

Quantibody[®] Human Cytokine Array 8

--Quantitative measurement of 40 human cytokines

Patent Pending Technology

User Manual (Version Dec 2013)

Cat # QAH-CYT-8



RayBiotech, Inc.

**We Provide You With Excellent
Protein Array Systems and Service**

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Cytokine Detected (40)	ANGPTL3, β IG-H3, CA9, Cathepsin B, CD23, CHI3L1, CTLA4, Dkk-4, DPPIV, EDA-A2, Epo R, FGF-6, FGF-9, Gas1, GITR, IGFBP-5, IL-1F5, IL-1F6, IL-1F7, IL-1F8, IL-1F9, IL-1F10, IL-1R5, IL-17C, IL-18, IL-20, IL-34, IL-5 R α , IL-10 R α , Layilin, Leptin R, Marapsin, Mer, MMP-7, P-Cadherin, Prostatin, PSMA, SIGIRR, TGF β RIII, Tissue Factor, TWEAK
Format	One standard glass slide is spotted with 16 wells of identical cytokine antibody arrays. Each antibody is arrayed in quadruplicate.
Detection Method	Fluorescence with laser scanner: Cy3 equivalent dye
Sample Volume	50 – 100 μ l per array
Reproducibility	CV <20%
Assay duration	6 hrs

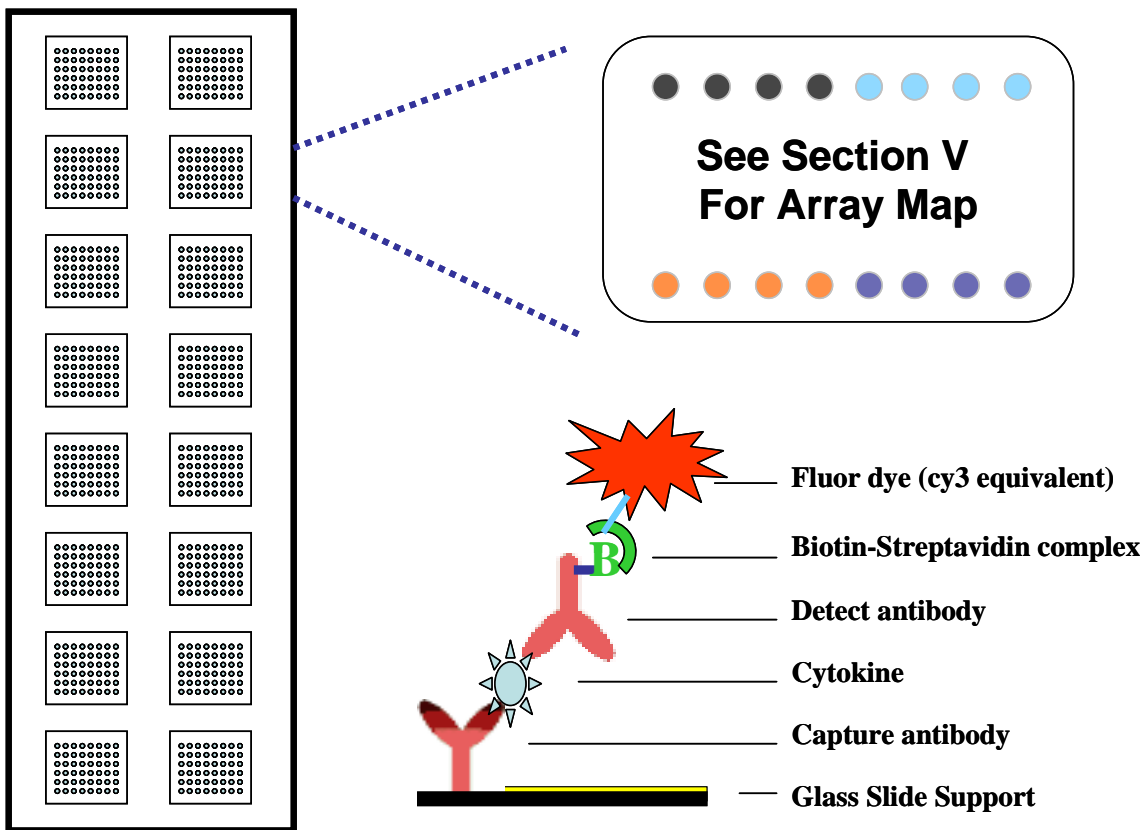


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I. Introduction

Cytokines play an important role in innate immunity, apoptosis, angiogenesis, cell growth and differentiation. They are involved in interactions between different cell types, cellular responses to environmental conditions, and maintenance of homeostasis. In addition, cytokines are also involved in most disease processes, including cancer and cardiac diseases.

The traditional method for cytokine detection and quantification is through the use of an enzyme-linked immunosorbent array (ELISA). In this method, target protein is first immobilized to a solid support. The immobilized protein is then complexed with an antibody that is linked to an enzyme. Detection of the enzyme-complex can then be visualized through the use of a substrate that produces a detectable signal. While the traditional method works well for a single protein, the overall procedure is time consuming and requires a lot of sample. With little sample to work with, conservation of precious small quantities becomes a risky task. Take the advantage of advancement in microarray technology over the last decade; more and more choices are available to the scientist today. A long-standing leader in the field, Raybiotech, has pioneered the development of cytokine antibody arrays, which has now been widely applied in the research community with hundreds of peer reviewed publications such as in *Cell* and *Nature*.

