

QuantumPlex™ Beads Provide the Ideal Platform for a Variety of Multiplexing Applications

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What is Multiplexing?

Multiplexing is the ability to simultaneously:

- Test multiple samples
- Detect multiple analytes in a given sample

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Current Multiplexing Applications

- Cell signaling (cytokines)
- Viral screening
- Autoimmunity assays
- Allergen testing
- Genomics
- Pharmaceutical trials
- Blood typing / banking
- Molecular diagnostics

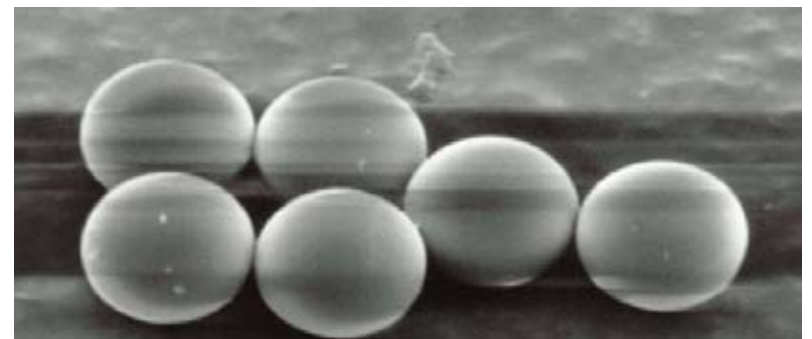
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QuantumPlex™ Overview

- 5-bead set
- 4.4µm or 5.5µm beads
- Internally dyed with Bangs' Starfire Red™ fluorescent dye
- May be acquired / analyzed on any standard cytometer
- Goat anti-Mouse (GAM), Streptavidin, or Carboxylated surface

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SEM of 5.5µm QuantumPlex



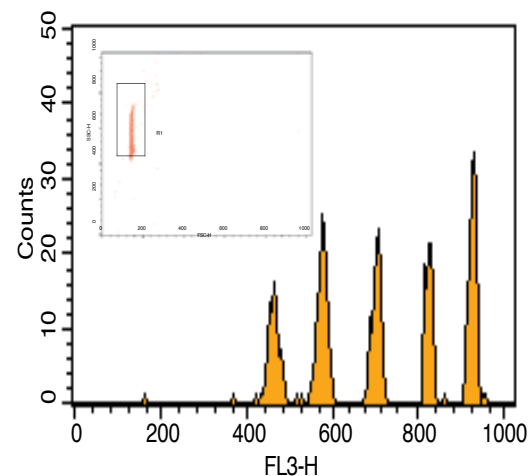
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Starfire Red™ Dye

- Excited with any common laser (350, 488, 633nm)
- Emits far red (685-690nm)
- Very little carry-over into other fluorescent channels
- Low signal in FL1, FL2 allows use of common Fluorescein and Phycoerythrin antibodies for analyte detection

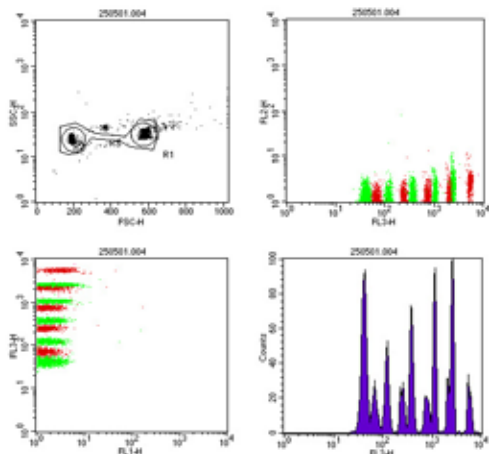
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Five Peaks in FL3 Channel



