From Our Bench To Yours
For over 30 years, Enzo has been providing enabling technologies for the research, development, manufacture, licensing, and marketing of innovative life science and health care products and services based on molecular and cellular technologies.

Our Mission
We strive to develop novel platforms that enable researchers to find better, more reliable solutions throughout the drug development pipeline and clinical research laboratory. Through this journey, we hope not only to connect with our customers, but to enable a future with more hope, more collaboration, and less disease.

Collective Strength
Working with our customers, we create unique solutions focused on the Life Sciences Research, Drug Development, and Clinical Research markets. Through our recent acquisitions of Alexis® Biochemicals, Biomol International, Assay Designs®, and Stressgen® Bioreagents, we have aligned the skills and scientific expertise associated with these industry-established brands. With custom developed solutions and off-the-shelf catalog products, we provide the life sciences market with a unique array of fluorescent probes, dyes, and labeling systems for molecular biology and cellular analysis, as well as a broad range of bioreagents including antibodies, proteins, small molecules, ELISA kits, and enzyme assays.

Global Research
Our strong roots in the life sciences industry extend beyond the laboratory. We understand the importance of delivering product to you quickly and efficiently. Our website, www.enzolifesciences.com, offers our global customers easy access to thousands of unique products with enhanced search functionality and secure online ordering. Our distributor sister site, www.axxora.com, was one of the original e-commerce websites and continues to provide a “one-stop” marketplace for a multitude of products from a variety of suppliers and manufacturers.

Enzo Biochem (NYSE:ENZ)
We are an important segment of our parent company, Enzo Biochem, a vertically integrated clinical lab, life sciences, and therapeutic biotechnology company. We use the technology and knowledge of our sister divisions to support the innovation driving new product platform development. Links to these divisions provide ready access to difficult-to-procure clinical samples, facilitating thorough product validation from concept to market launch. A continual voice from the clinical market keeps us tied to current needs, helping to define our new product pipeline and maximize our R&D efforts.

Our foundation rests in the collective strength of our experience, unique technology platforms and thousands of peer-reviewed literature citations.
YOUR GOAL IS OUR GOAL

Whether your focus is disease research, target identification and validation, process monitoring, or diagnostic test development, our products work for you. Our breadth of scientific expertise coupled with unique technology platforms give us the flexibility to drive innovation throughout the entire research continuum. From life sciences research discovery efforts, through drug development, and into clinical research, our comprehensive range of products are designed to support your goals. When a standard catalog product does not meet your needs, talk to us about custom solutions; we can help.
ENABLING DISEASE RESEARCH

Major disease research programs depend upon pursuit of a comprehensive understanding of the cellular and molecular basis of disease and response to potential therapeutics. Our wide range of technology platforms facilitate analysis at the gene, protein, or cellular level. Our scientific expertise is enhanced by active participation and collaboration with leaders in the areas of molecular biology, proteostasis, and cell biology. We understand the etiology of clinically relevant diseases including cancer, neurodegeneration, autoimmune disease, diabetes, obesity, and more. We support basic discovery in the fields of protein synthesis, folding, degradation, gene expression, cell death pathways, and cellular responses to stress. Our portfolio of over 9,000 assay kits, dyes, labels, small molecules, antibodies, and proteins are reliable, extensively validated, and backed by thousands of publications in peer-reviewed journals.

EXPLORE DISEASE FROM MANY ANGLES

Cancer
- eFlux-ID® Multidrug Resistance Assay
- Stressgen® HSP90 ELISA Kits & Antibodies
- Screen-Well® FDA Approved Drugs, Natural Products & Protease Inhibitor Libraries
- HDMC & Sirtuin Activity Assays
- Nuclear-ID® Cell Cycle Assays
- aCDH Labeling Kits
- Screen-Well® Wnt Pathway Library & Wnt Proteins
- Autophagy Cell Analysis & ELISA Kits

Cardiovascular Disease
- Angiotensin ELISA Kits
- Bradykinin ELISA Kit
- MMP Drug Discovery Assays
- Cyclic GMP ELISA Kits
- Nitric Oxide Detection Assays
- Mitochondrial Activity Kits
- Screen-Well® Wnt Pathway Library & Wnt Proteins