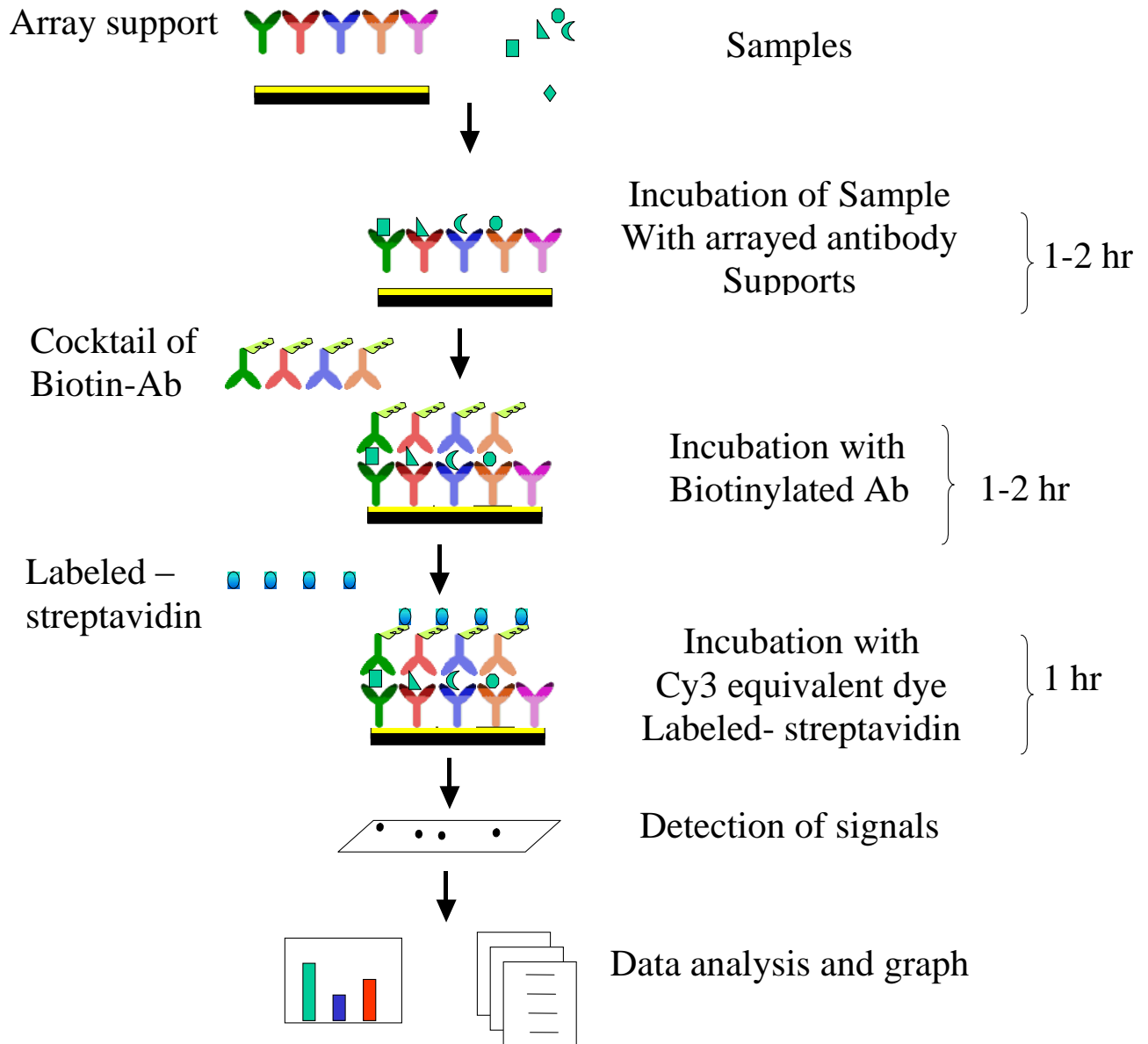
Quantibody[®] array, our quantitative array platform, uses the multiplexed sandwich ELISA-based technology and enables researchers to accurately determine the concentration of multiple cytokines simultaneously. It combines the advantages of the high detection sensitivity / specificity of ELISA and the high throughput of the arrays. Like a traditional sandwich-based ELISA, it uses a pair of cytokine specific antibodies for detection. A capture antibody is first bound to the glass surface. After incubation with the sample, the target cytokine is trapped on the solid surface. A second biotin-labeled detection antibody is then added, which can recognize a different isotope of the target cytokine. The cytokine-antibody-biotin complex can then be visualized through the addition of the streptavidin-labeled Cy3 equivalent dye using a laser scanner. Unlike the traditional ELISA, Quantibody products use array format. By arraying multiple cytokine

specific capture antibodies onto a glass support, multiplex detection of cytokines in one experiment is made possible.

In detail, one standard glass slide is spotted with 16 wells of identical cytokine antibody arrays. Each antibody, together with the positive controls is arrayed in quadruplicate. The slide comes with a 16-well removable gasket which allows for the process of 16 samples in one slide. Four slide chips can be nested into a tray, which matches a standard microplate and allows for automated robotic high throughput process of 64 arrays simultaneously. For cytokine quantification, the array specific cytokine standards, whose concentration has been predetermined, are provided to generate a standard curve for each cytokine. In a real experiment, standard cytokines and samples will be assayed in each array simultaneously through a sandwich ELISA procedure. By comparing signals from unknown samples to the standard curve, the cytokine concentration in the samples will be determined.

Quantibody[®] array kits have been confirmed to have similar detection sensitivity as traditional ELISA. Our current high density Quantibody kits allow scientists to quantitatively determine the concentration of 400 human, 200 mouse, or 100 rat cytokines in a single experiment. This is not only one of the most efficient products on the market for cytokine quantification, but makes it more affordable for quantification of large number of proteins. Simultaneous detection of multiple cytokines undoubtedly provides a powerful tool for drug and biomarker discovery.

