



## Overview

Luminex® Corporation (NASDAQ: LMNX) develops, manufactures and markets the innovative xMAP® Technology with applications throughout the life-sciences industry, and clinical diagnostics. Open-architecture xMAP Technology enables multiplexing of biological tests (bioassays) reducing time, labor, and costs over traditional methods.

Systems using xMAP Technology perform discrete bioassays on the surface of color-coded beads known as microspheres, which are then read in a compact analyzer. Using multiple lasers or LED and high-speed digital-signal processors, the analyzer reads multiplex assay results by reporting multiple colors on each individual microsphere particle.

## How xMAP Technology Works

First, Luminex uses proprietary techniques to internally color-code microspheres with various fluorescent dyes. Through precise concentrations of these dyes, up to 500 distinctly colored bead sets can be created, each of which can be coupled with a reagent specific to a particular bioassay. Reagents may include antigens, antibodies, oligonucleotides, enzyme substrates, or receptors. 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 microspheres internal dyes are excited by the laser or LED, marking the microsphere set. 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.

## Market and Competitive Landscape

While other companies often specialize in either only DNA or protein analysis using different technology platforms, Luminex offers versatility to perform a wide range of multiplexing assays from proteins to nucleic acids all on one platform.

The advantages of the xMAP® Technology platform include:

- **Speed/High-Throughput** — Because each microsphere serves as an individual test, a large number of different bioassays can be performed and analyzed simultaneously
- **Versatility** — A single xMAP Technology-based system can perform bioassays in several different applications, including nucleic acids and antigen-antibody binding, along with enzyme, receptor-ligand and other protein interactions
- **Flexibility** — xMAP Technology can be customized for the user's specific needs or updated periodically by attaching a specific probe to a uniquely colored microsphere
- **Accuracy** — xMAP Technology generates real-time analysis and accurate quantification of the biological interactions
- **Reproducibility** — High-volume production of xMAP microspheres within a single lot allows assay standardization that solid-phased flat arrays cannot provide

## Applications

The following are a few 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
- Serological screening for infectious diseases such as hepatitis
- Multi-analyte profiling of hormone levels
- HLA typing for transplantation
- Multiplexed autoimmune and allergy testing

## Basic Research

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



MAGPIX® System



Luminex® 100/200™ System



FLEXMAP 3D® System

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