

# Painless Particles®

Global Newsletter  
Volume 18, #1, Winter 2005



A DIVISION OF POLYSCIENCES, INC.

**B E A D S ● A B O V E T H E R E S T™**

## ● In This Issue

BioMag® Solutions .....	1
Freezing Season .....	1
Happy New Year!.....	1
YG Fluorescent Spheres .....	2
QuantumPlex™M .....	2
Ask "The Particle Doctor®" .....	3
Mail Bonding .....	3
Technical References and TechNotes....	4

## Freezing Season



As winter has arrived in North America, we are taking precautions so that orders do not freeze while in transit to you. This includes not shipping on

Fridays – to avoid freezing conditions over the weekend. (So, please "bear" this in mind when placing an order.)

## Happy New Year!

The staff at Bangs Labs would like to wish you all a joyous and prosperous New Year. In appreciation of our association, please find a 2005 computer calendar enclosed within the pages of the Product Selection Guide. (The dates highlighted in green are the days Bangs Labs will be closed.)

## BioMag® Solutions BioMag ProMax Serum IgG Removal Kit

Changes that occur in serum and plasma proteins have long been recognized as a way to investigate and monitor physiological changes. This rich source of information does, however, present challenges for most of the analytical methods used. One of the reasons for this is that one-dimensional and two-dimensional electrophoresis, high performance liquid chromatography, and mass spectroscopy have a limited dynamic range for the amount of protein mass that can be loaded and resolved. This limited range affects the resolution of less abundant proteins. Albumin can represent 50-70% total protein in serum and IgG can represent 10-20% of the total protein in serum, masking the ability to detect less abundant proteins of interest. If the majority of these two proteins can be removed from serum samples, a significant improvement in resolution of less abundant proteins can be obtained.

The **BioMag® ProMax Serum IgG Removal Kit** (Catalog Code **BP659**) is based on patented BioMag superparamagnetic particle technology. The ProMax IgG Removal Particles, in combination with specific buffer conditions, bind the IgG from the serum, enabling it to be depleted from the sample. Using magnetically responsive particles for depletion of IgG has advantages over other systems. Removal of IgG with the ProMax IgG Removal Kit is a rapid and simple procedure that requires no pretreatment of the sample. In addition, the ProMax system does not require the use of time-consuming columns or centrifugation. The ProMax protocol is scalable and can be used in conjunction with the **BioMag® ProMax Albumin Removal Kit** (Catalog Code **BP658**).

Figure 1:

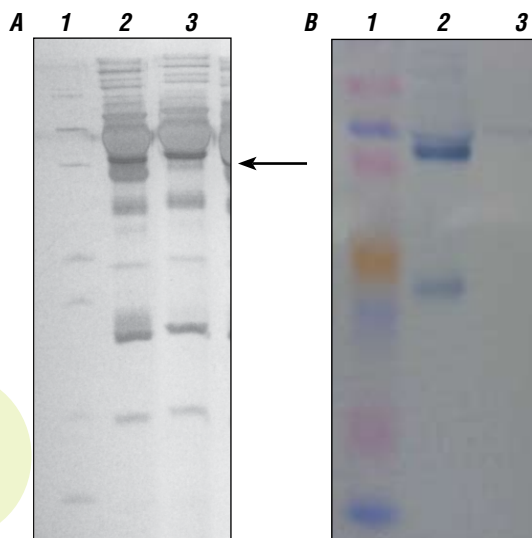


Figure 1. SDS-PAGE analysis and Western Blot showing depletion of IgG from human serum.

Panel A: Silver Stained SDS-PAGE Gel  
Lane 1, Molecular Weight (MW) markers;  
Lane 2, untreated normal human serum;  
Lane 3, serum treated with BioMag®  
ProMax Serum IgG Removal Kit. Lanes 2  
and 3 were loaded with equal amounts of  
protein. The arrow indicates the location of  
the major IgG band.