How It Works



II. Materials Provided

Upon receipt, all components of the Quantibody® Array kit should be stored at -20°C. At -20°C the kit will retain complete activity for up to 6 months. Once thawed, the glass chip, cytokine standard mix, detection antibody cocktail and Cy3 equivalent dye-conjugated Streptavidin should be kept at -20°C and all other components may be stored at 4°C. The entire kit should be used within 6 months of purchase.

Components

Item	Description	1-Slide kit	2-Slide kit
1	Quantibody® Array Glass Chip	1	2
2	Sample Diluent	1	1
3	20X Wash Buffer I	2	3
4	20X Wash Buffer II	1	1
5	Lyophilized cytokine standard mix *	1	1
6	Detection antibody cocktail	1	2
7	Cy3 equivalent dye-conjugated Streptavidin	1	2
8	Slide Washer/Dryer	1	1
9	Adhesive device sealer	5	10
10	Manual	1	1

* See Section VI for detailed cytokine concentrations after reconstitution.

Additional Materials Required

- Orbital shaker
- Laser scanner for fluorescence detection
- Aluminum foil
- Distilled water
- 1.5ml Polypropylene microcentrifuge tubes

III. General Considerations

A. Preparation of Samples

- Use serum-free conditioned media if possible.
- If serum-containing conditioned media is required, it is highly recommended that complete medium be used as a control since many types of sera contains cytokines.
- We recommend the following parameters for your samples:
50 to 100 µl of original or diluted serum, plasma, cell culture media, or other body fluid, or 50-500 µg/ml of protein for cell and tissue lysates.

If you experience high background or the readings exceed the detection range, further dilution of your sample is recommended.

B. Handling glass chips

- Do not touch the surface of the slides, as the microarray slides are very sensitive. Hold the slides by the edges only.
- Handle all buffers and slides with latex free gloves.
- Handle glass chip in clean environment.
- Because there is no barcode on the slide, transcribe the slide serial number from the slide bag to the back of the slide with a permanent marker before discarding the slide bag. Once the slide is disassembled, you might not have enough info to distinguish one slide from the other.

C. Incubation

- Completely cover array area with sample or buffer during incubation.
- Avoid foaming during incubation steps.
- Perform all incubation and wash steps under gentle rotation.
- Cover the incubation chamber with adhesive film during incubation, particularly when incubation is more than 2 hours or <70 µl of sample or reagent is used.
- Several incubation steps such as step 6 (blocking), step 7 (sample incubation), step 10 (detection antibody incubation), or step 13 (Cy3 equivalent dye-streptavidin incubation) may be done overnight at 4⁰C. Please make sure to cover the incubation chamber tightly to prevent evaporation.

IV. Protocol

A. Completely air dry the glass chip

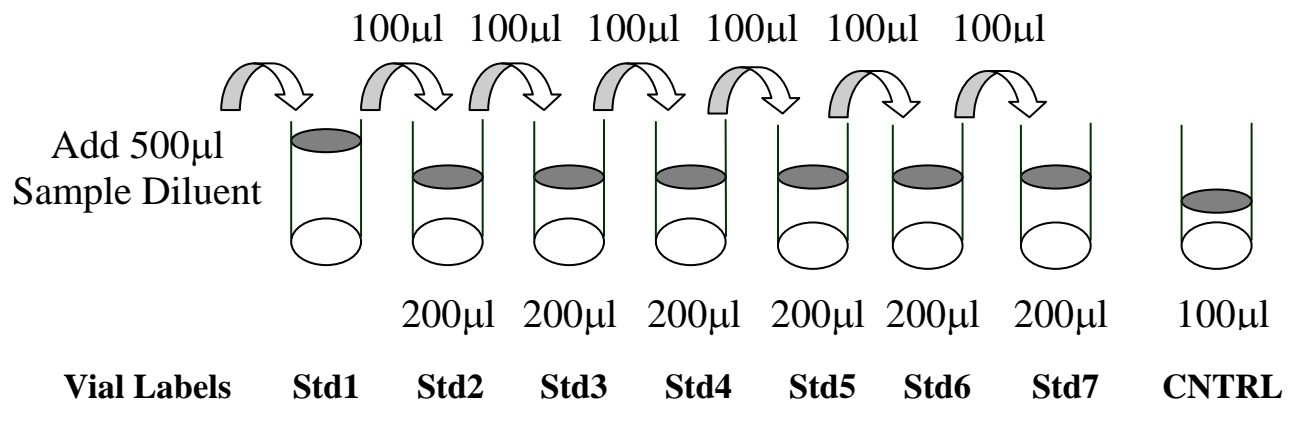
1. Take out the glass chip from the box, and let it equilibrate to room temperature inside the sealed plastic bag for 20-30 minutes. Remove slide from the plastic bag; peel off the cover film, and let it air dry at room temperature for another 1-2 hours.

Note: Incomplete drying of slides before use may cause the formation of “comet tails”.

B. Prepare Cytokine Standard Dilutions

Note: There is only one vial of standard provided in the two-slide kit, which is enough for making two standard curves. Reconstitute the lyophilized standard within one hour of usage. If you must use the standard for two different days, store only the Std1 dilution at -80°C .

Prepare serial dilution of cytokine standards



2. Reconstitute the Cytokine Standard Mix (lyophilized) by adding 500 µl Sample Diluent to the tube. For best recovery, always quick-spin vial prior to opening. Dissolve the powder thoroughly by a gentle mix. Labeled the tube as Std1.