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4.4µm and 5.5µm

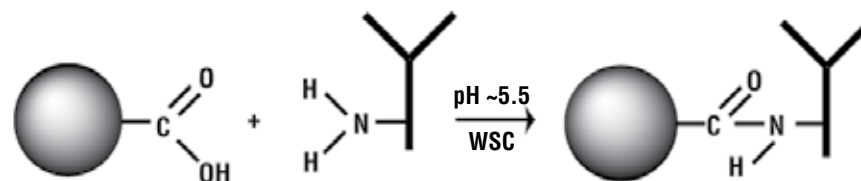


Bang's beads Set3
(4.4u) and 4 (5.5u)
mixed

File: 250501.004 Acquisition Date: 25-May-01
Gate: G3 Gated Events: 9774
Total Events: 10000 X Parameter: FL3-H(Log)
Marker Events % Gated Mean Geo Mean Median
A8 9774 100.00 987.00 329.37 359.66

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QuantumPlex COOH



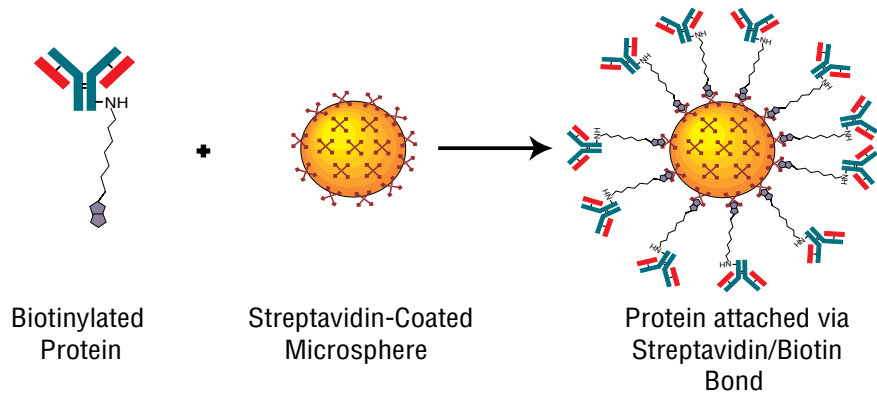
Carboxylate-
modified
microsphere

Ligand with
available
amine

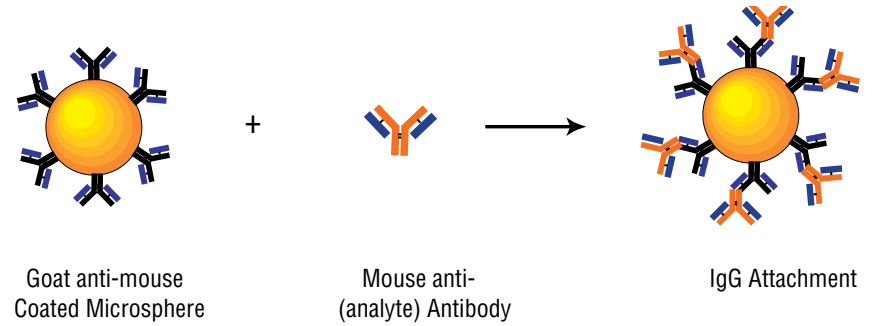
Ligand bound
via amine
bond

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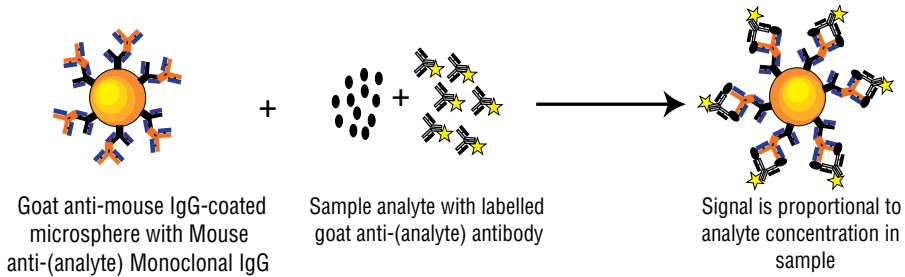
QuantumPlex SA



