve fitting
 - *Weighted 5PL algorithm from Brendan Scientific's StatLIA*



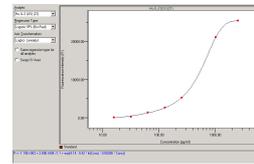
Linear

Obs Conc	Exp Conc	(Obs/Exp) * 100	Conc in Range	Dilution
ORR	15.50	***	***	1.00
ORR	31.25	***	***	1.00
ORR	62.50	***	***	1.00
ORR	125.00	***	***	1.00
ORR	250.00	***	***	1.00
1782.87	1000.00	178	***	1.00
2189.48	2500.00	88	2189.48	1.00



Logistic (4PL)

Obs Conc	Exp Conc	(Obs/Exp) * 100	Conc in Range	Dilution
ORR	15.50	***	***	1.00
ORR	31.25	***	***	1.00
ORR	62.50	***	***	1.00
ORR	125.00	***	***	1.00
ORR	250.00	***	***	1.00
1782.16	1000.00	122	1217.16	1.00
1865.39	2500.00	75	1865.39	1.00



Logistic (5PL)

Obs Conc	Exp Conc	(Obs/Exp) * 100	Conc in Range	Dilution
ORR	15.50	***	***	1.00
ORR	31.25	***	***	1.00
ORR	62.50	***	***	1.00
ORR	125.00	***	***	1.00
ORR	250.00	***	***	1.00
1833	1000.00	117	1833	1.00
2478.66	2500.00	99	2478.66	1.00

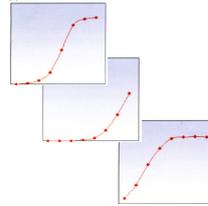
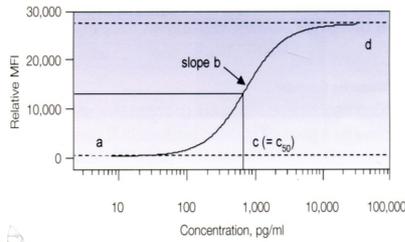
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Superior standard curve

- Superior curve fitting
 - **Weighted 5PL algorithm from Brendan Scientific's StatLIA**



4PL

$$y = d + \frac{a - d}{1 + \left(\frac{x}{c}\right)^b}$$

Where:
 a = estimated response at zero concentration
 b = slope factor
 c = mid-range concentration (C₅₀)
 d = estimated response at infinite concentration

5PL

$$y = d + \frac{a - d}{\left[1 + \left(\frac{x}{c}\right)^b\right]^g}$$

Where:
 a = estimated response at zero concentration
 b = slope factor
 c = mid-range concentration (C₅₀)
 d = estimated response at infinite concentration
 g = asymmetry factor

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Standard curve optimizer

Standard Curve Optimizer Report

Once a data set has been optimized, a report is generated that will indicate any standard curves which should be reviewed by the user.

RESULTS

This column presents the optimization event results, reported as three different outcomes.

- **Successful** – The algorithm was successful. It was able to improve the range of the assay, or no changes were implemented.
- **Not Optimized** – No changes were identified which could improve the range of the assay. It is possible that manual optimization could improve the fit.
- **Check Data** – There were significant challenges associated with this data file, and it is recommended that the data be reviewed.

Review the included comments, in any case. Possible comments are described below.

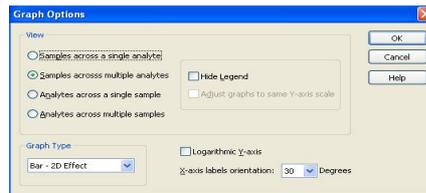
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Graphing

- Incorporated specifically for gene expression assays
- Capable of storing multiple graphs
- Export to Excel exports data, not graph

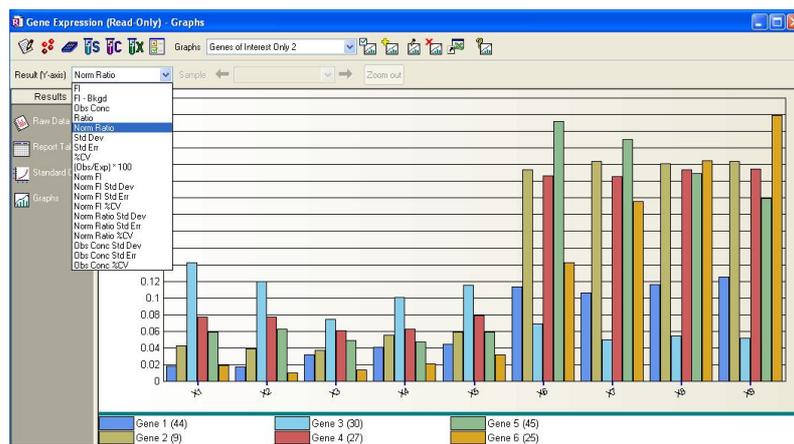


- Four basic types of graphs
 - Multiple options available for y-axis parameter
 - Two options for x-axis
 - Sample
 - Analyte