3. Label 6 clean microcentrifuge tubes as Std2 to Std7. Add 200µl Sample Diluent to each of the tubes.
4. Pipette 100µl Std1 into tube Std2 and mix gently. Perform 5 more serial dilutions by adding 100ul Std2 to tube Std3 and so on.
5. Add 100µl Sample Diluent to another tube labeled as CNTRL. Do not add standard cytokines or samples to the CNTRL tube, which will be used as negative control. For best results, include a set of standards in each slide.

Note: Since the starting concentration of each cytokine is different, the serial concentrations from Std1 to Std7 for each cytokine are varied which can be found in section VI.

C. Blocking and Incubation

6. Add 100µl Sample Diluent into each well and incubate at room temperature for 30 min to block slides.
7. Decant buffer from each well. Add 100µl standard cytokines or samples to each well. Incubate arrays at room temperature for 1-2 hour. (Longer incubation time is preferable for higher signals)

Note: We recommend using 50 to 100 µl of original or diluted serum, plasma, conditioned media, or other body fluid, or 50-500 µg/ml of protein for cell and tissue lysates. Cover the incubation chamber with adhesive film during incubation if less than 70 ul of sample or reagent is used.

Note: This step may be done overnight at 4⁰C for best results.

8. Wash:
 - Decant the samples from each well, and wash 5 times (5 min each) with 150 µl of 1x Wash Buffer I at room temperature with gentle shaking. Completely remove wash buffer in each wash step. Dilute 20x Wash Buffer I with H₂O.

- (Optional for Cell and Tissue Lysates) Put the glass chip with frame into a box with 1x Wash Buffer I (cover the whole glass slide and frame with Wash Buffer I), and wash at room temperature with gentle shaking for 20 min.
- Decant the 1x Wash Buffer I from each well, wash 2 times (5 min each) with 150 µl of 1x Wash Buffer II at room temperature with gentle shaking. Completely remove wash buffer in each wash step. Dilute 20x Wash Buffer II with H₂O.

Note: Incomplete removal of the wash buffer in each wash step may cause “dark spots”. (Background signal is higher than that of the spot.)

D. Incubation with detection antibody cocktail and wash.

9. Reconstitute the detection antibody by adding 1.4 ml of Sample Diluent to the tube. Spin briefly.
10. Add 80 µl of the detection antibody cocktail to each well. Incubate at room temperature for 1-2 hour. (*Longer incubation time is preferable for higher signals and backgrounds*)
11. Decant the samples from each well, and wash 5 times with 150 µl of 1x Wash Buffer I and then 2 times with 150 µl of 1x Wash Buffer II at room temperature with gentle shaking. Completely remove wash buffer in each wash step.

E. Incubation with Cy3 equivalent dye -Streptavidin and wash

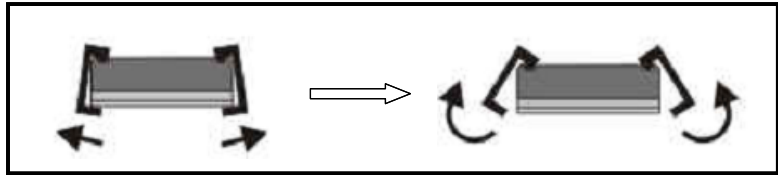
12. After briefly spinning down, add 1.4 ml of Sample Diluent to Cy3 equivalent dye-conjugated streptavidin tube. Mix gently.
13. Add 80 µl of Cy3 equivalent dye-conjugated streptavidin to each well. Cover the device with aluminum foil to avoid exposure to light or incubate in dark room. Incubate at room temperature for 1 hour.

14. Decant the samples from each well, and wash 5 times with 150 μ l of 1x Wash Buffer I at room temperature with gentle shaking. Completely remove wash buffer in each wash step.

F. Fluorescence Detection

15. Disassemble the device by pushing clips outward from the slide side. Carefully remove the slide from the gasket.

(Be careful not to touch the surface of the array side)

