

xMAP® Technology Fact Sheet

Bead-Based Multiplexing of up to 500 Bioassays per Well

Open-architecture xMAP® Technology enables multiplexing of biological tests (assays), reducing time, labor, and costs over traditional methods. Systems using xMAP Technology perform discrete assays on the surface of color-coded beads known as microspheres, which are then read in a compact analyzer. Using multiple lasers or LEDs and high-speed digital-signal processors, the analyzer reads multiplex assay results by reporting the reactions occurring on each individual microsphere particle.

Benefits of xMAP Technology include:

- Test for more biomarkers
- Use less sample than other methods
- Save time and money
- Trust data from >28,000 publications

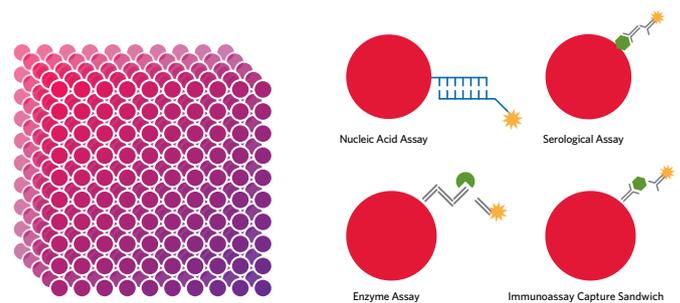
How xMAP® Technology Works

Luminex uses proprietary techniques to internally color-code microspheres with various fluorescent dyes. Through precise concentrations of these dyes, 500 distinctly colored bead sets are created, each of which can be coupled with a reagent specific to a particular bioassay. Reagents may include antigens, antibodies, oligonucleotides or enzyme substrates. After an analyte from a test sample is captured by the bead, a reporter molecule, labeled with a different fluorescent dye, is introduced to complete the reaction on the surface of each microsphere.

Next, the microsphere's internal dyes are excited by the laser or LED identifying the microsphere set and thus identifying the marker of interest. A second laser or LED excites the fluorescent dye on the reporter molecule. Finally, high-speed digital-signal processors identify each individual microsphere and quantify the result of its bioassay based on fluorescent reporter signals. Magnetic beads are available, which allows them to be separated from solution quickly and easily with the use of a magnetic separator; improving recovery during handling and wash steps, and facilitating assay automation.

A Better Alternative to Other Assay Technologies

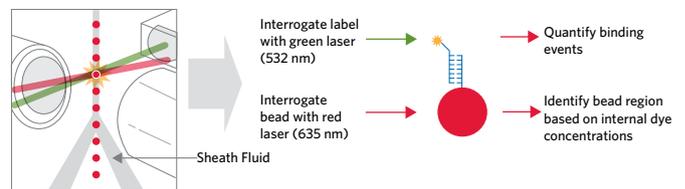
Luminex xMAP Technology offers the versatility to perform a wide range of multiplexing assays from proteins to nucleic acids on a single platform, while other technologies often specialize in either DNA or protein analysis using a variety of technology platforms.



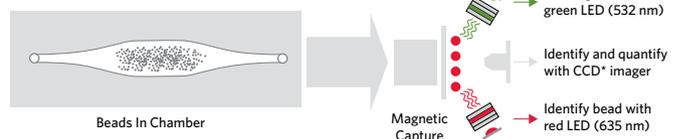
Luminex internally color-codes microspheres with precise concentrations of various fluorescent dyes yielding 500 distinctly colored bead sets.

The microspheres can be coupled with reagents specific to a particular bioassay, such as antigens, antibodies, oligonucleotides or enzyme substrates.

Laser-Based Analysis



LED/Image-Based Analysis



*Charged Coupled Device

The microspheres pass through a red laser or LED, which excites the internal dyes to distinguish the microsphere set. Then a green laser or LED, which excites the fluorescent dye on the reporter molecule, determines the result of the assay.

Advantages of the xMAP® Technology Platform

Speed/High-Throughput — Because each microsphere serves as an individual test, a large number of different bioassays can be performed and analyzed simultaneously with limited sample

Versatility — A single xMAP Technology-based system can perform bioassays in several different applications, including nucleic acids, antigen-antibody binding, enzyme, receptor-ligand, and other protein interactions

Accuracy — xMAP Technology generates real-time analysis and accurate quantification of the biological interactions as the biomarkers are all read in a single sample

Flexibility — A large number of kits are available from more than 70 partners and the technology can be customized for the user's specific needs, or updated periodically by attaching a specific capture molecule to a uniquely colored microsphere

Reproducibility — High-volume production of xMAP microspheres within a single lot allows assay standardization and optional multiple quality control (QC) steps during assay production that solid-phased flat arrays cannot provide

Trusted — Over 28,000 publications from your scientific peers covering a wide variety of research areas

The following are examples of applications for xMAP® Technology:

Drug Discovery/Genomics

- Detecting single nucleotide polymorphisms (SNPs) for pharmacogenomic applications
- Expression analysis with transcriptional profiling

Drug Discovery/Proteomics

- High-throughput screening of potential drug compounds by inhibition of enzymatic targets such as kinases or proteases
- Kinase selectivity screening of drug candidates against multiple common kinases
- Measurement of serum analytes in animal and human clinical trial subjects
- Multianalyte profiling of drug and drug metabolites for purposes of toxicology and drug metabolism studies
- Drug target validation using receptor-ligand analysis

Diagnostics*

- Screening for genetically inherited diseases such as cystic fibrosis
- HLA typing for transplantation
- Multiplexed profiling for autoimmune disease
- Molecular pathogen detection

Basic Research

- Gene expression analysis
- Genotyping
- Protein expression analysis
- Animal-model serum analyte profiling
- Antibody epitope mapping
- Enzyme/substrate research
- Protein-protein interaction analysis



* Examples listed represent available *in vitro* diagnostic (IVD) test kits from Luminex or Luminex partner companies. IVD kits are region specific and may not be approved for clinical use in some countries/regions.

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complexity simplified.

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