Painless Particles®

Global Newsletter
Volume 21, #2, July 2008

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

BEADS ABOVE THE REST™

In This Issue

A Look Back.....1
On The Road Again 1
Mail Bonding 1
Flow Cytometry Standards 2
Seeing (Far) Red.....2
Ask *"The Particle Doctor®"* 3

On The Road Again!

American Association for Clinical Chemistry

July 29 - 31, 2008
Washington, D.C.
Booth 1014
(Hall A Entrance)
www.aacc.org

Mail Bonding

Subscribers Do the "Write" Thing

- *I just contacted your Technical Service Department today with a series of questions regarding glass particles and I want you to know that she did an excellent job of answering my questions, providing references to recommendations she made (that was on her own steam; I didn't even ask for that!), and also pointed me in the direction of products I didn't even realize your company carried. Basically, she provided very fast, very good customer service. Thank you! L.B., NY*

- *Ordered online. Nice product. I got just what I wanted. J.L., NY*

A Look Back...

Where were you twenty years ago on April Fool's Day? What?! You don't remember? E-gads! We do. Well, we don't know where *you* were, but we know exactly where *we* were. In fact, we know exactly what happened on April 1, 1988 – Bangs was born!

Twenty years ago, under the leadership of Leigh Bangs, Bangs Laboratories was founded. The name makes sense now, doesn't it? Founded in Carmel, Indiana, just north of Indianapolis, Dr. Bangs began exploring the big world of tiny microspheres. Recognizing the importance of communicating with his customers right from the beginning, Dr. Bangs also wrote and published the first edition of *Painless Particles®* in December 1988 and our newsletter has been going strong ever since. In fact, you are currently reading our 71st newsletter! I guess when something works, we stick with it.

Several milestones highlight the passage of time and have had major impacts on our company, our products, and you, our valued customers. Outgrowing our facilities in Carmel, in November 1996, we moved to our current location in Fishers. In May 2000, we acquired the Flow Cytometry Standards Corporation and thus began our commitment to the superior flow cytometry products you have come to rely on. Of course, another major change occurred in July 2003 – Bangs was acquired by Polysciences, Inc. As Dr. Bangs stated at the time, "Separately both organizations have grown strong. Imagine what we can now do together." This has certainly proven true as these past few years have witnessed the addition of new staff members, upgraded lab space, and new products, including additions to our BioMag®Plus product line and the launch of ProMag™, not to mention the publishing of our very first printed catalog.

One consistent thread woven throughout our history and continuing into our future is the knowledge that we would not be here without you! Our commitment to provide not only outstanding products, but also unparalleled customer service has never wavered and we will continue to exceed your needs for the next twenty years. In fact, in order to provide you with the most accessible information, we have compiled the questions and answers from *Ask "The Particle Doctor®"* from the last twenty years into one document, complete with a topical index. It's under the *TechNotes* link at **www.bangslabs.com**. What other changes are in store over the next twenty years? You'll just have to stay tuned to find out. And hey, as we celebrate our 20th birthday, we'll even eat a piece of cake in your honor.

Happy 20th Birthday, Bangs!

Flow Cytometry Standards

Amines to an End

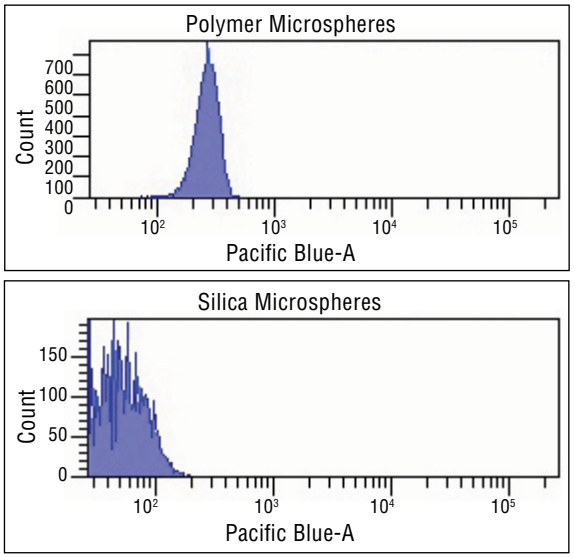
In addition to formulating even more excruciating puns, we have been busy formulating beads for all sorts of tasks in the flow lab. Instrument set-up, linearity checks, compensation – you name it, we're there.

We also offer customizable beads for those times when an off-the-shelf product isn't available, or existing products aren't quite right. In these instances, amine beads can be particularly useful, as they may be easily labeled with reactive fluorophores or other compounds. For UV or violet laser applications, amine-modified silica beads may provide a further advantage, as common polymers exhibit an absorption band in this region (Figure 1).

So, give us a call – whether you need a standard product or something special, we'll use any amines necessary to see you through to a happy ending. (We know, we're groaning too.)

Catalog Code	**Product Description**
SA05N	5µm Silica Amine Microspheres

Figure 1: *Autofluorescence of unlabeled polymer (top) and silica beads (bottom) with 405nm excitation.*



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

Seeing (Far) Red

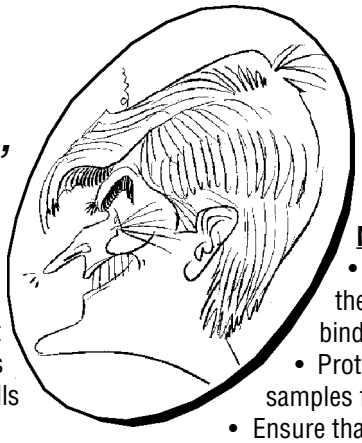
As much fun as it's been to reminisce about the past 20 years (check out our *Particle Doctor®* retrospective online), we are happy to be looking ahead to a bright future. So far ahead, in fact, that we're talking far red. And so bright... well, we're talking really bright.

