PolyFacts
Vol. 7 | No. 1 Microspheres/Particles

News | Views | Insights *from*

Polysciences, Inc.
Chemistry beyond the ordinary

Setting the Standard

For Instrument QC & Standardization

The analytical instruments so important to life sciences demand the implementation of comprehensive quality assurance programs. Initial validation and routine QC are essential for achieving accurate and consistent results within a study, and generating comparable data between instruments and laboratories. At Polysciences, we manufacture an entire portfolio of microsphere-based standards to support validation, QC and harmonization programs for all sorts of analytical instruments and the operations that rely on them.

We offer dedicated standards for cell analyzers, particle sizers, flow cytometers and fluorescence microscopes, in addition to microspheres for the standardization of related procedures. Our **NIST Traceable Particle Size Standards** feature low coefficients of variation, ensuring suitability for applications extending well beyond instrument calibration, such as particulate testing, filter challenge and clean room validation. Our catalog also includes **SureCount™** standards, **ViaCheck™ Cell Viability and Concentration Controls** and a broad range of **fluorescent** and **antibody capture beads** for flow cytometric and imaging applications. As for our new **StarLight™ Calibration Slides**? Don't even get us started....

Anyway, you get the point. When it comes to instrument validation and programs for QC and standardization... suffice it to say that we've got your back.

Cat. No.	Description
64004 – 64028	**NIST Traceable Size Standards: NANOBEADS (40 - 950nm)**
64030 – 64120	**NIST Traceable Size Standards: MICROBEADS (1.0 - 9.0µm)**
64130 – 64235	**NIST Traceable Size Standards: MEGABEADS (10.0 - 175.0µm)**
25441 – 25445	**StarLight™ Calibration Slides**
25379 – 25382	**SureCount™ Particle Count Standards (3µm, 5µm, 10µm, 15µm)**
24622 – 24626	**ViaCheck™ Viability Controls**
24627 – 24629	**ViaCheck™ Concentration Controls**

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The Latex Course™ 2012!

The 19th offering of **The Latex Course™ 2012** will be held at **The Ritz Carlton** in **Chicago, Illinois,** from **September 16 – 18, 2012**. The program details have been finalized and registration forms are now available!

Up-to-date information can be found on Bangs' website **(www.bangslabs.com/service/latex_course)**, so register today and join us in Chicago!

New StarLight™ Calibration Slides

For the well-appointed lab...

It's summertime, which means that it's time to throw open the curtains, let some light in and rejuvenate the workspace (where, as dedicated scientists, we do spend a great deal of our waking hours…!) Whether this means full-on redecorating, or simply finding that special piece to accent your laboratory space, may we suggest our new **StarLight™ Calibration Slides**? StarLight™ feature vibrant ~6µm fluorescent microspheres paired with the sleek and contemporary styling of a glass slide mounting. And we don't need to tell you how fluorescence makes a room (or at least the field of view) pop! Truly, they are nothing short of stunning. And, not only are they easy on the eyes — we've found them to be pretty useful for basic imaging checks and calibrations for fluorescence microscopes, too.

We offer four standard versions that are appropriate for use with common microscope filter sets: **Glacial Blue** (360, 450), **Dragon Green** (480, 520), **Envy Green** (525, 565) and **Flash Red** (660, 690); StarLight™ slides are available individually or as the StarLight™ Collection (one slide of each fluorophore).

We also have hundreds of different types and sizes of microspheres and a range of mounting media if you require something different, or are a committed DIY-er (do-it-yourselfer for those less familiar with HGTV). In particular, see our **Fluoresbrite®** microspheres and TDS #432, *Coverslipping and Mounting Medium*.

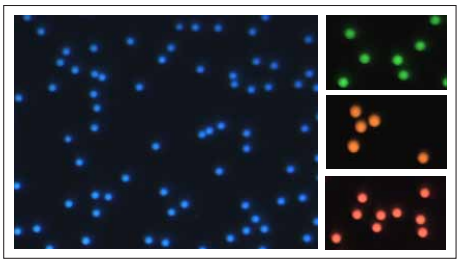

Figure 1: *Images of StarLight™ Calibration Slides. The left image is Glacial Blue. The right images are (from top to bottom) Dragon Green, Envy Green and Flash Red.*

Cat. No.	Description
25441	**StarLight™ Calibration Slide – Glacial Blue**
25442	**StarLight™ Calibration Slide – Dragon Green**
25443	**StarLight™ Calibration Slide – Envy Green**
25444	**StarLight™ Calibration Slide – Flash Red**
25445	**StarLight™ Collection – Slide 4-Pack**

Introducing Biodegradable...