Neurological Disorders
- ProteoStat® Amyloid Plaque Detection Kit
- ProteoStat® Aggresome Detection Kit
- SMN ELISA Kit
- Ubiquitin & Proteasome Detection Kits & Reagents
- Stressgen® HSP70 ELISA Kits & Antibodies
- Cyto-ID® Autophagy Kit

Diabetes & Obesity
- GLP-1 & Exedin-4 Antibodies
- DPPIV/CD26 Activity Assay
- Adipokines
- Insulin Signaling
- PI3K/mTOR/Akt Pathway Kits & Reagents

Endocrine Disorders
- Corticosterone, Testosterone, & Estradiol ELISA Kits
- Oxytocin/Vasopressin ELISA Kits
- Screen-Well® Receptor De-orphaning Libraries

Renal Injury
- Creatinine Detection Kit
- NGAL ELISA Kits

Hepatotoxicity
- M30-Apoptosense® ELISA Kit
- M65-EpiDeath® ELISA Kit

Infectious & Autoimmune Disease
- Eicosanoid & Cytokine ELISA Kits
- MBL Oligomer Assay
- PathoGene® HPV Probes

Advancements in diagnosis and treatment of disease stem from the early research efforts of scientists working towards a common goal — find the cause of a disease at the gene, protein, or cellular level.
Development of a single drug, whether it is a new chemical entity or a biological therapeutic, requires significant investment of resources. Each step of the process from early discovery through production and delivery must be fully explored, characterized, and understood.

Enzo Life Sciences continues to expand its offering of products for all drug development initiatives with an emphasis on secondary screening, in vitro toxicology assays, and bioprocess optimization. The unique needs of each are considered during the development and characterization of every Enzo product. Our aim is to deliver tools that make drug development more efficient, more cost-effective, and more successful.

Every blockbuster drug or diagnostic test was born through solid science as well as diligence in safety testing, scale-up optimization and robust manufacturing.
Enzo Life Sciences has more than 30 years of experience in the development of enabling platform technologies, many of which provide the foundation for widely used clinical research assays. Furthermore, we have assembled considerable expertise in life science reagent development, including molecular biology reagents, immunoassays, activity assays, and small molecules, all of which serve the drug development and clinical research areas, including biomarker research.

The unique integrated structure of Enzo Life Sciences, Enzo Clinical Labs, and Enzo Therapeutics, under the Enzo Biochem umbrella, allows for a multiplicity of approaches to capitalize on the clinical research space. Our connection with Enzo Clinical Labs, a CAP-certified and New York State permitted clinical reference laboratory, provides invaluable insight into clinical research.

Clinical research is reliant on real-world testing and validated tools to assure consistent, repeatable results.
Searching for answers to focused questions often draws on a variety of research disciplines to look at the question from multiple angles. Using our broad technology acumen, we offer comprehensive solutions within important niche areas to enable this process.

Our core areas of scientific expertise lie within genomics, cellular analysis, small molecule chemistry, proteostasis, epigenetics, immunoassays, and assay development. Combined, the breadth of our scientific expertise and manufacturing capabilities provide you with the flexibility and continuity needed to accelerate your research. Although all of our research tools are built to stand on their own, they are not conceived this way, but rather as part of a greater collection that can be used toward a specific area of discovery.
Enzo Life Sciences has long been recognized as a leading innovator of tools for genomics research and development. The pillar of our molecular biology portfolio is our DNA/RNA labeling chemistries that are applied to array comparative genomic hybridization (aCGH) analysis. A powerful tool for detecting DNA copy number gains and losses associated with chromosome abnormalities, aCGH provides a greater understanding and characterization of genetic disorders, cancers, and other genomic aberrations. The proprietary labeling technology and high-performance dyes incorporated into our aCGH kits deliver superior performance on commonly utilized platforms such as Agilent® arrays.