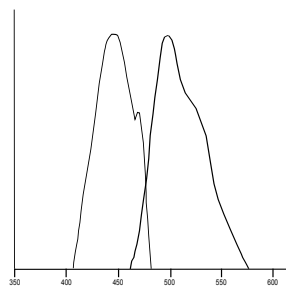
Panel B: Western Blot  
Lane 1, MW markers; Lane 2, normal  
serum; Lane 3, serum treated with the  
BioMag® ProMax Serum IgG Removal  
Kit. IgG was visualized using a goat anti-  
human horseradish peroxidase conjugate  
and TMB as the chromagen. Both Lanes  
2 and 3 were loaded with equal amounts  
of protein. Lane 3 shows that nearly all  
of the IgG has been depleted from the  
sample.



## YG Fluorescent Spheres

We are pleased to announce the expansion of our line of fluorescent microspheres.

We have a number of new "standard list" YG products that you can expect to find on our inventory at all times. These span the range of 0.5µm to 10µm in size, for applications from ELISA-type assays (using a small fluorescent sphere as the reporter) to flow cytometry. Non-functionalized and carboxyl-functionalized surfaces are available to support adsorption and covalent immobilization strategies.



### YG

Excitation Maximum: 441nm  
Emission Maximum: 486nm

Wavelength (nm)

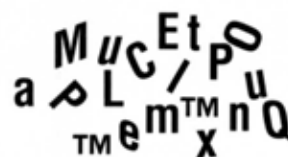


"Don't mind Ashley. After looking through a microscope all day, anything large startles him."

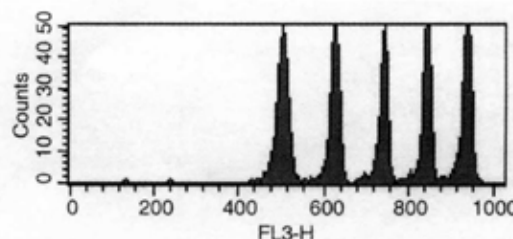
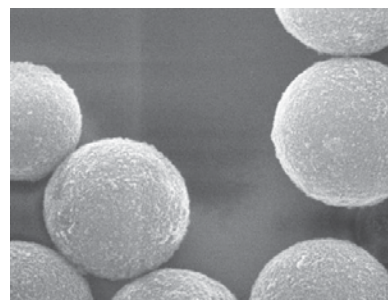
Cartoon reprinted with special permission from Sidney Harris <SHarris777@aol.com> and [www.sciencecartoonsplus.com](http://www.sciencecartoonsplus.com).

## QuantumPlex™M

Well, we did it...we developed a COMPLEX...



However, as the boss wouldn't let us use the clever name (COMPLEX), we are instead pleased to introduce **QuantumPlex™M**, the newest addition to our QuantumPlex product line. We dyed our highly uniform 6µm COMPEL™ superparamagnetic microspheres with different intensities of Starfire Red™ to bring our customers the benefits of a multiplexed assay platform and the convenience of a magnetic separation. QuantumPlexM are suitable for use with any conventional cytometer, and magnetic separations may be performed using a standard laboratory (rare earth) magnetic separation device.

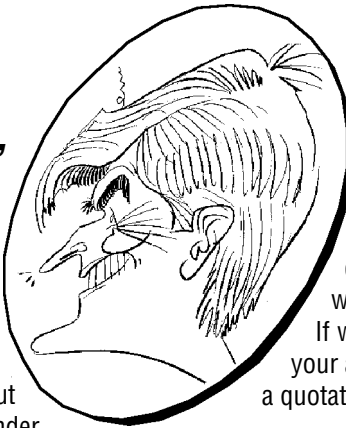


Each kit is comprised of 5 intensity populations, to which different capture molecules may be conjugated for the development of multiplexed assays. Carboxyl and streptavidin surfaces are available. Starfire Red™ has very little carryover into lower wavelengths, leaving other detectors (e.g. green, orange) available for the monitoring of reporter fluorescence.

Catalog Code **250**: QuantumPlex™M Carboxyl  
Catalog Code **252**: QuantumPlex™M Streptavidin

Contact us at: [info@bangslabs.com](mailto:info@bangslabs.com) with any questions or to discuss availability of magnetic separators.

## Ask “The Particle Doctor®”



**Q** : I routinely use your Low Level Quantum™ Simply Cellular® Goat anti-Mouse kits (Catalog Code 814) as a quantitative tool in my lab, but I see that 814 is no longer available on your website. HELP!

