



The New Way to MULTIPLEX:

7 Ways to Get to the Answer Faster

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ADVANCING LIFE SCIENCE TOGETHER™
Research. Development. Production.



IMPROVING THE TOOLS THAT UNRAVEL THE MYSTERIES OF DISEASE.

Multiplexing has fundamentally redefined how scientists can work faster to understand and impact disease. But, faster does not always mean better. Speed without quality can be risky. And slowing down to ensure better quality can result in missed deadlines—and missed opportunities.

Recently, a group of thought leaders assembled to solve the challenge, believing that there must be a better way to satisfy both needs. From their quest an entirely new approach to multiplexing has emerged, creating a new solution that holds more promise than ever before to accelerate the pace of discovery and development. Who are these thought leaders, and how does their influence continue to shape the industry? To get to the answer, we need to start at the very beginning...

THE RISE OF MULTIPLEXING.

The first revolution in biomarker detection was the development of ELISAs in the 1970s. At the time, it was a revolution for drug developers. But with the growing need for ever-greater speed, many scientists wanted to measure more than one analyte at a time (without the need for a significant sample volume).

Protein multiplexing was the answer, and the Luminex® Corporation revolutionized the approach by using microspheres as the support for conventional biomarker immunoassays. Suddenly, developers could quantitate multiple analytes in a single, low-volume sample (in fact, up to 100 analytes in a single well). That meant faster results—for example, faster 'go/no-go' decisions for drug candidates.

Two pioneering companies worked with Luminex to lead the way: Linco® and Upstate®. Both were instrumental in validating the Luminex technology. In 1999, both companies separately created some of the first multiplexing kits to take advantage of the emerging Luminex technology that would help scientists advance their work.

Fast-forward nearly 10 years, and the advancements continue. In fact, they're accelerating as the original thought leaders—Linco and Upstate now, Millipore—have joined together, creating a new, single resource for the best new thinking in multiplexing. Even better together than they were alone, these thought leaders have created a new way for scientists to juggle the often conflicting goals of speed and quality. How did they do it? By identifying and transforming seven difficult issues into seven strategies for success. And then tying them all together into one, easy-to-use product.

Here's a closer look at the seven issues, followed by the Millipore strategy for solving each.

SEVEN STRATEGIES TO IMPROVE MULTIPLEXING.

1. The need for more speed.

Who could argue that the pace of research and development seems to quicken by the day. The faster scientists work, the higher the bar is set. Once the value of biomarkers was confirmed, the pressure was on for multiple—not single—detection. Today, scientists need better ways to quantitate as many analytes as possible from a single, low-volume sample. It's about finding better multiplexing tools that save more time, and therefore more money. But, speed isn't the only issue...

2. Without quality, speed has little value.

Every assay should meet stringent criteria for sensitivity, reproducibility and specificity. That's why manufacturers should adopt established and proven quality control measures, such as Six Sigma.

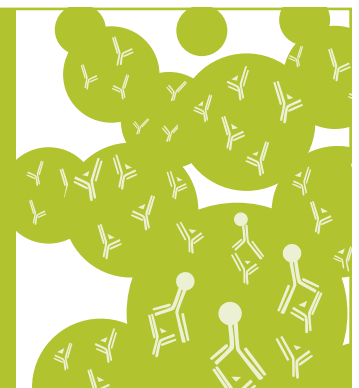
3. Too many catalog numbers.

It sounds easy, but so often isn't: having all the assay tools you need in hand before you start working. A single missing element can make the difference between getting started—or ordering from the catalog (again) and delaying your work. Wouldn't a single kit, with a single catalog number, be simpler?

"Millipore's scientists were multiplexing from day one. Years later, they're breaking new ground, again. MILLIPLEX MAP holds great promise for advancing our work."

Imran Khan, Ph.D.

Associate Director, Clinical Proteomics Core
Dept. of Pathology and Laboratory Medicine
University of California at Davis



4. Make it more efficient.

Plato reminds us that 'necessity is the mother of invention.' Here, the road to 'invention' starts with improving efficiency. And that need is growing. Around the world, scientists are searching for better ways to achieve quality results faster. To be more efficient, you need more reliable tools that perform consistently.

5. Be more flexible.

In a perfect world, scientists would be able to customize the analytes within a panel, choosing only the ones that meet their precise needs. But instead, manufacturers often make the choices for them, and scientists have to compromise. Surely, there's a better way.

6. Missing the big picture.

Speed... quality... efficiency... flexibility... cost. All critical factors that, ideally, work together to advance science. But when approached in isolation—instead of holistically—mistakes can happen, and opportunities can be lost. The multiplexing community needs a common solution that addresses these factors collectively, not individually.

7. Continuity of knowledge is the key.

Until Millipore, there hasn't been a single multiplexing solution built to solve all of these issues simultaneously. One that ensures continuity of knowledge by literally 'owning' every step of the process—and ensuring nothing slips through the cracks. Building every component organically, and outsourcing nothing. R&D? In-house. Manufacturing? In-house. And every step in between.