Supporting our aCGH kits are a variety of everyday-use molecular biology products designed to maximize the quantity and quality of data generated from your valuable samples. These include RNA and DNA amplification kits, as well as labeling systems and modified nucleotides designed for creating biotin- or fluorophore-labeled nucleic acid probes for a variety of applications and detection platforms. The products have been specifically designed to give optimal performance with, for example, nick translation or Agilent® arrays.

Our panel of PathoGene® kits provides high-specificity probes used to classify human papillomavirus (HPV) genotypes in tissue sections by in situ hybridization. Flexible SimplySensitive® and UltraSensitive® detection systems are optimized for use with biotin-labeled probes for in situ detection of specific endogenous or pathogen-expressed genes.
Our CELLestial® portfolio of fluorescent probes and assay kits for cellular analysis provides a complete set of tools for monitoring cell viability, proliferation, death, oxidative stress, and ADME/Tox by flow cytometry, microscopy, and microplate platforms.

Our photostable fluorescent probes are developed to maximize compatibility with common counterstains and fluorescent marker-expressing cell lines. CELLestial® dyes allow pharmaceutical and biotech researchers to accelerate their pre-clinical and clinical drug development programs through early lead compound identification, lead candidate selection, predictive toxicology, and compound characterization.

More than 300 assay kits and over 3,000 highly characterized antibodies support further dissection of these responses. Custom formulation and bulk production of antibodies are also available to fit your specific needs.
Enzo Life Sciences has a long and successful track record in identifying, synthesizing, and commercializing valuable known bioactives for use as research tools.

Our long-standing, flagship Screen-Well® Compound Library product family offers an easy, ready-to-use method for compound screening. We have a unique offering of focused compound libraries including FDA-approved drugs, natural products, receptor de-orphaning, chemical genomics, and pathway targeting.

Our chemistry and compound range includes over 3,000 stand-alone small molecules with known activity including natural products, enzyme inhibitors, receptor ligands, drugs, lipids, and fatty acids.

Our staff of organic chemists are experienced in diverse synthetic methods and techniques. We welcome requests for custom services including development of new synthetic routes for novel molecules and rapid sourcing of compounds.

Through our supplier network, built over a 25 year history, we have the ability to rapidly and inexpensively source traditional, custom, and bulk compounds in the gram to kilogram scale. We complete our sourcing using stringent quality control standards with state-of-the-art methods.

Small Molecule Chemistry

Choose from Over 3,000 Compounds

<table>
<thead>
<tr>
<th>Natural Products</th>
<th>Enzyme inhibitors</th>
<th>Receptor Ligands</th>
<th>Drugs</th>
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</thead>
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| Lipids | Fatty Acids | Antagonists | ... and much more |

Bulk/Custom Sourcing of Compounds

Infinite Possibilities for Customization
Protein homeostasis or ‘proteostasis’ is the process that regulates proteins within the cell in order to maintain the health of both the cellular proteome and the organism itself.

Proteostasis involves a highly complex interconnection of pathways that influence the fate of a protein from synthesis to degradation. As individual components are affected, the others adjust accordingly to maintain normal function. Disruption of one or more of these proteostasis influencers can manifest in pathologies such as Alzheimer’s disease, cancer, and diabetes.

To fuel your proteostasis research, Enzo Life Sciences has an unrivaled portfolio of ubiquitin/proteasome and heat shock protein research reagents through our acquisition of Biomol International and Stressgen® Bioreagents. Our development efforts within the areas of protein synthesis, modification, and degradation continue to produce cutting-edge tools for dissecting key biological processes at the forefront of academic discourse in the proteostasis field. This commitment is evidenced most recently by first-to-market immunoassays, cell based assays, and compound libraries for autophagy, an emerging pathway of interest in cellular regulation of protein turnover and its relation to disease.

Figure adapted from: Kraft, et al.; Nat Cell Biol. 12, 836 (2010).
Epigenetic modulation of gene expression is one component of the proteostasis network, and is a focus of Enzo’s development efforts supported by our expertise in post-translational modification biology and high-quality manufacturing of enzyme activity assays, biochemicals, antibodies, proteins, and peptide synthesis. Our epigenetics portfolio is focused on the enzymology of epigenetic regulation including HDACs, sirtuins, HATs, methyltransferases, and demethylases.