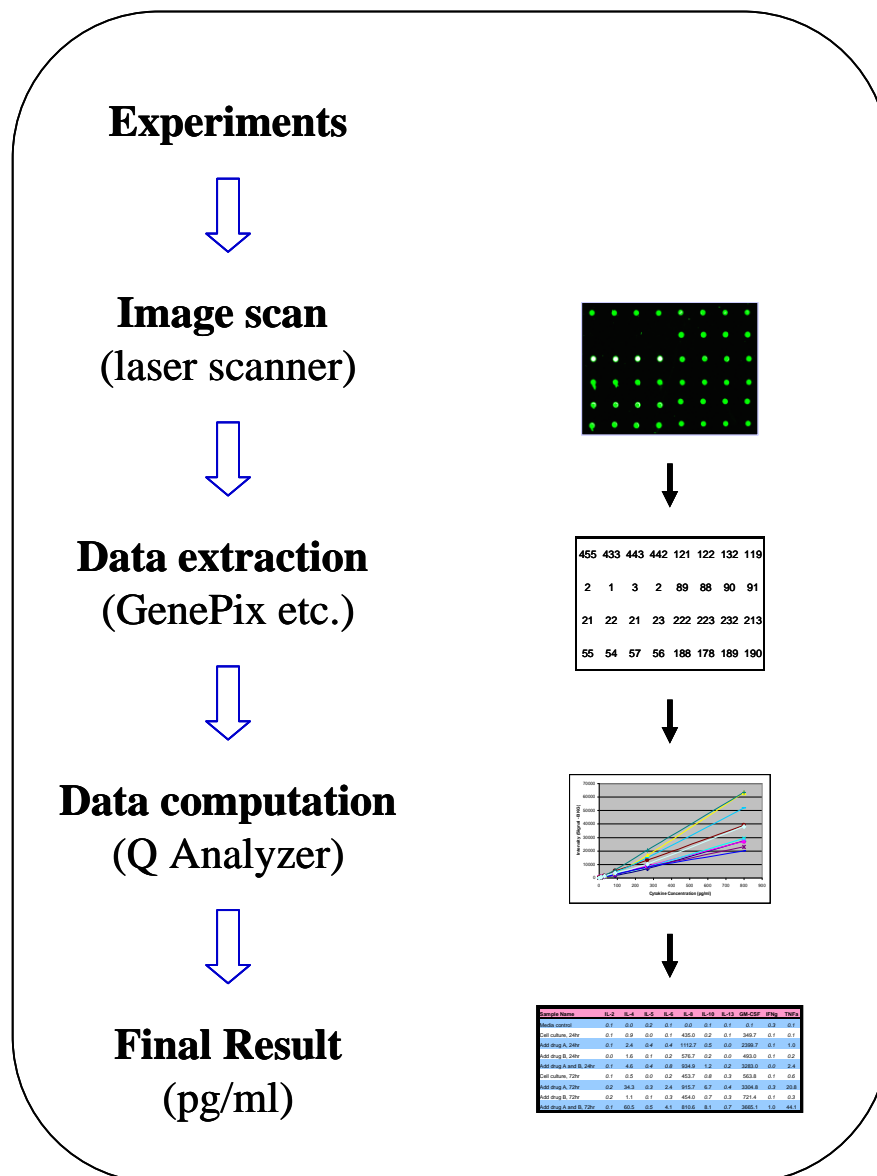


16. Place the slide in the slide Washer/Dryer (a 4-slide holder/centrifuge tube), add enough 1x Wash Buffer I (about 30 ml) to cover the whole slide, and then gently shake at room temperature for 15 minutes. Decant Wash Buffer I. Wash with 1x Wash Buffer II (about 30 ml) with gentle, and gently shake at room temperature for 5 minutes.
17. Remove water droplets completely by one of the following ways:
- Put the glass chip into the Slide Washer/Dryer, and dry the glass chip by centrifuge at 1,000 rpm for 3 minutes without cap.
 - Or, dry the glass chip by a compressed N₂ stream.
 - Or gently apply suction with a pipette to remove water droplets. Do not touch the array, only the sides.
18. Imaging: The signals can be visualized through use of a laser scanner equipped with a Cy3 wavelength such as Axon GenePix. Make sure that the signal from the well containing the highest standard concentration (Std1) receives the highest possible reading, yet remains unsaturated.

Note: In case the signal intensity for different cytokine varies greatly in the same array, we recommend using multiple scans, with a higher PMT for low signal cytokines, and a low PMT for high signal cytokines.

G. Data Analysis

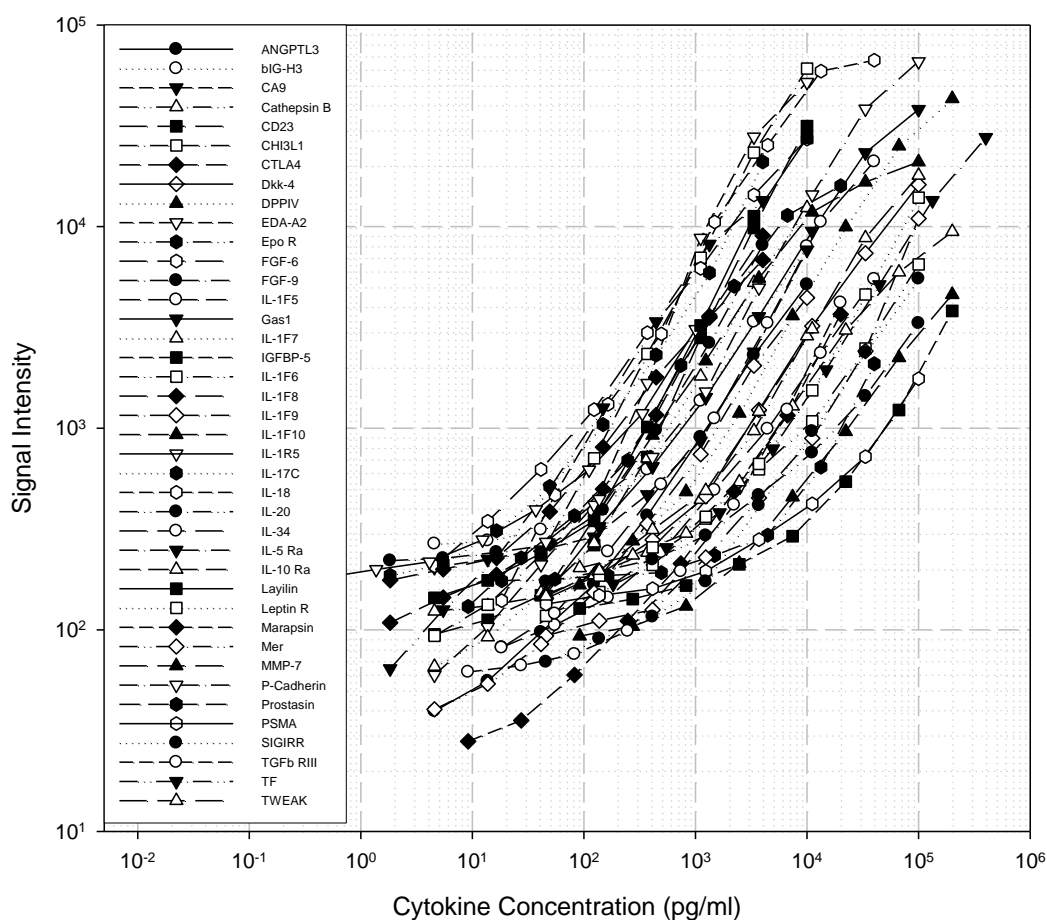
19. Data extraction can be done with most of the microarray analysis software (GenePix, ScanArray Express, ArrayVision, or MicroVigene). For quantitative data analysis, our Quantibody® Q-Analyzer software is available. It gives visual output as well as digital values. More information can be found in section VIII.



