PAINLESS PARTICLES™

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In this issue…

Hurry! Bio•Dot Workshop/LA

June 11-13: Strip Test Course: ***"Theory & Practice of Rapid Immunodiagnostic Tests"*** in Orange County, CA; limited to ~20 attendees. Bangs invited to lecture: *"Immunological Applications of Latex Particles."* If interested, contact Bio•Dot Tel: 714-440-3685; Fax: 714-440-3694; e-mail: biodot@biodot.com. If you can't make this one, then the next two are **September 17-19**: Near NYC (?) and **September 22-24**: Amsterdam.

The Latex Course(s)–October:

In two cities famous for bridges: San Francisco and London

Come to the 9th or 10th offering of this popular course: October 1-3 in San Francisco (Ramada Plaza Hotel- Fisherman's Wharf), and October 6-8 in London (Tower Thistle Hotel, near Tower Bridge).

Emerald Diagnostics, Prolabo, and BLI are again sponsoring and planning this three-day course. It will be similar to the last two offerings of the course (April, 1996 in Paris and Princeton), with some new faces, updated information, and improvements every year. With Dr. Seaman from Emerald, we have built the course from two days to the present three-day format. It gets better each time (we hope)! Look for our brochure in June and/or check our website for details.

July 21-24 See y'all in Atlanta!

We are well into our preparations for our 10th year at the AACC show. (Ask to see pictures of our first booth in 1988.)

Booth 2830 (OEM), July 22-24

We will again have a great corner booth location in the OEM section, very near the entrance. Look for our banner welcoming you to "The Microsphere Zone"!

OEM Lecture Series: July 22, 11:40 AM

Room 260W in the convention center– *"Methods for Determining Binding Capacity of Streptavidin-Coated Microspheres"*– Chad Owen will share our recent data (he's in the lab now) demonstrating binding capacities, accelerated and real-time stability.

This lecture series is a showcase for OEM exhibitors only, and again this year we were among only 13 exhibitors invited to do a 20 minute OEM supplier presentation during the show.

Ask at our booth, or see the AACC program, for a map to get to room 260W.

Workshop: July 22, 5:30PM

"Developing Real-World Tests and Assays Using Microspheres (or Latex Particles)" On Tuesday evening, LBB and Chad Owen will present our popular (10th) annual workshop. Location is very convenient, across from the convention center in the Omni Hotel, Thornton Room. We will show you the latest and best ways to use microspheres in immunodiagnostic tests and assays, including the newest FRET (fluorescence resonance energy transfer) assays. We will help folks choose ways to handle and coat beads, and we'll briefly introduce you to our *ProActive*® protein-activated or coated microspheres.

Individual Meetings/Free Consultations

We will arrive on Sunday or Monday– early enough to meet *you* if you want to sit down and chat. We'll have more time that way. Just call ahead to set up times.

June Theme: Double Meanings

EDI: What does it mean to you?

1) EDI = Electronic Data Interchange– or **"The Paperless Revolution"**

In 1995 we incorporated EDI (Electronic Data Interchange) as a tool for intercompany document exchange. EDI has become important for companies who are trying to remain competitive. (Aren't we all?) EDI allows a computer-to-computer exchange of routine business documents like *orders* (hint, hint!) which saves time and money by reducing paperwork and eliminating costly errors.

We are working with Harbinger EDI services. If you are already connected with Harbinger please send us your sender/receiver #; we are ready to establish an EDI link with you. If you are connected to EDI through another service other than Harbinger, we will need your sender/receiver #, qualifier # (DUNS), VAN # (Value Added Network) and your address to establish an EDI link. If you are not currently EDI capable and would like more information, just ask us.

