

BEACON SCIENCES

Putting specialized binding assays to work for you

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Lock-and-Key Chemistry: No Need for Antibodies or Enzymes

While many biochemical assays require proteins, antibodies, or enzymes, Beacon Sciences uses a custom lock-and-key recognition chemistry combined with chemiluminescence to



Let us solve your analytical assay needs with:

- Rapid, selective, novel binding chemistries
- Disposable, single-use tests and reagents
- Highly adaptable, real-time visible outputs
- Reduced costs - no need for antibodies

develop highly specific, stable, and inexpensive binding assays for a wide range of analytes.

Beacon's rapid development time, high sensitivity, ease-of-use, and low costs meet the needs of many markets, including Environmental, Life Science Research, In Vitro Diagnostics, and Biodefense testing.

The Beacon Sciences Difference

Building on the pioneering work in supramolecular recognition by Dr. Eric Anslyn, Beacon Sciences creates entirely synthetic molecular pockets that selectively bind a target molecule.

By embedding this pocket with a weakly-held fluorescent chromophore, this enables a displacement reaction to occur in the presence of the target molecule.

Using the process of chemiluminescence, the displaced chromophore provides an optical signal that a binding event has occurred. This unique approach



Chemiluminescence At Work

Beacon Sciences has combined our novel molecular recognition techniques with the power of chemiluminescence to deliver custom, rapid, cost-effective assays. Chemiluminescence is a highly sensitive detection method in which the presence of an analyte triggers a chemical reaction that produces light. Beacon Sciences engineers indicator displacement reactions using lock-and-key chemistry so that binding of the target analyte releases a key chemical reactant needed for a chemiluminescent reaction. Therefore, binding of an analyte causes the emission of light from the sample reaction.

simplifies the assay procedures by avoiding the need for costly antibodies or proteins, secondary labeling or chemical reactions, or complicated instrumentation.

Your Custom Assay Development Experts

Let Beacon Sciences solve your analytical assay needs. Our supramolecular recognition techniques enable highly selective, sensitive binding assays for a wide variety of analytes. Use Beacon Sciences assays as a stand-alone format or use them to enhance the quality and sensitivity of existing assay technologies and platforms.

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Beacon Sciences' antibody- and enzyme-free tests are well suited to point-of-care and field-based testing applications, including:

- ▶ Environmental & Industrial – water purity, chemical spills, trace element and compound toxicity
- ▶ Life Science Research – profile-oriented screening, secondary screening, compound manufacturing validation
- ▶ Clinical Diagnostics – genetic disease testing, molecular infectious disease, immunodiagnostics, hormones, oncogenic markers
- ▶ Biodefense – chemical and biothreat agent detection in gas and liquid phase
- ▶ Personal-Care – home tests for pregnancy, fertility, drugs of abuse, food safety, water purity, air quality

Sample Analytes Used in Lock-and Key Assays

SMALL ORGANICS AND BIOCHEMICALS

- Sarin/Soman
- TNT
- Pd(II)
- Butanetetracarboxylate
- RDX
- HMX
- Ketone Bodies
- Chiral alcohols, carboxylic acids
- Sugars, sweeteners
- Hydrogen sulfide
- Various amino acids
- 2,3-BPG
- Phosphate
- IP3
- ATP
- Nitrate

LARGE ORGANICS AND BIOCHEMICALS

- Cell surface oligosaccharides
- Phosphorylated proteins
- Short to long peptides
- Phosphorylated sugars
- Heparin

Market Opportunity

With applications in environmental, life science research, clinical diagnostics, and biodefense, Beacon Sciences has a



combined market opportunity of over \$20 billion. Key opportunities exist in molecular reagent kits production and rapid biodefense tests for nerve agents and other biothreat agents.

Business Model

Beacon Sciences seeks strategic co-development partnerships with leading assay providers and biomarker discovery companies. Co-development projects usually begin with a feasibility agreement to develop a customer-specific solution. Successful feasibility studies may lead to development and licensing agreements. Such agreements typically include development fees, milestone and licensing payments, and royalties based on sales of products by our partners. Beacon Sciences can provide small scale supplies of materials for pilot studies.

Management Services

Beacon Sciences' management services are provided by Emergent Technologies, Inc. (ETI). ETI, founded in 1989 by Thomas A. Harlan, is a life sciences venture capital firm that specializes in forming, funding, commercializing, and managing companies for the purpose of converting institutional and university-based technology into high return ventures.



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