V. Cytokine Array Map & Standard Curves

POS1	POS2	ANGPTL3
β IG-H3	CA9	Cathepsin B
CD23	CHI3L1	CTLA4
Dkk-4	DPPIV	EDA-A2
Epo R	FGF-6	FGF-9
Gas1	IGFBP-5	IL-1F5
IL-1F6	IL-1F7	IL-1F8
IL-1F9	IL-1F10	IL-1R5
IL-17C	IL-18	IL-20
IL-34	IL-5 R α	IL-10 R α
Layilin	Leptin R	Marapsin
Mer	MMP-7	P-Cadherin
Prostasin	PSMA	SIGIRR
TGFb RIII	Tissue Factor	TWEAK

QAH-CYT-8 Standard Curves



VI. 8-Point Standards

After reconstitution of the lyophilized cytokine standard mix, the 8-point cytokine concentration used for generating the standard curve of a given antigen is listed below. The detection sensitivity of each protein in one experiment is user dependent. Try our array specific Quantibody Q-Analyzer to see your Limit of Detection (LOD). (Section VIII).

Serial standard concentration (pg/ml)

	Cntrl	Std7	Std6	Std5	Std4	Std3	Std2	Std1
ANGPTL3	0	14	41	123	370	1,111	3,333	10,000
βIG-H3	0	14	41	123	370	1,111	3,333	10,000
CA9	0	14	41	123	370	1,111	3,333	10,000
Cathepsin B	0	14	41	123	370	1,111	3,333	10,000
CD23	0	14	41	123	370	1,111	3,333	10,000
CHI3L1	0	14	41	123	370	1,111	3,333	10,000
CTLA4	0	5	16	49	148	444	1,333	4,000
Dkk-4	0	137	412	1,235	3,704	11,111	33,333	100,000
DPPIV	0	274	823	2,469	7,407	22,222	66,667	200,000
EDA-A2	0	14	41	123	370	1,111	3,333	10,000
Epo R	0	55	165	494	1,481	4,444	13,333	40,000
FGF-6	0	14	41	123	370	1,111	3,333	10,000
FGF-9	0	5	16	49	148	444	1,333	4,000
Gas1	0	137	412	1,235	3,704	11,111	33,333	100,000
IGFBP-5	0	274	823	2,469	7,407	22,222	66,667	200,000
IL-1F5	0	274	823	2,469	7,407	22,222	66,667	200,000
IL-1F6	0	137	412	1,235	3,704	11,111	33,333	100,000
IL-1F7	0	137	412	1,235	3,704	11,111	33,333	100,000
IL-1F8	0	5	16	49	148	444	1,333	4,000
IL-1F9	0	137	412	1,235	3,704	11,111	33,333	100,000
IL-1F10	0	274	823	2,469	7,407	22,222	66,667	200,000
IL-1R5	0	1	4	12	37	111	333	1,000
IL-17C	0	549	1,646	4,938	14,815	44,444	133,333	400,000
IL-18	0	55	165	494	1,481	4,444	13,333	40,000
IL-20	0	137	412	1,235	3,704	11,111	33,333	100,000
IL-34	0	55	165	494	1,481	4,444	13,333	40,000
IL-5 Rα	0	549	1,646	4,938	14,815	44,444	133,333	400,000
IL-10 Rα	0	274	823	2,469	7,407	22,222	66,667	200,000
Layilin	0	14	41	123	370	1,111	3,333	10,000
Leptin R	0	137	412	1,235	3,704	11,111	33,333	100,000
Marapsin	0	27	82	247	741	2,222	6,667	20,000
Mer	0	14	41	123	370	1,111	3,333	10,000
MMP-7	0	137	412	1,235	3,704	11,111	33,333	100,000
P-Cadherin	0	137	412	1,235	3,704	11,111	33,333	100,000
Prostasin	0	27	82	247	741	2,222	6,667	20,000
PSMA	0	137	412	1,235	3,704	11,111	33,333	100,000
SIGIRR	0	137	412	1,235	3,704	11,111	33,333	100,000
TGFβ RIII	0	27	82	247	741	2,222	6,667	20,000
TF	0	5	16	49	148	444	1,333	4,000
TWEAK	0	137	412	1,235	3,704	11,111	33,333	100,000

VII. System Recovery

The antibody pairs used in the kit have been tested to recognize their specific antigen. The spiking recovery rate of the cytokines by the kit in 2x diluted Human serum H4522 and 2x diluted Human cell culture media (CM) is listed in the following table.