2) EDI = Emerald Diagnostics Inc.– We have been working with these folks for >8 years in presenting "The Latex Course." They have wide-ranging experience in characterizing microspheres and in developing diagnostic tests and assays, like latex agglutination and strip tests. (Dr. Geoffrey Seaman; Tel: 541-343-1317; Fax: 541-686-0499; e-mail: edi@continet.com)

Let's Peek in the Lab

IR-Emitting Dyed Microspheres

We have several exciting new infra-red emitting dyes which can be used to custom-dye almost any microspheres you choose. And whenever you call, there will probably be some new ones to test in *your* application. What beads would *you* like?

(continued on p. 2)

Let's Peek in the Lab (cont'd)

FRET Beads?– Don't fret, we have them!
We have the dyes and particles which are appropriate for the exciting new Fluorescence Resonance Energy Transfer immunoassay (like FETL, col. 3). By the way, we've been teaching this idea for about three years at "The Latex Course" (see p. 1). Apparently, it finally clicked.

Capillary ElectroChromatography Beads
At the suggestion of Rick Stout of Dade (DE) we have explored this market and are now offering our beads to this emerging field. If you are at all interested, please call or write us. We have silica and polymeric (S/DVB) beads in the 1-5 µm sizes most often requested, with a variety of surface chemistries. *(Now accepting call-in requests!)*

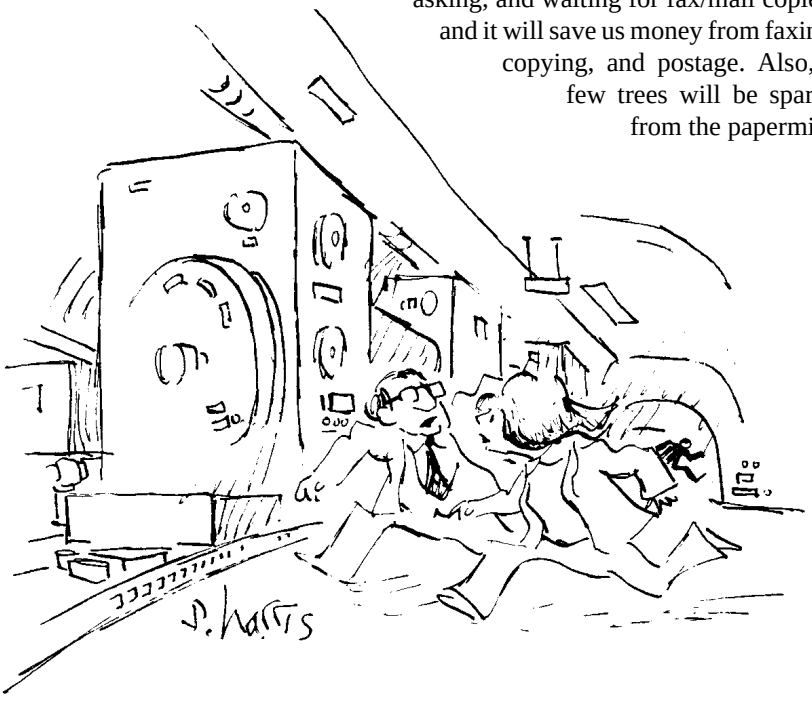
Surface-Dyed Microspheres
Several times recently we have been asked for beads with dye on the surface. We found one really neat method which works with many water-soluble dyes. What size beads and what dye do *you* want?

Flow Cytometry Microspheres
For years we have been selling plain beads which are used to make flow standards. Now we are expanding our line and offering plain or dyed beads which you may use in this application now. What do *you* need?

Chloromethyl-Activated Microspheres
We now offer a *new line* of proven stable, guaranteed reproducible, polymeric microspheres with chloromethyl surface groups for easy coupling to amine groups. One kit maker has them in production now. You can use a standard coupling protocol (just mix protein and microspheres at pH 7.5) or ask about our new improved proprietary protocol. Beads are offered in 100–1000 nm sizes. Please tell us your needs. We're scaling up now!

"What's up (on the web), Doc?"