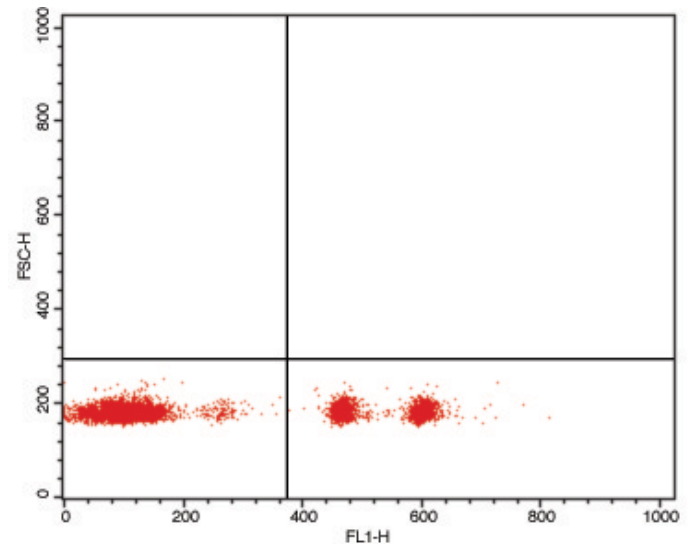
QuantumPlex GAM



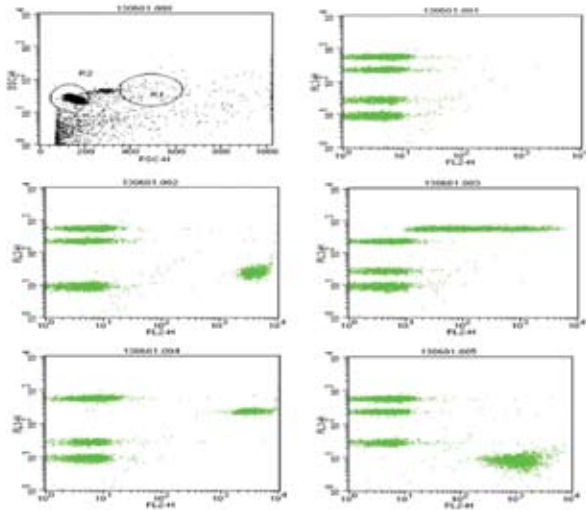
Testing Samples



Determining "Positives"



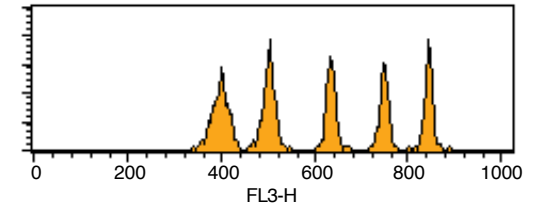
Cytokine Assay



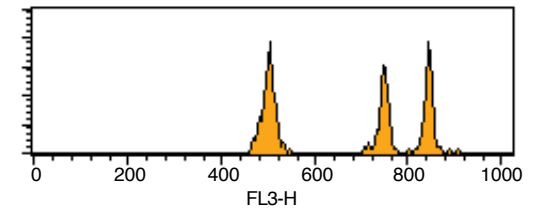
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Positive Populations

Original Peaks



Positive Peaks



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Benefits of QuantumPlexing

Using one 5-bead set, and reporter antibodies fluorescent in only one channel, you may:

- Simultaneously test 5 samples for a single analyte
- Simultaneously test one sample for up to 5 analytes

Using two 5-bead sets, or reporter antibodies fluorescent in different channels, increases the number of analytes you may test for by two-fold.

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Benefits of QuantumPlexing

- Reduced cost (supplies, reagents, labor)
- Reduced time
- Ability to quickly and accurately compare samples

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Acknowledgments

- The Bangs' QuantumPlex team
- Kathy Turner, Bangs Laboratories, Inc.
- Dr. John Lawry, Sheffield University, UK
- Applied Cytometry Systems, UK

Final Comments

For additional information, a copy of this lecture,
or to discuss OEM arrangements using QuantumPlex,
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