...PLGA Microspheres

Poly(lactic-co-glycolic acid) (PLGA) is a common biodegradable polymer that has been utilized in the development of biocompatible devices such as sutures, tissue scaffolds and drug delivery vehicles, and to generate specific features on biosensor surfaces and within imaging phantoms. Compositions may be engineered to achieve desired degradation or release profiles, and sizes tailored to fit specific applications.

We are pleased to announce the availability of microspheres comprised of two standard PLGA polymer ratios (50:50 and 75:25 Lactic Acid:Glycolic Acid) in three narrow sizes (75µm, 100µm and 120µm; 5-10% CVs). These highly uniform particle populations serve as excellent models for controlled degradation rate measurements, and for the development of prototype scaffolds or devices.

Cat. No.	Description
25401	**PLGA Uniform Dry Microspheres, 50:50 LA/GA, 75µm**
25402	**PLGA Uniform Dry Microspheres, 50:50 LA/GA, 100µm**
25403	**PLGA Uniform Dry Microspheres, 50:50 LA/GA, 120µm**
25398	**PLGA Uniform Dry Microspheres, 75:25 LA/GA, 75µm**
25399	**PLGA Uniform Dry Microspheres, 75:25 LA/GA, 100µm**
25400	**PLGA Uniform Dry Microspheres, 75:25 LA/GA, 120µm**

Particle Perplexities

Questions & Answers Pertaining to Polysciences' Microspheres / Particles

Q: We've attempted to coat antibody onto 1µm carboxylated beads, but have achieved only low activity. What are we doing wrong?

A: There will be points of optimization throughout every protocol, however, there are some usual suspects when it comes to coating failures. The most common issues typically involve bead pre-washes, reagent (EDAC) quality, or the amount of protein used. As a first step, microspheres should be washed to remove surfactant and any other residuals from synthesis that could interfere with the coating. In particular, surfactant associates with the bead surface, and can hinder binding of the ligand. We generally suggest 3X prewashes to prepare the bead surface and normalize the buffer system, e.g. 2X in additive-free wash buffer (e.g. PBS), and 1X in the activation / coupling buffer (e.g. MES).

The EDAC reagent should always be visually examined before use. EDAC is extremely hygroscopic, and the presence of persistent clumps would indicate moisture exposure and accompanying loss of activity. If you've had the EDAC for some time, you might consider using a fresh vial, regardless, and certainly for important coatings (commercial reagent) or if the ligand is scarce or expensive. EDAC is inexpensive, and simply replacing it may save valuable time and antibody. For convenience, we now sell this and other accessory reagents as stand-alone products (Cat. BLI5288, **DEPC-Carbodiimide [EDAC]**; see TDS #911, *Accessory Reagents)*.

Low activity may also speak to insufficient antibody, and improving the outcome of the coating may be as simple as increasing protein concentration. If you're unsure as to a suitable amount, you might begin by following the protocol for our **PolyLink Protein Coupling Kit** (Cat. 24350, TDS #644), and optimizing from there.

Of course, these are just some of the most common culprits, and buffer compositions / pH ranges, incubation times, mixing steps, etc. should also be reviewed.

Cat. No.	Description
BLI5288	**DEPC-Carbodiimide (EDAC)**
24350	**PolyLink Protein Coupling Kit**

Q: When I mount cells that contain Fluoresbrite® fluorescent microspheres, the fluorescence disappears. What can I do to fix this?

A: **Fluoresbrite®** microspheres are polystyrene-based spheres that are internally labeled with fluorophore. If you're confident that beads are present, but the fluorescence disappears with mounting, I suspect that your mounting medium contains an organic solvent, e.g. xylene, formaldehyde, etc. Organic solvents will swell or dissolve the polystyrene bead matrix, releasing dye to the surrounding environment and resulting in significantly diminished or nonexistent fluorescent signal. Fortunately, there are alternate mounting media that are compatible with polymer microspheres. For example, **Aqua-Poly/Mount** (Cat. 18606; TDS #521) and **Mowiol® 4-88** (Cat. 17951; TDS #777) have been used successfully with fluorescent polymer microspheres. Additional options can be found in TDS #432, *Coverslipping and Mounting Medium*.