Our web site is continually being updated (thanks partly to user suggestions), and we have great plans for new stuff. High on the list is to put our TechNotes (see list on last page) up there so you can read and selectively download only what you really need, when you need it. This will save you time and effort (calling, asking, and waiting for fax/mail copies) and it will save us money from faxing, copying, and postage. Also, a few trees will be spared from the papermill.



"IT STARTED WITH JUST THE PARTICLES BEING ACCELERATED, BUT NOW EVERYTHING AROUND HERE HAS SPEEDED UP."

Cartoon reprinted with special permission from Sidney Harris.

Cool Beads from Spring Meetings

Luminex FlowMetrix™ System
A flow cytometry system is used to assay individual cell-sized microspheres dyed with two special red and orange dyes. This was featured at the Oak Ridge Conference in St. Louis, April 10-11. Details in October, 1997 issue of *Clin. Chem.* See also recent paper, "True Multiplexed Analysis by Computer-Enhanced Flow Cytometry," RL McDade, RJ Fulton, *Medical Device & Diagnostic Industry*, April, 1997, or ask the nice folks (*they paid me to say that*) at Luminex (Austin, TX). Tel: 512-219-8020. Fax: 512-258-4173; e-mail: rlmcdade@luminexcorp.com; Web: www.devicelink.com/mddi

Fluorescent Energy Transfer Latex
FETL: Biosite Diagnostics (San Diego) uses pairs of 0.2µm dyed carboxylate-modified beads, where one of the pair (the "donor" dye) is excited with 670nm light and in turn emits light of an intermediate wavelength which can excite the "acceptor" dye in another particle. The acceptor particle emits 760 nm light. Now, imagine that the two different particles are each appropriately coated (via covalent coupling) with, for example, antibodies to two different epitopes on an antigen. If a sample with antigen is mixed with these particles, then a sandwich can occur and the 760 nm emitted light (and antigen) can be measured quantitatively.

They had two posters at the Oak Ridge meeting- "A Fluorescence-Energy-Transfer Detection System for Immunoassays of Biological Samples," and "Point of Care Immunoassay System." Ken Buechler was first author on both papers. You can bet your bippy that they have applied for any possible patents.

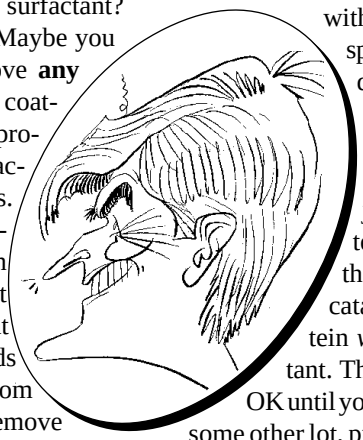
Hurry! June Workshop and Course:
Confocal Imaging, Flow Cytometry & Image Analysis, Jagiellonian University, Krakow, Poland; June 10-13, 1997. BLI is a small sponsor. Web: www.if.uj.edu.pl/~ubdobruc Tel.: (48-12) 34-14-42, ex. 268 (J.Dobrucki). Fax: (48-12) 33-69-07. E-mail: dobrucki@mol.uj.edu.pl

□□□Do you need *accelerated particle* service? We try to anticipate your needs– from speedy response to technical inquiries to fast product delivery.

Ask The Particle Doctor™:

"To Clean or Not to Clean." That is the question.

Q: How do we know when the particles are clean? That is, how do we know we've removed the surfactant?



A: *Simplest answer:* Maybe you don't need to remove **any** surfactant before protein coating, since normally the protein will displace the surfactant from the microspheres.

Almost as easy: Microspheres are clean enough when enough surfactant has been removed so that protein coupling proceeds well. Really, it's not far from the truth. You want to remove surfactant until coupling is uninhibited and reproducible, while the microspheres are singly dispersed. After cleaning, some folks actually add-back surfactant (under their own control) to assist single microsphere coupling.