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Graphing



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Bio-Plex Manager Software

- Reporting Options - Export to Excel / text file.

File Name: D:\BioPlex\MAP Bake-off 2004\R&D rbx\R&D Serum 1 9-1-04.rbx									
Acquisition Date: 01-Sep-2004, 03:42 PM									
Reader Serial Number: LX10003219008									
Plate ID:									
RP1 PMT (Volts): 601.22									
RP1 Target: 3885									
Type Well	Description	hu IL-1 beta (6)	hu IL-2 (17)	hu IL-4 (21)	hu IL-5 (9)	hu IL-6 (32)	hu IL-8 (36)	hu TNF-alpha (77)	
10 B	A3,A4,A5,E6,E7,E8,H6,H7,H8								
11 S1	A1 A2	R&D stds	3431.5	5714.5	2724	9972.5	5770	8470	2748
12 S2	B1 B2	R&D stds	2189.3	2209.5	962.8	4789.3	2907	5469.5	3358.5
13 S3	C1 C2	R&D stds	960	716	271.5	1800.8	1343.3	2800	1238.8
14 S4	D1 D2	R&D stds	403.5	199.5	66.6	549.5	505.3	1265.5	425.5
15 S5	E1 E2	R&D stds	183.3	66	23.3	140.5	176.5	508	155
16 S6	F1 F2	R&D stds	96	23	10.5	36.5	61	194	69.8
17 S7	G1 G2	R&D stds	69.3	10.5	7.5	11	23	72.3	41.5
18 C1	F9 F10	R&D stds	64	10	7	10.5	23	73.3	42
19 C2	G9 G10	R&D stds	94	22	10.3	33.3	61.8	188.3	64.5
20 C3	H9 H10	R&D stds	171.8	38	20	132.3	171	508.5	152
21 C4	A8 A10	R&D stds	384	192.5	63.5	540	493.8	1214.5	410
22 C5	B9 B10	R&D stds	937.5	656.3	272	1897.5	1293	2873.5	1210.5
23 C6	C9 C10	R&D stds	1056.8	1128.5	513.8	2266.3	1451	2721	1737.5
24 C7	D9 D10	R&D stds	4190.5	5725.8	2782.3	9389	5538.8	8277	7108.3
25 C8	B11 B12	R&D stds	62.5	10.3	8.5	10	24	70	40
26 C9	C11 C12	R&D stds	85	21.5	9	32.3	61.8	189.3	68.8
27 C10	D11 D12	R&D stds	177.5	61	21	138	184.5	524.5	153.8
28 C11	E11 E12	R&D stds	401.5	186.8	65	543.8	518	1225.5	425.8
29 C12	F11 F12	R&D stds	957	634.8	274.8	1855	1277.3	2635	1212.5
30 C13	G11 G12	R&D stds	2075	2228.5	1010	5056	2936.5	5056	3347.5
31 C14	H11 H12	R&D stds	4162	5762	2744	10165.5	5331.5	8371	6924.5
32 C15	B3 B4 B5	Bio-Rad stds in serum	9772.2	6304.5	2331	12370.7	1183.7	8932.5	4518.2
33 C16	C3 C4 C5	Bio-Rad stds in serum	2269.5	418.2	111	1918	81.3	2422.5	381
34 C17	D3 D4 D5	Bio-Rad stds in serum	156.3	70.3	12.8	322.7	27.5	690.5	118.8
35 C18	E3 E4 E5	Bio-Rad stds in serum	91.7	6.7	6	10.2	6.3	55.5	31.7

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如何確保每次實驗結果的一致性? 不同日期的數據可以比較嗎?