Our revolutionary Fluor de Lys® HDAC and Sirtuin assays allow simple, nonradioactive measurement of deacetylase activity amenable to automated platforms. These assays are founded upon an industry-leading portfolio of active enzymes and high-purity peptide substrates to deliver the sensitivity needed when dissecting epigenetic pathways. In support of screening efforts, our chemists have curated an Epigenetics compound library, a collection of 43 biochemicals with defined activity against epigenetic regulating enzymes, each of which can be supplied individually upon request. Our portfolio of reagents also includes antibodies for the detection of key epigenetic-regulating enzymes and substrates, including modification-specific antibodies for methylated, phosphorylated, or acetylated epitopes.
FLEXIBLE FORMATS FOR BIOMARKER DETECTION

Enzo Life Sciences offers hundreds of immunoassay and enzyme activity assay kits in a variety of formats to service the biomarker and drug discovery assay markets. Our assay offering includes both competitive immunoassays for peptides and small molecules such as cyclic nucleotides and eicosanoids, and immunometric “sandwich” ELISA format assays for large protein analytes including cytokines, cell stress proteins, and signaling pathway regulators. As scientists and manufacturers of kits, we understand the critical nature of your research. Each of our assay kits undergoes rigorous testing to ensure high precision and accuracy while delivering the sensitivity and specificity to detect biologically relevant levels of analyte. Our industry-proven manufacturing capabilities guarantee you will obtain reproducible results, day-after-day and lot-after-lot.

Our decades of experience in the design and manufacture of active enzymes and their substrates supports development of an ever-expanding portfolio of biochemical assays. Our menu of scalable enzyme activity assays includes kits for epigenetic modulation (HDAC, HAT, Sirtuin), matrix metalloproteinases (MMPs) and caspase activity, as well as phospho-specific antibody-based kinase assays. These assays exemplify the synergy in our capabilities, assembling small peptide, active recombinant protein synthesis, fluorescent labeling and detection technologies, and antibody development into robust, reproducible assay kits.
CUSTOMIZED SOLUTIONS FOR YOUR WORKFLOW

A single, static catalog cannot hold all the necessary tools to meet the needs of an ever-changing industry. Our flexibility and access to our internal research and development resources enable our customers access to a wider, more useful, and ever-expanding toolbox.

Choose what you need when you need it.
Whether you require complex assay development or synthesis of novel reagents, our innovative and experienced team of scientists brings professional project management skills and scientific understanding to fulfill your needs on time and to your specifications. Our state-of-the-art laboratories guarantee production and validation of your custom product at the highest level.

The reagent manufacturing capabilities that bring strength to our assay development services are also available on a contract basis. We do not serve the masses with high-throughput assembly-line reagents manufacturing. We do offer high quality, high purity reagents to customers who care that the reagents they contract us to produce are designed, validated, and manufactured with the scientific know-how inherent in our decades of experience in the life sciences reagents business.

CUSTOM SERVICES

FORMAT CHOICES
Our broad expertise gives you the flexibility to choose the platform that meets the needs of your assay
Formats
• Small & large molecule non-radioactive detection
• Plate-based single analyte ELISA/EIA
• Bead-based multiplex platform for flow cytometry
• Heterogeneous & homogeneous formats
• Biomarker assay development
• Enzyme activity assays
• Complex-specific antibody pairs

PROJECT DESIGN
Consultation from a dedicated project manager to create a comprehensive proposal
Consultation and Proposal
• Feasibility
• Assay format
• Detection method
• Reagent availability
• Assay specifications
• Suitable matrices
• Scale-up needs
• Staged project schedule & timeline

REAGENT DEVELOPMENT
If a reagent exists, our global sourcing team can find the best one. If not, our expertise is there to develop one for you
Reagent Capabilities
• Recombinant protein expression & purification
• Small molecule synthesis
• Peptide synthesis
• Custom antibody development
• Conjugation

