



Life Science Research

Summary Bio-Rad's Life Science Group develops, manufactures, and markets a wide range of laboratory instruments, apparatus, and consumables used for research in functional genomics, proteomics, and food safety. The group ranks among the top five life science companies worldwide. The company's life science products are based on technologies used to separate, purify, analyze, identify, and amplify biological materials such as proteins and nucleic acids. These technologies include electrophoresis, imaging, multiplex immunoassay, chromatography, microbiology, bioinformatics, protein function analysis, transfection, amplification, and real-time and droplet digital PCR.

Customers The Life Science Group's customer base includes universities, research institutions, pharmaceutical, and biotechnology companies as well as private research firms. Bio-Rad products support researchers in laboratories around the world.

Products **Protein Purification and Analysis**
From sample preparation to characterization and identification, Bio-Rad provides choices in methodologies, protocols, and products for protein purification and analysis. Bio-Rad offers a variety of products for protein sample preparation and assessment to help researchers achieve the best results possible.

Gene Expression Analysis

Bio-Rad offers choices in methodologies, protocols, and products to accommodate a variety of gene expression analysis workflows, from sample preparation to profiling and quantitation.

Some of Bio-Rad's innovative products for use in the areas of biological research and testing include:

The ProteOn™ XPR36 Protein Interaction Array System — Based on surface plasmon resonance technology, the ProteOn XPR36 protein interaction array system is an optical biosensor that uses image analysis to simultaneously track optical changes at many different sites in an image (array) enabling the measurement of up to 36 interactions at a time. The ProteOn XPR36 system offers speed, accuracy, and ease-of-use, as well as a complete package of instruments, kits, reagents, software, support, and training.

Mini-PROTEAN® TGX™ Precast Gels — Bio-Rad's Mini-PROTEAN TGX (Tris/Glycine eXtended) precast gels provide long shelf life and enable fast protein electrophoresis run times using the standard Laemmli buffer system. Mini-PROTEAN TGX precast gels are based on a modification of the Laemmli buffer system that significantly increases gel matrix stability and performance over time. This modification extends the gel shelf life to more than 12 months and offers consistent superior resolution and reproducibility while delivering unprecedented electrophoresis run speeds.

Mini-PROTEAN TGX gels can be run to completion in as little as 12 minutes, which is significantly less time than any other PAGE system using precast or handcast gels.

Bio-Plex® Suspension Array System — This rapidly growing product line is designed to provide a complete solution for multiplexed fluorescent immunoassays and help to accelerate the understanding of protein expression analysis. The Bio-Plex platform enables researchers to extract more information faster and from smaller samples. The system extends Bio-Rad's strengths in protein analysis, separation, and identification to new areas of protein arrays. Standardized pathway panels complement user configurable kits for cytokines, phosphoproteins, and other biologically relevant analytes.

1000-Series Thermal Cyclers: Next Generation PCR Instrumentation — The C1000™ and S1000™ thermal cyclers offer a flexible and modular high-end PCR platform with fast, accurate, and reproducible performance. The C1000 thermal cycler incorporates best fea-



Life Science Research

Products (cont)

tures from Bio-Rad's iCycler® and DNA Engine® thermal cycler systems including a large graphical display and fully adjustable lid. The C1000 thermal cycler also includes USB flash drive data storage and the Protocol Autowriter that enables users to automatically write protocols based on their input parameters and the desired reaction speed.

Unlike thermal cyclers from other manufacturers, the C1000 and S1000 thermal cyclers offer multiple reaction block formats including 96-well fast, 384-well, and dual 48-well fast modules that are gradient enabled. Bio-Rad is the only manufacturer to offer a gradient-enabled dual

block. Additionally, the C1000 cycler can be upgraded to a real-time PCR system with the CFX96™ reaction module.

The 1000-series cyclers offer technology to help scientists achieve faster results. In addition, the 1000-series cyclers are easily integrated into existing workflows and have multiple user-focused features such as easy-to-use software, PC compatibility, single-run optimization with thermal gradient, automatic programming, multiple connectivity options, and online training and tools.

Partners

Bio-Rad works with a variety of partners to develop novel techniques and technologies. Some examples of these relationships include:

Signal Transduction Analysis and Biomarker Discovery — Bio-Rad has developed a series of highly selective and sensitive Bio-Plex® multiplex assays for phosphoproteins, key players in cancer biology and in other cellular “signal transduction” events caused by protein regulation. Working closely with Cell Signaling Technologies, the worldwide expert in phosphoprotein antibodies, Bio-Rad has introduced more than 30 bead-based assays used to analyze critical cellular pathways for patient stratification studies, drug response studies, and basic and applied clinical research. In addition, Bio-Rad is also working with Cell Signaling Technologies to develop biomarker panels for critical human diseases.

Experion™ Automated Electrophoresis System — Bio-Rad developed the Experion system in collaboration with Caliper Life Sciences. The system was introduced in 2005. The two companies continue to collaborate on new kits, new instruments, and product enhancements.

Strategic Research Initiative — The Strategic Research Initiative is designed to help small companies and academic researchers realize their vision of developing useful analytical tools and supplies by providing expertise, marketing intelligence, and collaborative funding. The Life Science Group invests a portion of its R&D budget in external collaborations and long-term research in laboratory tools. The Strategic Research Initiative has already resulted in more than a dozen academic and industrial partnerships.

Biotechnology Explorer™ Program — Bio-Rad's Biotechnology Explorer™ program brings modern life science techniques and biotechnology experience to high school and college-level students. Through easy-to-use kits suitable for beginner and experienced students, the program provides actual hands-on laboratory experiments for food and genetically modified organism (GMO) testing, gene cloning, crime scene analysis, and other relevant and educational applications. Biotechnology Explorer kits have been developed with a number of leading research institutions along with the help of science educators