- Bio-Plex Calibration Kit (every day)
- Ensures optimal reliability and reproducibility

Calibrate

Enter user name: GLOBAL\pocoka Last calibration Date: 10-Oct-2007, 09:22 AM Temp (Celsius): 24.39

Select Calibration type:
 CAL1 & CAL2 CAL1 Only CAL2 Only

Select control numbers:

CAL1 Control Number:

CAL2 Control Number:

DD Target: CL1 Target: CL2 Target:

Low RPI Target:

Expiration Date: 18-Mar-2008 Expiration Date: 18-Mar-2008

Note: The displayed target values should match the targets on the CAL1 & CAL2 bottles.



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Calibration Log

• Record of daily calibrations and detector voltages

Calibration Log

Date/Time	User	CONTROL NUMBER		DETECTOR VOLTAGE				Serial #
		CAL1	CAL2	DD	RP1	CL1	CL2	
Jan-31-01 11:04	sw	CAL1/22222	CAL2/22222	83.01	772.16	80.58	62.58	LX10000027001
Jan-30-01 13:15	chloe	CAL1/22222	CAL2/22222	82.26	767.77	80.45	61.21	LX10000027001
Jan-30-01 12:38	chloe	CAL1/22222	CAL2/22222	60.47	701.59	107.48	85.12	LX10099323012
Jan-30-01 12:07	SW	A1388	A1388	60.47	570.45	106.86	83.26	LX10099323012
Jan-30-01 10:26	Steve Warrick		A1388	NA	570.45	NA	NA	LX10099323012
Jan-30-01 09:50	Steve Warrick	A1388		60.22	NA	106.61	82.82	LX10099323012
Jan-16-01 12:19	Steve Warrick	A1388	A1388	109.35	569.72	116.70	89.98	LX10099323012
Jan-11-01 12:52	Steve Warrick	A1388	CAL2/A1399	109.60	567.28	108.79	86.93	LX10099323012
Jan-02-01 15:08	Steve Warrick	A1388	A1388	110.78	575.34	109.72	88.30	LX10099323012
Nov-13-00 16:05	sri	Test		532.00	NA	1689.00	1293.00	LX10099323005

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當實驗數據有問題時，我如何初步判斷是不是儀器偏差所造成的，還是其他因素呢？

- Verify that Bio-Plex system is performing according to specifications
- Used to troubleshoot instrument vs. assay problems
- Types of validation in Bio-Plex validation kit:
 - Optical validation (are lasers aligned)
 - Reporter Validation (linearity, sensitivity)
 - Classify validation (calls right beads right “name”)
 - Validation of fluidics integrity (bead carryover)

Validation Specifications

Optics	DD Median: 4774 - 6593	CL1 CV%: 3.00 - 7.00
	CL1 Median: 3383 - 4135	CL2 CV%: 4.00 - 6.00
	CL2 Median: 3520 - 4302	RP1 CV%: 5.00 - 10.00
	RP1 Median: 15205 - 18683	
Fluidics	Carryover: < α = 3.5%	
Reporter	Dynamic Range: 4.15 - 4.28	Accuracy: > 90.00%
	Sensitivity: < 200 MESF	Linearity: > 0.995
	Slope: 0.0593 - 0.0799	
Classify	Bead 34: > 80.0%	DD Efficiency: > α = 75.0%
	Bead 36: > 80.0%	
	Bead 54: > 80.0%	
	Bead 73: > 80.0%	
	Bead 77: > 80.0%	

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System Validation History - IQ/OQ

On-board IQ/OQ records

Fluidics Validation Results

Date/Time	User	Kit Control #	Carry
13-Jan-03, 12:20 PM	Dano	90610	
13-Jan-03, 10:21 AM	Dano	90610	
13-Jan-03, 10:07 AM	Dano	90610	
10-Jan-03, 04:50 PM	Dano	90610	
10-Jan-03, 04:10 PM	Dano	90610	
09-Jan-03, 11:42 AM	Dano	90610	
09-Jan-03, 11:16 AM	Dano	90610	
09-Jan-03, 10:49 AM	Dano	90610	
09-Jan-03, 10:25 AM	Dano	90610	