THE MILLIPORE STRATEGY.

Millipore is the first to offer a combined solution for all seven issues. The new product, called MILLIPLEX™ MAP, was born by merging the best advantages of LINCoplex® and Beadlyte®, two legacy product lines. The flagship product lines of Linco and Upstate respectively, these two Luminex pioneers are now available as one.

Why did Millipore combine the two? Quite simply, Millipore understands that scientists need the best tools and technologies to do their best work. That's why Millipore acquired Linco and Upstate, the industry's preeminent brands, in the first place. Their best-in-class products—LINCoplex from Linco and Beadlyte from Upstate—are the ideal launching point for an entirely new approach in multiplexing. Truly bringing together in one place—and for the first time—the best and latest thinking from the world's first multiplex leaders. All directed toward solving the issues that matter most:

1. Work faster:

By making multiplexing easier. Here are just a few examples:

- Optimized bead formulation
- Bead vials for easier pipetting
- Serum diluent included with kit
- Colored caps to distinguish reagents
- White opaque plate and cover — visualize reagents and block light without the need for aluminum foil
- Environmentally friendly packaging

2. Higher quality:

Industry-leading quality control and assurance as well as process improvements using Six Sigma principles and measures.

3. More efficient:

Featuring a more user-friendly protocol template and validated panels for consistency and reproducibility:

- Standardized and fixed ranges
- Consistent profiles, regardless of plex size
- Consistent analyte performance
- Lot-to-lot consistency

4. All-in-one:

A single, comprehensive kit, with a single catalog number.

5. More flexible:

Fully customizable analytes within each validated panel (pre-mixed panels and bulk packaging are available as well).

6. Better thinking:

MILLIPLEX MAP is the product of more than 25 years of thought leadership in immunoassay development for RIAs and ELISAs. We were there in the beginning, helping to validate Luminex as the Gold Standard. Now, we have pushed the frontiers even further, combining the talents of the leading multiplex pioneers with the deep life sciences resources and commitment of Millipore. Our goal is to continually create new and better tools to help you advance your work. MILLIPLEX MAP is an important first step. And it's just the beginning.

7. Continuity of knowledge:

Millipore was built to provide the first-ever, end-to-end workflow solution for discovery and development. All of the multiplexing products and services you need are right here, to help you get to the answer faster.

The first two MILLIPLEX™ panels are:

- Human Cytokine Panel (42 analytes)
- Mouse Cytokine Panel (32 analytes)

MORE THAN THE BEST MULTIPLEXING PRODUCTS. A COMPLETE WORKFLOW SOLUTION.

Beyond products alone, we can provide complete assay services all the way through clinical trials. By obtaining all of the products and services you need from a single source, you'll have a continuity of knowledge that's unachievable any other way. The result: better answers, faster. In fact, Millipore's BioPharma Services division is the first to fundamentally redefine the concept of the CRO in eight distinct ways:

1. Scalable scope and resources, helping you see every challenge with greater clarity and simplify every decision as a result
2. R&D and thought leadership built in to every step
3. Speed, with guaranteed reproducibility
4. Optional GLP-level quality
5. Clear cost/benefit advantage (the most quality data for the money)
6. The trust that comes working with an established leader
7. Peer objectivity, to help you validate and commercialize your work faster
8. A new way to look at customer service: not just delivering products and services, but advancing our mutual work, together

For more information, ask your Millipore sales representative.

ARE YOU A CURRENT LINCOp^{lex}® OR BEADLYTE® USER?

Rest assured we'll provide the support you need to transition as smoothly as possible to the new MILLIplex MAP platform. Count on us to be there for you, helping you use these new and better tools to reach your next milestone faster and even more efficiently.

MILLIplex MAP is a combination of the original and most trusted brands in multiplexing, LINCOp^{lex} and Beadlyte panels.

Joining together for the first time to create a new, even better multiplexing tool. Built to help you work faster, with greater quality. Work smarter, with more efficiency. And get the most quality data for the money. The original thought leaders in multiplexing have pushed the frontier forward, again. And invite you to join us in our quest for better answers to the challenges of today, and tomorrow.

For more information about MILLIplex MAP, please contact your Millipore sales representative, go to www.millipore.com/drugdiscovery or e-mail drugdiscovery@millipore.com.

ABOUT THE AUTHOR:

Ji Shaoquan is the R&D Manager of Millipore's Drug Discovery Bioscience Division. For more than 21 years, Shaoquan has been at the forefront of animal growth biology research and immunoassay development. Before joining Millipore, Shaoquan was the LINCOp^{lex}® Group Leader at LINCO Research, Inc., where he managed one of the original and most trusted brands in multiplexing. Shaoquan has also been a Senior Research Scientist at Purina Mills, Inc. He received his DVM from Yangzhou University, China and Ph.D. from Purdue University.

ABOUT MILLIPORE:

Millipore is a global life sciences community of best-in-class products, services and partnerships. Coming together for the first time—all in one place—with one common goal: to help scientists advance their work in new and unexpected ways. MILLIplex MAP is a classic example of how we advance, together.



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