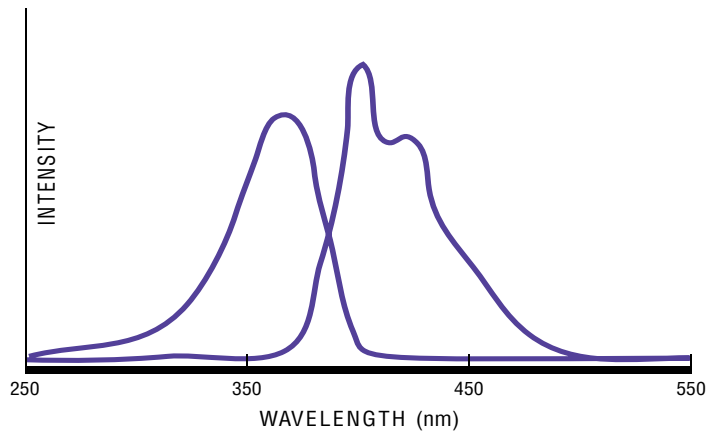
**A** : Don't be alarmed! After our new Flow Team put the **Quantum™ Simply Cellular® (QSC)** kits under scrutiny, in support of our ongoing goal to offer the highest quality products, a few changes were made. 1) The Low Level 814 kit and the Medium Level 815 kit were combined to satisfy the requirements of both users, and 815 simply won as the catalog code to maintain. 2) The new **QSC Goat anti-Mouse** kits (Catalog Code **815**), as well as the **QSC Goat anti-Human** kits (Catalog Code **816**), are now being shipped in five separate bottles, a blank and four different Antibody Binding Capacity (ABC) levels. Instead of receiving your normal 1mL, 5mL or 14mL premixed quantities, you will be receiving 1mL, 5mL or 14mL of each bead component. A much better value for you!

**Q** : Do you have any fluorescent beads that are suitable for UV & Violet excitation?

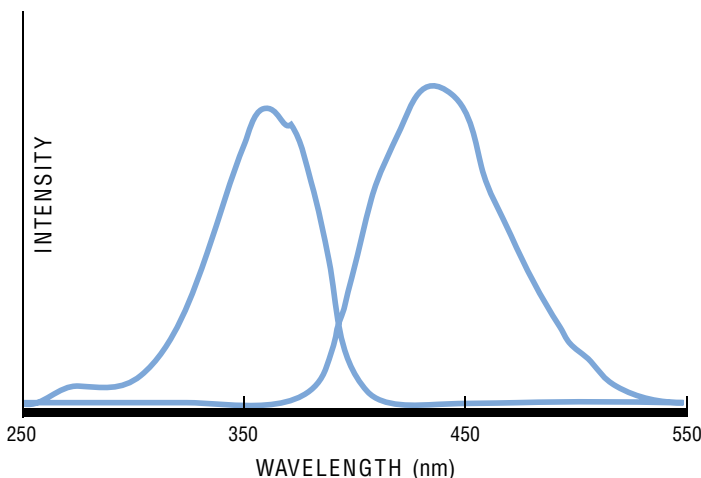
**A** : In addition to **Plum Purple**, we are pleased to introduce our new violet- and UV-excitable fluorophores, **Glacial Blue** and **Ultra Violet**. We also have a few offerings on our inventory to support applications in flow cytometry.

Our TechNotes 103 and 103A, which may be downloaded from the Tech Support portion of our website, provide spectra for our other fluorophores. If we don't have a product on inventory that is ideal for your application, we would be pleased to provide you with a quotation for a custom project.

Ultra Violet (360, 390)



Glacial Blue (360, 450)



### Mail Bonding

(Subscribers "do the 'write' thing!")

❖ *We really like working with you guys, since you've been consistently helpful. JT., MA*

*I have long held a very high opinion of Bangs' innovative products, customer service, and technical expertise. I will continue to recommend Bangs to my colleagues. P.F., WA*

❖

❖ *Thank you very much for your kind and detailed answers, and I was impressed by the swift customer service from Bangs Labs. J.L., South Korea*

"Great things are not done by impulse, but by a series of small things brought together." – Vincent Van Gogh

Technical References – See our website ([www.bangslabs.com](http://www.bangslabs.com)) for "downloadable" TechNotes and Product Data Sheets or ask for copies by mail or fax. We continually update and add new TechNotes and Product Data Sheets to our website.