Reporter Validation Results

Date/Time	User	Kit Control #	Dynamic Range	Calculated Values				Blank	Raw Val	
				Linearity	Slope	Accuracy	Sensitivity		1	2
13-Jan-03, 12:20 PM	Dano	90610	4.19	1.000	0.0664	97.53%	120	8	19	162
13-Jan-03, 10:21 AM	Dano	90610	4.24	1.000	0.0736	96.99%	122	8	24	216
13-Jan-03, 10:07 AM	Dano	90610	4.20	0.999	0.0667	91.53%	145	10	25	224
10-Jan-03, 04:50 PM	Dano	90610	4.21	0.999	0.0696	92.31%	244	17	26	214
10-Jan-03, 04:10 PM	Dano	90610	4.21	0.999	0.0688	92.53%	320	22	28	205
09-Jan-03, 11:42 AM	Dano	90610	4.21	0.999	0.0686	87.47%	321	22	35	208
09-Jan-03, 11:16 AM	Dano	90610	4.21	0.999	0.0689	96.35%	129	8	23	215
09-Jan-03, 10:49 AM	Dano	90610	4.21	0.999	0.0660	92.41%	151	10	24	204
09-Jan-03, 10:25 AM	Dano	90610	4.21	0.999	0.0623	96.94%	112	7	19	187

Optics Validation Results

Date/Time	User	Kit Control #	DD	CL1	CL2	RP1	CV%	CL1	CL2	RP1
13-Jan-03, 12:20 PM	Dano	90610	5799	3732	3892	17322	5.89	6.70	8.37	
13-Jan-03, 10:21 AM	Dano	90610	5720	3444	4489	17395	5.85	5.84	8.44	
13-Jan-03, 10:07 AM	Dano	90610	5995	3594	4026	17309	6.15	6.94	9.16	
10-Jan-03, 04:50 PM	Dano	90610	5938	3822	3949	17243	6.45	6.94	9.60	
10-Jan-03, 04:10 PM	Dano	90610	5821	3736	3895	17614	6.82	7.92	9.09	
10-Jan-03, 04:02 PM	zz	90610	5758	3631	3655	16926	6.83	7.70	8.95	
10-Jan-03, 03:59 PM	zz	90610	5820	3989	3959	16960	6.54	8.04	9.97	
10-Jan-03, 03:58 PM	zz	90610	5774	3682	3829	17143	6.80	8.77	9.45	
10-Jan-03, 03:50 PM	zz	90610	5861	3702	3916	16730	6.36	7.58	10.48	

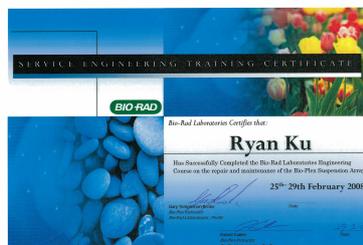
Classify Validation Results

Date/Time	User	Kit Control #	Classify Bead				DD Efficiency	Result	Serial #	Reader Inf	
			34	54	73	77					
13-Jan-03, 12:20 PM	Dano	90610	98.9%	98.9%	96.2%	97.0%	97.2%	91.2%	Completed	1c10099892008	8
13-Jan-03, 10:31 AM	z	90610	1.6%	0.0%	7.9%	9.5%	0.4%	91.0%	Completed	1c10099892008	8
13-Jan-03, 10:21 AM	Dano	90610	3.1%	0.0%	11.1%	9.2%	1.7%	91.6%	Completed	1c10099892008	8
13-Jan-03, 10:07 AM	Dano	90610	6.8%	0.0%	7.1%	13.7%	0.6%	91.5%	Completed	1c10099892008	8
10-Jan-03, 04:50 PM	Dano	90610	98.2%	94.3%	96.9%	97.0%	97.4%	90.7%	Completed	1c10099892008	8
10-Jan-03, 04:10 PM	Dano	90610	97.7%	94.1%	96.9%	97.2%	96.3%	90.3%	Completed	1c10099892008	8
09-Jan-03, 11:42 AM	Dano	90610	97.6%	96.7%	95.6%	96.6%	95.7%	91.1%	Completed	1c10099892008	7
09-Jan-03, 11:16 AM	Dano	90610	98.2%	98.9%	95.4%	97.2%	96.8%	91.2%	Completed	1c10099892008	7
09-Jan-03, 10:49 AM	Dano	90610	42.7%	40.8%	93.0%	91.7%	95.7%	99.8%	Completed	1c10099892008	7

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如果是機器有偏差那該如何處置?