The spiking recovery rate for human culture media and serum

(pg/ml)	Spiking	CM	CM+Ag	CM%	Serum	Serum+Ag	Serum%
ANGPTL3	5,000	10	10,584	211%	8,843	12,758	78%
β IG-H3	5,000	5,589	9,083	70%	4,374	7,120	55%
CA9	5,000	81	4,018	79%	0	4,002	80%
Cathepsin B	10,000	923	9,152	82%	818	10,639	98%
CD23	5,000	0	3,797	76%	143	2,855	54%
CHI3L1	5,000	3,631	7,366	75%	6,197	5,744	-
CTLA4	2,000	0	2,447	122%	0	1,004	50%
Dkk-4	50,000	0	52,429	105%	209	30,514	61%
DPPIV	100,000	39	80,750	81%	43,683	45,822	2%
EDA-A2	5,000	0	4,496	90%	0	4,200	84%
Epo R	20,000	0	18,782	94%	0	17,157	86%
FGF-6	5,000	0	4,338	87%	0	4,166	83%
FGF-9	2,000	0	1,802	90%	0	1,032	52%
Gas1	50,000	0	64,600	129%	0	48,587	97%
IGFBP-5	100,000	863	108,549	108%	0	110,436	110%
IL-1F5	200,000	0	233,801	117%	17,572	174,906	79%
IL-1F6	50,000	0	47,472	95%	0	50,807	102%
IL-1F7	50,000	0	53,759	108%	146	22,684	45%
IL-1F8	2,000	0	2,058	103%	0	1,295	65%
IL-1F9	50,000	0	42,475	85%	0	27,087	54%
IL-1F10	100,000	0	141,759	142%	2,160	131,237	129%
IL-1R5	500	0	687	137%	0	913	183%
IL-17C	200,000	1,759	202,598	100%	0	93,568	47%
IL-18	20,000	0	24,192	121%	74	8,870	44%
IL-20	100,000	2,145	93,449	91%	0	142,762	143%
IL-34	20,000	0	8,434	42%	0	12,508	63%
IL-5 R α	200,000	21	186,405	93%	0	126,640	63%
IL-10 R α	100,000	776	114,978	114%	0	112,518	113%
Layilin	5,000	46	6,780	135%	0	1,845	37%
Leptin R	50,000	88	36,379	73%	0	32,201	64%
Marapsin	20,000	0	17,315	87%	2,474	29,551	135%
Mer	5,000	0	8,723	174%	0	7,598	152%
MMP-7	50,000	1,554	70,836	139%	973	52,519	103%
P-Cadherin	50,000	741	60,633	120%	27,552	69,308	84%
Prostasin	10,000	32	5,868	58%	0	5,576	56%
PSMA	100,000	1,234	139,781	139%	0	159,932	160%
SIGIRR	50,000	0	59,392	119%	0	24,474	49%
TGF β RIII	10,000	38	14,171	141%	4,155	19,112	150%
TF	2,500	18	3,168	126%	40	3,476	137%
TWEAK	50,000	91	57,724	115%	1,939	42,169	80%

VIII. Quantibody® Q-Analyzer

Quantibody Q-Analyzer is an array specific, Excel-based program. However, it is not a simple calculation macro as it contains sophisticated data analysis.

Key features:

- Simplicity: Easy to operate and requires no professional training. With a simple copy and paste process, the cytokine concentration is determined.
- Outlier Marking & Removing: The software can automatically mark and remove the outlier spots for more accurate data analysis
- Normalization: The program allows for intra- and inter-slide normalization for large number of samples.
- Two Positive Controls: The program takes the two positive controls in each array for normalization.
- Two Analytical Algorithms: Users can choose either linear regression or log-log algorithms to meet their analytical needs.
- Two Data Outputs: standard curves and digital concentration.
- User Intervention: The program allows for user manual handling of those outliers and other analytical data.
- Lower and Upper Limits Determination: The program automatically marks out the values below or above the detection range.
- Standard Deviation: The program outputs the standard deviations of the quadruplicate spots for data accuracy.
- Analytical Tips: Q-Analyzer analysis tips are included in the program.

IX. Troubleshooting guide

Problem	Cause	Recommendation
Weak Signal	Inadequate detection	Increase laser power and PMT parameters
	Inadequate reagent volumes or improper dilution	Check pipettes and ensure correct preparation
	Short incubation time	Ensure sufficient incubation time and change sample incubation step to overnight
	Too low protein concentration in sample	Don't make too low dilution or concentrate sample
	Improper storage of kit	Store kit as suggested temperature. Don't freeze/thaw the slide.
Uneven signal	Bubble formed during incubation	Avoid bubble formation during incubation
	Arrays are not completely covered by reagent	Completely cover arrays with solution
	Reagent evaporation	Cover the incubation chamber with adhesive film during incubation
Poor standard curve	Cross-contamination from neighboring wells	Avoid overflowing wash buffer
	Comet tail formation	Air dry the slide for at least 1 hour before usage
	Inadequate standard reconstitution or Improper dilution	Reconstitute the lyophilized standard well at the room temperature before making serial dilutions. Check pipettes and ensure proper serial dilutions.
	Inadequate detection	Increase laser power that the highest standard concentration for each cytokine receives the highest possible reading yet remains unsaturated.
	Use freeze-thawed cytokine standards	Always use new cytokine standard vial for new set of experiment. Discard any leftover.
High background	Overexposure	Lower the laser power
	Dark spots	Completely remove wash buffer in each wash step.
	Insufficient wash	Increase wash time and use more wash buffer
	Dust	Work in clean environment
	Slide is allowed to dry out	Don't dry out slides during experiment.

X. Select Quantibody Publications

Quantibody products have been referenced in hundreds of publications. Following are only some of the selections.

