Painless Particles®

Global Newsletter
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Bangs Laboratories, Inc.
A DIVISION OF POLYSCIENCES, INC.

BEADS ABOVE THE REST™

In This Issue

Introducing:

SNARe™ DNA Purification Systems

Our new **SNARe™** DNA Purification Systems offer rapid, cost-effective methods for isolating DNA. The Purification Systems utilize SNARe DNA Separation Particles – high surface area, superparamagnetic particles with a mean diameter of ~1.5µm. Once bound, the DNA-particle complex is stable and can be washed to remove any impurities or unwanted proteins from the sample to provide a clean DNA preparation. The DNA is eluted from the DNA-particle complex with an Elution Buffer and is ready for use in downstream reactions, such as SNP genotyping, PCR, labeling, sequencing, transfection, cloning, and restriction digestion.

SNARe™ (Simple Nucleic Acid Recovery) products are based on a new patent pending technology developed in Polysciences' laboratories. SNARe offers the following advantages over other DNA purification methods:

- Easy-to-use procedure
- No need for columns or filters
- Eliminates laborious centrifugation steps
- Scalable – easily adjusts for sample size and automation
- DNA is immediately available for PCR, restriction digestion

SNARe™ continued on page 2

"On the Road Again!"

BLI Tradeshow Schedule

- ISAC XXIII International Congress*
  May 24-26, 2006. Québec City, Canada
  Booth 209, www.isac2006.org
- ASM 106th Annual Meeting
  May 22-24, 2006. Orlando, FL
  Booth 346, www.asm.org
- **The Latex Course™ 2006**
  October 1-4, 2006. Orlando, FL
  www.bangslabs.com

You're Invited to...

The Latex Course™ 2006

What: The Latex Course™ 2006 is a microsphere education event. Experts in various life sciences fields will share their knowledge with attendees through organized lecture, discussion, and exhibits. Topics will include microsphere applications, assay development, and reagent manufacture. Visit the our website for current details.

Where: Disney's Contemporary Resort, *Walt Disney World®* Resort, Florida

When: October 1-4, 2006

Fee: $1375 if paid by July 31, 2006; $1475 thereafter (purchase orders, VISA, and MasterCard accepted). Fee includes: reception, conference dinner, breakfasts, and lunches. Attendees will also receive the 2006 Latex Course Book (copies of all lectures).

Registration: In the next few weeks, a brochure will be sent through the mail outlining pertinent information, such as program description, speakers and topics, hotel reservations, travel, and registration. Please visit our website for details.

*ISAC XXIII International Congress

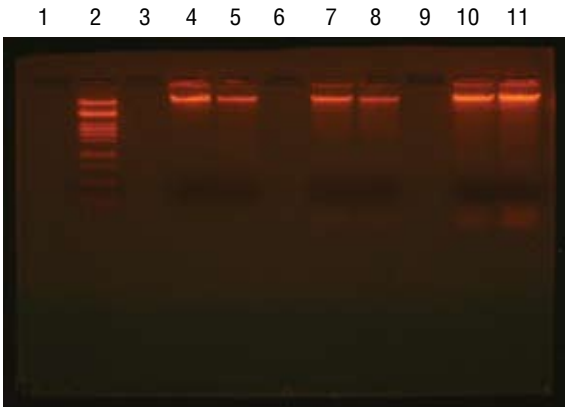
Bangs Labs Lunch Tutorial

Join us for a lunchtime tutorial at ISAC. Bangs Laboratories will be presenting a tutorial about establishing a standardized program for flow cytometry: instrument QC, set-up, and fluorescence quantitation. The tutorial is free, but will be limited to the first 75 registrants. Please register online at www.bangslabs.com.

SNARe™ continued from page 1

Catalog Code	Product Description
BP691	SNARe™ Genomic DNA Purification System
BP692	SNARe™ Plasmid DNA Purification System
BP693	SNARe™ Plant Genomic DNA Purification System

Figure 1: DNA Isolated from Whole Blood



Lane 1: NA; Lane 2: Molecular Weight Standards Lambda DNA PST-1; Lane 3: NA; Lane 4: Competitor Magnetic Separation Protocol; Lane 5: Competitor Magnetic Separation Protocol; Lane 6: NA; Lane 7: SNARe™ DNA Purification System; Lane 8: SNARe™ DNA Purification System; Lane 9: NA; Lane 10: SNARe™ DNA Purification System; Lane 11: SNARe™ DNA Purification System

Cartoon reprinted with special permission from Sidney Harris <SHarris777@aol.com> and www.sciencecartoonsplus.com.

Quantum Cy5 MESF
So Many Kits to Choose From!!

Since we didn't want our **Quantum APC MESF Kit** to feel like the only new kid on the block, we have also released our **Quantum Cy5 MESF Kit**!

Our MESF kit offerings now include:

Cy5	Cat Code 822
APC	823
FITC (low)	824
FITC (medium)	826
FITC (high)	825
PE	827
PE-Cy5	828

If you simply want a **Cy5 Fluorescent Reference Standard**, we've got it! Now available under Flow Cytometry Catalog Code 895.