But enough preamble. Enough nail-biting suspense. What does 2008-and-beyond hold for Bangs? More terrifying 80s hair and fashion? Further mastery of the vile pun?

Even better. For starters, we're pleased to announce our newest fluorophore, Far-Out Red. Oh yes, a brilliant far-red fluorophore boasting red excitation and red / far-red (APC, APC-Cy™7) emission, which we expect to stir hearts and titillate sensors in the flow cytometry and microscopy communities, alike. Far-Out Red beads may be used as relative fluorescence intensity standards, incorporated into comprehensive programs for instrument standardization and QC, or whatever else you can dream up. Far-Out, indeed.

Catalog Code	**Product Description**
913	Far-Out Red Reference Standard

Ask *"The Particle Doctor®"*



Q: I purchased your Quantum™ Simply Cellular® beads to evaluate surface marker expression. However, I'm new to this product and flow cytometry in general, and am a bit nervous about performing these analyses. Can you offer any tips beyond the standard protocol? Any common pitfalls I should avoid?

A: First, let us say: Welcome to Flow Cytometry! We like it, and we're sure that (if not immediately, then in time) you will, too.

If your institution has a core flow cytometry facility, you're in luck, as you'll have access to experts in sample handling, instrument operation, etc. Quantum™ Simply Cellular® products are somewhat specialized and do presume a basic proficiency in these techniques, much of which will translate to the use of antibody capture beads.

However, if you're own your own (and even if you're not), we wouldn't think of abandoning you! We are happy to provide you with additional suggestions up front, as well as troubleshooting tips in case things don't go quite as planned.

Getting started:

- Conduct an antibody titration for the beads so that you're confident that saturation is being achieved. (Bear in mind that the antibody concentration used for cells may not be optimal for the beads.)
- Stain and run each antibody-coated population (Beads 1-4) separately for at least the first run to ensure satisfactory labeling and optimal resolution for gating.
- Use the same lot of the same Ab clone for the duration of the study. Where a new lot must be used, run bead samples stained with each lot in parallel to identify any variation in staining.
- Using a fluorescent bead standard with each run can help in identifying one-off sample preparation problems, etc. For example, use of a suitable Fluorescent Reference Standard would provide a reference point for each run.
- Get to know your instrument. Quantitative fluorescence analyses probably won't be accurate or reproducible if there are problems with instrument linearity, resolution, etc.

And, of course, we've seen our share of troubles over the years. These are often the result of sub-optimal conditions or basic errors, sometimes even of the forehead-smacking variety. (Don't worry, we've done them, too....) And, if error isn't to blame, there are often simple strategies to improve results.

No or poor fluorescence:

- Ensure that the primary mAb species is suitable for the kit. For example, the anti-Mouse kit is intended to bind mouse mAbs, not for the analysis of mouse cells.
- Protect the fluorochrome-conjugated Ab and stained samples from light to prevent photobleaching.
- Ensure that the laser and detector are suitable for the reporter fluorochrome.
- In the special case of Fc-tagged proteins, they should be tested to ensure acceptable binding to the Fc-specific antibody coated on the beads. We have known some Fc tags to exhibit different binding than their native Ab counterparts, and a lack of binding in rare instances.

Broad fluorescence peaks:

- Use of an indirect staining approach will lead to broader peaks; if this occurs, populations may be stained and run separately for optimal gating.
- Broad peaks may indicate that saturation has not been achieved; an antibody titration will aid in ensuring that bead samples are stained to saturation.
- Ensure that only singlets are gated.
- Do not stain the blank population, which consists of uncoated polymer beads that will be happy to bind antibody nonspecifically.

QuickCal®:

- If the curve doesn't fit in the window, it's likely that the wrong version of the template has been used. To determine "resolution," or the appropriate version of the template, look at the x-axis of the fluorescence histogram. Typically, numbering of 0 - 1000 = 1024 template; 10^0 - 10^4 = BD Relative Linear; 10^{-1} - 10^3 = Coulter Relative Linear.
- An unexpectedly high detection threshold may indicate free dye in the system, or that the blank bead population was stained with the antibody-coated beads.

If you achieve poor results with a particular run, stain and run a new sample. Staining and running peaks separately may provide more specific information for troubleshooting. Labeling beads with a different antibody (clone and fluorophore) will aid in identifying clone- or fluorochrome-specific effects.

And, of course, we're happy to offer additional comments, support, or a warm shoulder, if needed.

Bangs Laboratories, Inc.
9025 Technology Dr. • Fishers, IN 46038-2886
Address Service Requested

"Growing old is mandatory; growing up is optional." – Chili Davis

Painless Particles

In This Issue

A Look Back..... 1
On the Road Again! 1
Mail Bonding 1
Flow Cytometry Standards: Amines to an End..... 2
Seeing (Far) Red..... 2
Ask *"The Particle Doctor®"* 3

Bangs Laboratories, Inc.
A DIVISION OF POLYSCIENCES, INC.
BEADS • ABOVE THE REST™