### Product-Specific TechNotes:

101. **ProActive® Microspheres** – Handling tips plus protocols for streptavidin, Protein A, and goat anti-Mouse coated microspheres.
102. **Magnetic Microparticles** – Characteristics, handling tips, and applications for superparamagnetic particles.
103. **Fluorescent/Dyed Microspheres** – Applications, fluorescence spectra, and product descriptions. Plus QuantumPlex™ microspheres for multiplexing, flow cytometry, and confocal microscope standards.
104. **Silica Microspheres** – For immunoassays, nucleic acid capture, velocimetry (LDV, PIV), flat panel display spacers, and others.
105. **Microsphere Size Standards** – Beads for cell size estimation, filter challenge, and instrument checks and calibrations. NIST-traceable standards from 0.27µm to 25µm.
106. **Confocal Standards** – Using our three, bright, single-label 60nm fluorescent beads in confocal microscopy.

### Handling-Specific TechNotes:

201. **Working with Microspheres** – Choosing, cleaning, characterizing, coating beads, etc.
202. **Microsphere Aggregation** – Preventing, detecting, and reversing aggregation. Chemicals and equipment sources.
203. **Washing Microspheres** – Variety of methods for cleaning microspheres; advantages/disadvantages of methods; suppliers of equipment.
204. **Adsorption to Microspheres** – Adsorbing protein onto particles; use of "surface diluents" (blockers); recipes and references.
205. **Covalent Coupling** – Chemical attachment of proteins, nucleic acids, etc. to various types of surface-functionalized microspheres; recipes for buffers, blockers; miscellaneous coupling ideas, vendor information, and references.
206. **Equations** – For calculating particles/mL, area/g, "parking area", settling velocity @ 1G and in centrifuge, etc.
208. **Microsphere Sizing** – Various manual and automated methods are described and discussed, with references and supplier list.

### Application-Specific TechNotes:

301. **Immunological Applications** – Review of commercial applications of microspheres.
302. **Molecular Biology** – Overview of purification and solid phase separation methods.
303. **Lateral Flow Tests** – Putting dyed particles on membranes so they will move properly.
304. **Light-Scattering Assays** – Turbidimetric and nephelometric applications of microspheres.

### Reprints:

402. **Microspheres, part 1: Selection, cleaning, and characterization, and part 2: Ligand attachment and test formulation** – LB Bangs & Mary Meza, *IVD Technology (in Medical Device & Diagnostic Industry)*, **17**, #3, 18-26, March, and #4, 20-26, April, 1995. (Note that you can download these papers at the IVDT website: [www.devicelink.com/ivdt/archive/95/03/009.html](http://www.devicelink.com/ivdt/archive/95/03/009.html) and [.../95/04/006.html](http://www.devicelink.com/ivdt/archive/95/04/006.html)).
403. **New Developments in Particle-Based Immunoassays** – Leigh B. Bangs, *Pure & Appl. Chem.*, **68**, #10, 1873-1879 (1996). Review of 40 years of diagnostic uses of microspheres – from LATs to biosensors.
405. **Applications of Magnetic Particles in Immunoassays** – Mary Meza, Ch. 22 (pp. 303-309) in *Scientific and Clinical Applications of Magnetic Carriers*, U. Häfeli, *et al*, Eds., Plenum Press, New York, 1997.
406. **Measuring Microsphere Binding Capacity** – JM Duffy, JV Wall, MB Meza, LJ Jenki, *IVD Technology*, **4**, #7, 28-34 (1988). (No reprints are available; you can download from our website.)
407. **Bead-based HTS Applications in Drug Discovery** – MB Meza, *Drug Discovery Today: HTS Supplement*, **1**, #1, 38-41 (2000).

**Flow Cytometry Standards?** See the "flow" portion of our website for lots of technical information about flow cytometry standardization in general and our expanding line of flow cytometry standards products in particular.

If you aren't able to locate answers to your microsphere application or handling/use questions (within our TechNotes, Product Data Sheets, FAQs, References, or Product Brochures, we invite you to call us directly, or to contact "The Particle Doctor®" through our website.