Cat. No.	Description
18606	**Aqua-Poly/Mount**
17951	**Mowiol® 4-88**

Q: We are users of your NIST Traceable Size Standards, and we now have a need for NIST Traceable Count Standards. I see different types of count standards in your catalog, however, I'm not sure what would meet our traceability requirements.

A: We do offer a number of size and concentration standards, including **SureCount™ Particle Count Standards**, which may be a good fit. SureCount™ standards are actually NIST Traceable Size Standards (traceable to NIST Reference Materials) that are suspended at a precise concentration (1e+6 beads / ml).

We are not able to offer NIST traceability on the particle count as NIST does not offer a suitable Reference Material. However, counts are determined in-house using our stringent process, which involves extensive evaluations on validated particle counters. We run a variety of standards in the routine QC of our counters, including others that we manufacture, such as **ViaCheck™** controls and our **Flow Cytometry Absolute Count Standard** (the latter of which has had counts verified by an independent laboratory), as well as another commercial concentration control.

Cat. No.	Description
25379 - 25382	**SureCount™ Particle Count Standards – 3µm, 5µm, 10µm or 15µm**
24622	**ViaCheck™ 0% Viability Control**
24623	**ViaCheck™ 50% Viability Control**
24624	**ViaCheck™ 75% Viability Control**
24625	**ViaCheck™ 90% Viability Control**
24626	**ViaCheck™ 100% Viability Control**
24627	**ViaCheck™ Concentration Control – 1 x 10^6**
24628	**ViaCheck™ Concentration Control – 4 x 10^6**
24629	**ViaCheck™ Concentration Control – 8 x 10^6**
BLI580	**Flow Cytometry Absolute Count Standard™**

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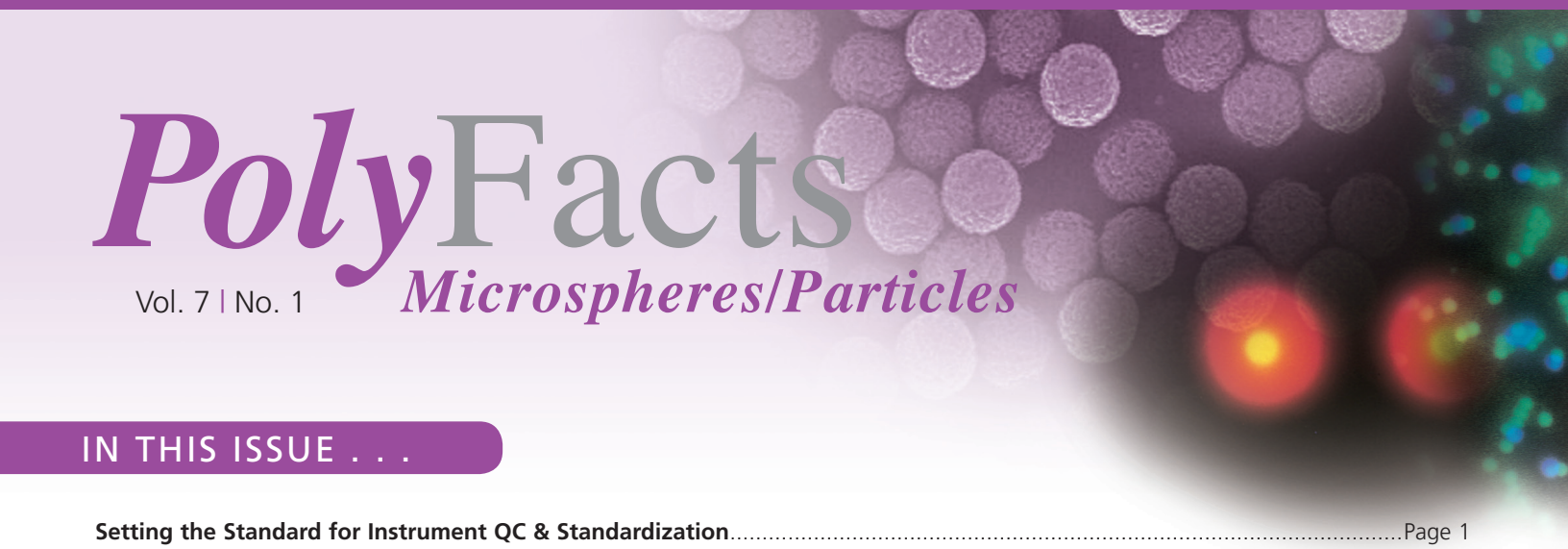

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