ASSAY FEASIBILITY
Critical reagents are first tested to determine feasibility. Qualified reagents are then validated to develop a final assay protocol and SOP
Validation Parameters
• Analyte & reagent stability
• Range of quantification
• Limit of quantification
• Limit of detection
• Recovery matrix effects
• Sensitivity
• Specificity
• Dilution linearity
• Parallelism
• Intra-assay & inter-assay reproducibility

SCALABLE MANUFACTURING
Our industry-proven assay manufacturing capabilities guarantee your assay is both robust and reproducible
Manufacturing Capabilities
• State-of-the-art manufacturing facility
• Automated high precision plate coating
• Solid/strip plates in 96 or 384 well format
• Automated packaging & filling equipment
• Custom packaging & bulk fills available
The SMN ELISA kit addresses a critical gap in SMA research and is expected to significantly accelerate SMA therapeutics development. Development and distribution of this system could not have happened without the successful collaboration with Enzo and contributions from the SMA research community.

Karen S. Chen, Ph.D., Chief Scientific Officer, SMA Foundation

SMN ELISA from concept to market

CLIENT: Spinal Muscular Atrophy (SMA) Foundation

NEED: Develop a quantitative ELISA for Survival Motor Neuron (SMN) protein in human and mouse PBMC lysates, to serve as an alternative to more time-consuming, semi-quantitative Western blotting.

COLLABORATION: Following screening of commercially available, privately licensed, and internally developed recombinant protein standards and detection antibodies, a workable assay was deemed to meet feasibility requirements for sensitivity and specificity. Pilot lot kits were manufactured and distributed to researchers within the SMA Foundation network of academic and industry-based SMN-focused research groups. Sample preparation protocols and sample type validation efforts were expanded as additional needs were determined through end-user feedback.

RESULT: A fully validated ELISA (ADI-900-209) and related SMN reagents are now commercially available to the SMA research community. The ELISA sensitivity is 50pg/mL of SMN, and the human SMN standard (developed in-house) displays parallelism with native human and mouse SMN protein in cell lysate samples.

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Karen S. Chen, Ph.D., Chief Scientific Officer, SMA Foundation

The Synergy of Our Combined Expertise: HDAC Profiling

Histone deacetylases (HDACs) are implicated in many human diseases, and are a frequent target for the cancer drug discovery market. Our expertise in organic chemistry and production of high-purity enzymes and unique fluorescent substrates combine to make possible HDAC inhibitor profiling in a high throughput screening format. This synergy is demonstrated by identification of the proprietary Enzo compound BML-281 as a potent and selective inhibitor of the HDAC6 enzyme. Screening was performed using Fluorescein isothiocyanate (FITC) Green substrate and developer along with active recombinant human HDAC enzymes. This flexible fluorescent assay technology is suitable for use with automated plate readers such as the Biotek Synergy™ H4 Multi-Mode Microplate Reader for high throughput assessment of enzyme kinetics and inhibition.

BRINGING IT ALL TOGETHER

MARKET STORIES

SMN ELISA from concept to market

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ANIMAL HEALTH

The Science of Conservation

With thousands of species each year listed as endangered or threatened, the work done by biologists around the world to understand and preserve animal health is never ending. Reproduction studies and stress are two of the most common concerns today, as each species has its unique set of challenges that affect the biology and stresses related to rescue efforts, rehabilitation, and mating.

The challenges of collecting biological samples from a 2-ton Walrus or Polar Bear are obvious. Biologists responsible for their care spend great time and effort collecting and processing urine, feces, blood, saliva, feathers, and fur. For nearly twenty years scientists have trusted Enzo’s steroid hormone ELISA kits to deliver sensitivity and reproducibility for the analysis of their samples, and have accessed our comprehensive support team to optimize input sample types and share feedback.

Our most popular ELISAs for the quantification of \(17\beta\)-estradiol, progesterone, testosterone, cortisol, and corticosterone have been cited in numerous publications and protocols shared by zoos, aquariums, and conservation scientists worldwide, allowing us to create and share an extensive database of knowledge for methods that benefit creatures both large and small.