P(articles)$_2$ = Particle Articles
Cool Articles Citing the Use of Microspheres

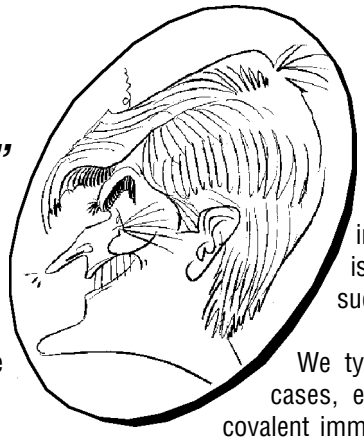
LAT Developed for Monitoring Avian Influenza Virus AIV H5N1 Vaccination Status
Xu X, Jin M, Yu Z, Li H, Qiu D, Tan Y, Chen H. (2005) Latex agglutination test for monitoring antibodies to avian influenza virus subtype H5N1. J Clin Microbiol; 43(4):1953-1955.

Investigators at Huazhong Agricultural University, Wuhan, developed a latex agglutination test (LAT) for antibodies to the avian influenza virus subtype H5N1 using **0.8µm polystyrene microspheres**. The LAT has been used for highly sensitive screening of field serum samples for monitoring antibodies to AIV H5N1 vaccines.

Magnetic Bead-ELISA for Cytokines
McNeill, A, Kastrupt J, Bäckström BT. (2004) A simplified cytokine immunoassay using magnetic polymer particles. Scand J Immunol; 60:287-291.

A simple and sensitive bead-ELISA for TNF-α, IFN-γ, and IL-4 was developed using polymer magnetic beads. For highly efficient magnetic separations, try our highly uniform **COMPEL superparamagnetic microspheres.**

Ask *"The Particle Doctor®"*



Q: I see that you sell standards for some, but not all, of the fluorochromes that I use. For some (Cy-Chrome™, BD Biosciences), I simply need a reference standard, and for others (Alexa Fluor® 488, Molecular Probes, Inc.), I need to be able to quantitate the fluorescence signal. What can I use?

A: For fluorescence quantitation, the same fluorophore must be on beads and cells. (This ensures that the beads respond to the environment in the same fashion as cells, and quantitative assignments are truly relevant.) Our **Quantum™ Simply Cellular®** kits are comprised of bead populations labeled with anti-mouse, anti-rat, or anti-human antibodies. They may be labeled directly with your fluorochrome-conjugated primary antibody, or indirectly using your unlabeled primary and a labeled secondary. See our online Flow Cytometry catalog for Product Data Sheets.

For a simple reference standard, there are a few options. If, for example, you have a mouse mAb that is labeled with your fluorochrome, you could use it to stain **protein A** or **anti-mouse IgG** microspheres to create your own fluorescent standard. (Be sure to check the Ab subclass if using protein A.) We have a number of options in ~5-10µm polymer beads that would be suitable for flow. See our online Polymer & Silica Beads catalog for details.

We also sell a wide range of fluorescent bead standards that may serve as reasonable surrogates if you simply wish to check the laser or detector for your fluorochrome. Our flow cytometry **Reference Standards** span the spectrum, from UV to Far Red. Additionally, we have several internally-labeled fluorescent microspheres in our standard catalog. Reference spectra for internally-labeled spheres are now available in the Tech Support portion of our website (TechNotes 103 and 103A).

Q: I'm interested in using PolyLink (EDAC) coupling to attach antibodies to COOH-functionalized beads. However, this method seems to attach to any available amine group of the protein, so I'm not sure if I should use it.

A: Oh, it'll be fine...go ahead and use it. (How we do love to sell beads and reagents!) OK, OK. On a more serious note, using carboxylated beads with **EDAC** will result in some level of nonspecific orientation, although it is generally accepted that the Fc region will preferentially orient toward the bead based on antibody packing, and the slightly greater hydrophobicity of this domain. This immobilization strategy (EDAC activation of bead COOH groups) generally results in sufficient antibody bound, with good activity, and is one of the most common for standard applications, such as immunoassays.

We typically recommend directed binding for special cases, e.g. if the Ab isn't performing when traditional covalent immobilization is used, or for certain ligands such as oligonucleotides, peptides, hormones, etc.

If you decide to explore directed immobilization strategies to orient the antibody, you might consider use of an Fc-binding protein such as protein A or G (although you'll need to confirm the protein's Ab affinity; these proteins do exhibit variable binding, depending on the species in which the Ab was raised as well as Ab subclass). Use of an Fc-specific antibody would also be appropriate. You could also digest the antibody for immobilization of F(ab') fragments, or oxidize the carbohydrate in the Fc region to create aldehydes for direct covalent immobilization or use of a targeted biotinylated linker and a streptavidin support. These methods are certainly valid, but they do involve additional steps. (So … Go **PolyLink**!)

Mail Bonding

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

- *I just recently placed an order for some Protein A microbeads and received them a couple of days later. I could not have asked for better service. It has been a pleasure dealing with your company. Thanks so much for all of the help and info that I have received.* C.N., TX
- *Clearly I've found the right company!* K.M., NM
- *Thanks for the speedy response (your Customer Service team is fantastic, by the way!!)* A.L.L., Canada
- *I've been working with Bangs Labs beads for nearly three years and have become a great fan of your products.* O.A., CA

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Address Service Requested

"In all things of nature there is something of the marvelous." – Aristotle

Technical References – See our website (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 steptavidin, 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 and .../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 Jenski, *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.