- Sales:
 - 18, Master degree, Level 1 trouble shooting (正茂生物科技)
- FAS:
 - 3, Master degree, Training, advance trouble shooting
- FSE:
 - 4, > 3 years certified engineers



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Bio-Plex Feature and Benefit

Feature	Benefit
多重標的物偵測-最高可以同時分析100種不同的分析物。	<ol style="list-style-type: none"> 1. 可以節省時間、成本。 2. 可以從單一檢體得到大量的資訊，可以節省珍貴的檢體用量。 3. 可以得到全面性的實驗結果，可以知道分析物彼此的關連性。
多功能平台，可同時適用於蛋白質和核酸方面的分析。	可以進行不同方面的實驗，提供使用者彈性的實驗選擇。
完整的校正 (Calibration) 及確效 (Validation) 試劑組合，可確保儀器的效能。	<ol style="list-style-type: none"> 1. 可以瞭解儀器狀況，確保實驗結果的準確性。 2. 可以符合 IQ/OQ 規範，符合實驗室認證系統。
可經由校正過程調整 PMT 電壓高低。	可以設定儀器的靈敏度，可以偵測較低濃度的反應物。
方便容易上手，同時具有控制儀器及分析資料整合性的軟體。	容易操作、維護機器，並且可以自動化分析實驗結果。
利用加性的 SPL (StatLIA Weighted SPL) 方式計算標準曲線。	可以得到更準確的實驗結果。
具有多功能的 MCV plate III，可供例行維護、校正及調整使用。	<ol style="list-style-type: none"> 1. 可以輕易的調整 needle 高度，便於使用不同種類的耗材。 2. 容易完成例行性的維護保養工作。 3. 容易進行儀器的校正及確效的工作。
具有實驗完成後重新分析資料的功能(重新計算 DD Gates)。	可以調整不同的設定值，得到更精確的資料，不需重新進行實驗。
可以支援 Magnetic Beads。	應用更廣，可以進行自動化分析的步驟。
提供全系列的分析試劑組合：Cytokine, Phosphoprotein Assay。	可滿足不同的實驗需求，得到更精確的實驗結果。
提供 amine coupling kits 及 COOH Beads。	可供使用者自行設計分析項目，符合更廣泛的實驗需求。
由 Bio-Rad 提供全方位的支援和服務。	任何與 Bio-Plex 相關的問題都可以由單一窗口為使用者解決。

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Department of Health and Human Services
Centers for Disease Control and Prevention

Major clinical laboratories e.g. American Centers for Disease Control (CDC) exploit the power of **Bio-Plex** for research and clinical screening in their 100 response Laboratories

Applications include;

- Syphilis screening (cytokine)
- Dengue virus types 1-4 detection
- West Nile Virus detection
- *Legionella*
- Varicella Zoster Virus (VZV) Ab Assay
- Tuberculosis "spoligotyping" – DNA-based screening
- Bioterrorism agents
- Genaco Acute Respiratory Panel
- Food borne pathogen detection

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Our Partners in Taiwan

- 行政院衛生署疾病管制局 x7
- 中央研究院生醫所 x1
- 國家衛生研究院精神醫學組 x1
- 核能研究所同位素研究組 x1
- 淡水家畜試驗中心豬瘟組 x1
- 國防醫學院麻醉學科 x1
- 長庚醫院檢驗中心 x1
- 長庚大學蛋白質體中心 x1
- 台大醫學院藥理所 x1
- 台灣大學植病系 x1
- 國泰醫院汐止分院醫學研究中心 x1
- 和信醫院治癌中心 x1
- 中山大學生科院 x1
- 彰化基督教醫院檢驗科 x1
- 冷泉港生物科技公司 x1
- 長庚高雄分院轉譯中心 x1
- 國防醫學院預防醫學研究所 x1
- 國防醫學院張立乾教官實驗室 x1
- 正茂生物科技公司 x1
- 亞東醫院 x1

Total : 26

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The Bio-Plex Solution



Software
 ✓ Instrument Control
 ✓ Data Analysis



Hardware



Beads & Assays
 ✓ Cytokines
 ✓ Phosphoproteins
 ✓ Amine Coupling Kit
 ✓ Calibration/Validation

Service & Support

www.bio-rad.com/bioplex

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Thank you!

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CAT. NO.	price	
M50000007A: PRO HU 8-PLEX	90100	117
M50-00031YV: PRO HU 17-PLEX	138100	85
M50-0KCAF0Y: PRO HU 27-PLEX	249100	96
M60-009RDPD:PRO MO 23-PLEX	183300	83
一盤 coating anti body 的ELSAT plate	11500	120

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