Technical Answer: It will probably take 10-15 washes to clean magnetic microspheres (lots of fatty acid used in production plus added SDS to assist shelf-stability). Plain microspheres will take fewer washes. It also depends on how the microspheres are washed (continuously, by cross-flow filtration or batch process in a centrifuge) and how much supernatant is removed each time (this is related to how much water is left with the microspheres after each wash).

One can measure surfactant or protein coming off the microspheres with instrumental methods, including surface tension or protein analysis, to see when the wash-water is clean. (Remember that you really need *two* good clean-up methods-one for surfactant removal before protein coating and one for excess protein removal after coating.)

Practical Answer: Dr. Seaman says that water is free of surfactant when the foam or bubbles on top of 5 ml H_2O shaken in a 10 ml test tube collapse in 2-3 seconds. You can use this indicator to test supernatant coming from the microsphere clean-up whether by centrifuge or filter system. We call this the "Seaman Shake Test."

After research work, which might have an involved clean-up process, a real practical system will need to be devised. I always recommend cleaning microspheres rigorously (as by the ion exchange method) at least once in research, to see how the coupling process works with squeaky-clean microspheres. After that you can decide how much to clean and if it makes a difference. Some folks never clean them at all; they just dump in their protein solution and hope for the best ("using prayer as a catalyst"). Usually the protein *will* displace the surfactant. The *prayer method* works OK until you use microspheres from some other lot, process, or manufacturer. Then the new microspheres may have a different kind or amount of surfactant. (For full details, see our new "Washing" TechNote, # 37, listed on p.4.)

Q: How do we know that we have not contaminated the microspheres in the cleaning process?

A: *Possible answer:* Make sure that water going in is as clean as you can get (no ions, no organics, no microbes). Otherwise, microspheres can pick up stuff from the water. Our Barnstead deionized (DI) water system has a mixed ion exchange bed with a conductivity meter, organic filter, recirculating filter system with UV light to kill bugs and a 0.2 μm final filter. It's the best water we know how to make or get, and we use it directly from the system(no stored water for things to grow in). Monitor things with a microscope to ensure that you always have *singly dispersed* microspheres.

New Stuff Related to Microspheres

Purdue University Cytometry Labs

Dr. J. Paul Robinson runs PUCL and produces "Purdue Cytometry", a CD ROM which is *loaded* with information about flow cytometry & confocal microscopy. Web: www.cyto.purdue.edu

Invisible Immunoassays

We know you're out there in the "pharms" industry, designing, building, and running millions of internal immunoassays in support of drug research and development. You're probably testing for primary drug and metabolites in animal models and in clinical trials. Let us help you build a better assay system for your specific needs. We have the *bio-tools* you need (with our "better than" guarantee) and we *can* help ("Been there, done that!"). Anyway our technical support is confidential and free. What can you lose?

Shipping Savings:

DHL & Airborne vs. UPS & FedEx

For the past several months we have been saving our international customers about half of their shipping charges from here. by using DHL for international shipments. We hope that the service is as good or better and the ~50% savings are significant. Tell us how you like their service.

Likewise, Airborne's charges are significantly less for US deliveries. So we use Airborne as our preferred US carrier, but we'll use UPS or FedEx, if you like.

Mail Bonding *(Do the "write" thing!)*

❁ *"I received my copy of "Painless Particles" and the Selection Guide yesterday. Thanks alot. I would like to request [several] technical references. I hope this isn't too much to ask. I will be beginning a new project with microspheres and I feel these will give me a huge leap up the learning curve that I'm facing."* (D Zebert, Seattle, WA) We hope that they help.

❁ *"I always look forward to your newsletter. Not only is it interesting, but I always learn something."* (Anon.) I hope you will always feel that way.

❁ *"I just got [latest] volume of PP. Wow! (I hope I am on your mailing list, permanently?) I am really impressed by what you are doing and wish you much success in the future."* (W. Gleason, Minneapolis) OK You keep buying and we'll keep trying! Thanks for all your mail and kind comments. We appreciate all your feedback.

And tell *all* your friends to visit us at:

www.bangslabs.com

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