- Gao, et al. A Chinese herbal decoction, Danggui Buxue Tang, activates extracellular signal-regulated kinase in cultured T-lymphocytes. *FEBS Letters*, 2007; 581(26): 5087-5093.
- Zhai, et al. Coordinated Changes in mRNA Turnover, Translation, and RNA Processing Bodies in Bronchial Epithelial Cells following Inflammatory Stimulation. *Molecular and Cellular Biology*. 2008; 28(24): 7414-7426.
- Toh HC et al: Clinical Benefit of Allogeneic Melanoma Cell Lysate–Pulsed Autologous Dendritic Cell Vaccine in MAGE-Positive Colorectal Cancer Patients. *Clin Cancer Res* 2009 15:7726-7736
- Willingham, SB et al. NLRP3 (NALP3, Cryopyrin) facilitates in vivo caspase-1 activation, necrosis, and HMGB1 release via inflammasome-dependent and -independent pathways. *J Immunol*. 2009; 183(3):2008-15
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- Rajkumar T et al: Identification and validation of genes involved in gastric tumorigenesis. *Cancer Cell Int*. 2010 10(1):45
- Lewis JA et al: Analysis of Secreted Proteins as an in vitro Model for Discovery of Liver Toxicity Markers. *J Proteome Res*. 2010; 9(11):5794-802
- Montes AH et al: The MMP1 (-16071G/2G) single nucleotide polymorphism associates with the HAART-related lipodystrophic syndrome. *AIDS*. 2010 24(16):2499-506
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XI. Experiment Record Form

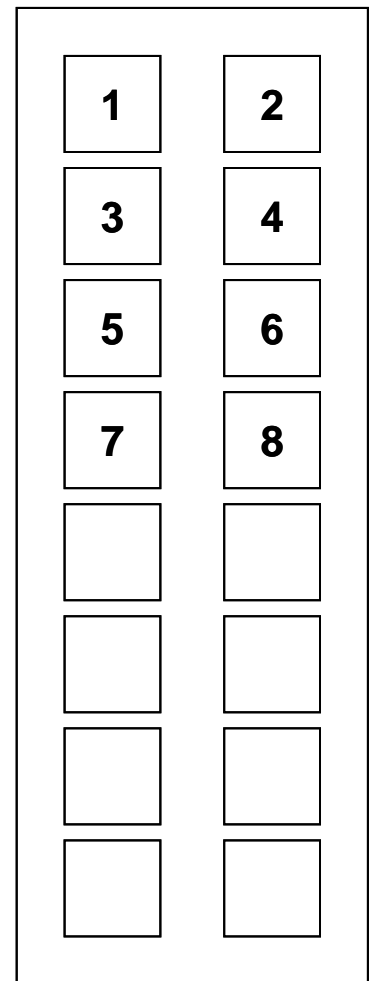
Date: _____

File Name: _____

Laser Power: _____

PMT: _____

Well No.	Sample Name	Dilution factor
1	CNTRL	
2	Std7	
3	Std6	
4	Std5	
5	Std4	
6	Std3	
7	Std2	
8	Std1	
9		
10		
11		
12		
13		
14		
15		
16		



XII. How to Choose Quantibody® Products?

Species-based selection:

- **Human:** (QAH-)
- **Mouse:** (QAM-)
- **Rat:** QAR
- **Porcine:** QAP-CYT-1
- **Non-Human Primates (NHP):** QAN-CYT-1
- **Canine:** QAC-CYT-1
- **Feline:** QAF-CYT-1
- **Equine:** QAE-CYT-1
- **Bovine:** QAB-CYT-1

Function-based selection:

- **TH1/TH2/TH17 Array:** QAH-TH-1, QAH-TH17, QAM-TH17
- **Inflammation Arrays:** QAH-INF-1, QAH-INF-2, QAH-INF-3; QAM-INF-1; QAR-INF-1
- **Angiogenesis Arrays:** QAH-ANG-1, QAH-ANG-2, QAH-ANG-3, QAH-ANG-1000
- **Chemokine Arrays:** QAH-CHE-1, QAM-CHE-1
- **MMP Array:** QAH-MMP-1
- **Immunoglobulin Isotype Array:** QAH-ISO-1; AAM-ISO-G1
- **Dried Eye Disease:** QAH-DED-1
- **Periodontal Disease:** QAH-PDD-1
- **Sepsis Biomarker:** QAH-SEP-1

Cytokine Number-based selection:

- **360 cytokines:** QAH-CAA-8000
- **320 cytokines:** QAH-CAA-7000
- **280 cytokines:** QAH-CAA-6000
- **240 cytokines:** QAH-CAA-5000
- **200 cytokines:** QAH-CAA-4000; QAM-CAA-4000
- **160 cytokines:** QAH-CAA-3000, QAM-CAA-3000
- **120 cytokines:** QAH-CAA-2000; QAM-CAA-2000
- **80 cytokines:** QAH-CAA-1000; QAM-CAA-1000
- **60 cytokines:** QAH-ANG-1000; QAM-CYT-Q2000
- **40 cytokines:** QAH-INF-3, QAH-CHE-1, QAH-GF-1, QAH-REC-1, QAH-CYT-4,
- **30 cytokines:** QAH-ANG-2, QAH-ANG-3, QAM-INT-1000, QAR-CYT-3, QAM-CHE-1
- **20 cytokines:** QAH-CYT-1, QAH-CYT-2, QAM-CYT-1, QAM-CYT-2, QAM-CYT-3
- **10 cytokines:** QAH-TH-1, QAH-INF-1, QAH-INF-2, QAH-ANG-1, QAH-MMP-1
- **less than 10 cytokines:** QAH-ISO-1, QAH-ADI-2, QAP-CYT-1, QAM-ISO-G1

Purpose-based selection --- Custom Arrays

- Choose from over 1000 cytokine pool; Any kind; Any number
- Order slide only or full service in house
- Desired marker not in our pool? No problem! For certain developmental fee, we may be able to add the marker to your panel if the paired antibodies are available on the market.

Note:

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Cytokine protein arrays are RayBiotech patent-pending technology.

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