



Biomarkers
in Clinical Trials

Integrated Lab Performance and BioPharma Solutions From the Organization You Trust

From compound discovery and clinical research through manufacture and release of commercial product and post approval/marketing, Eurofins BioPharma Services provides seamless, end-to-end solutions to help clients progress through the drug development cycle through a single, experienced provider. Our integrated solutions deliver the most comprehensive range of state-of-the-art analytical technologies with an expansive geographic reach in order to support our clients' specialized testing needs and stringent quality and safety requirements around the world.

BIOMARKERS IN CLINICAL TRIALS

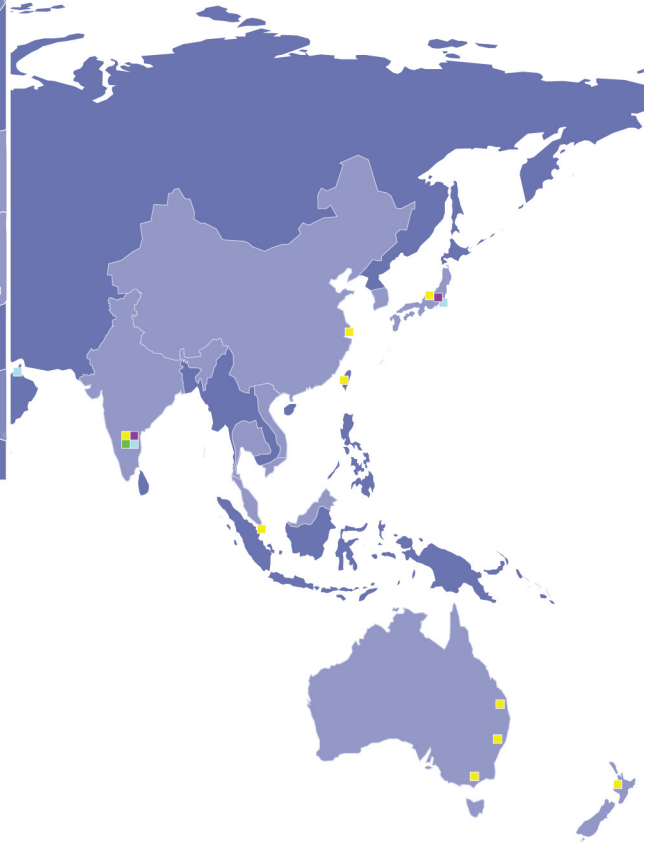
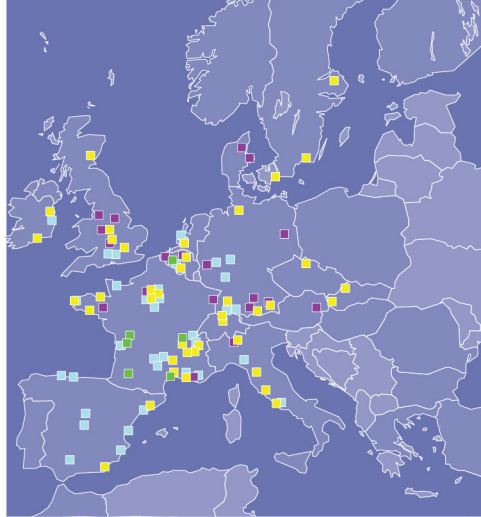
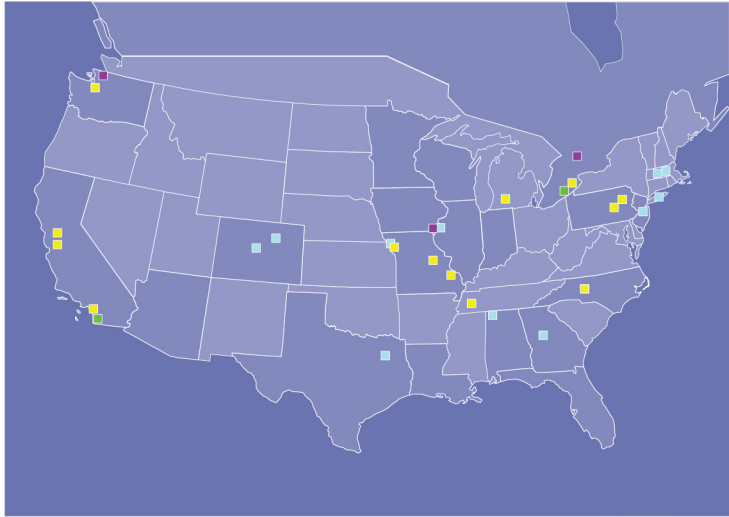
Eurofins Central Laboratory offers exploratory and confirmatory biomarker analysis globally in our 4 CAP-accredited Central Laboratory locations: US, EU, Singapore and China. For modern global clinical trials, utilizing disease-related biomarkers as surrogate endpoints is standard practice. Harmonization and standardization across all laboratory locations is critical for the validity of biomarker utilization. Commercial clinical analyzers and their associated testing kits find great utility in conducting such analyses, and verification of manufacturer specifications is often sufficient for the use in clinical [CAP/CLIA] laboratories. Biomarker data that is used for decision making and for regulatory purposes, requires advanced method validation beyond CAP/CLIA verification. Eurofins Central Laboratory is uniquely positioned with a Biomarker Center of Excellence integrated into the Central Laboratory in a synergetic approach. We are one-of-a-kind in offering advanced validation for biomarker assays on clinical analyzers. Our hybrid system allows us to combine best of both worlds when utilizing Laboratory biomarkers to prove safety and efficacy, support go/no-go decisions, stratify patients, develop companion diagnostics and to support the submission of data sets to regulatory agencies worldwide.





Supported by an industry leading Scientific Team, biomarker assays [for both LBA- and LC/MS/MS-based technologies] are developed and validated fit-for-purpose to meet the specific requirements of your Clinical Trial Program. As our Biomarker Services are fully integrated in our Central Laboratory, we offer a seamless transition to a high volume production testing environment under one roof.

ACHIEVE THE BEST POSSIBLE OUTCOME OF SCIENTIFIC EXCELLENCE

With Eurofins Central Laboratory acting as the hub, in a hub-and-spokes-model, we provide our clients access to over 125 specialized laboratories in the Eurofins BioPharma Solutions network. This model offers an exhaustive range of state-of-the-art technology platforms to support all laboratory biomarker testing requirements spanning protein, genomic and histology biomarker analysis in the support of Clinical Trials.

The network provides you with access to scientists of all laboratory specializations within our organization and allows us to provide highly consultative services. Eurofins is unparalleled in its portfolio of testing, its innovative technology and its history of having a global presence.



-  Pharma Labs
-  Genomics
-  Clinical Diagnostics
-  CDMO

VALIDATE VERSUS VERIFY

To identify biomarkers as surrogate – primary or secondary- endpoints in clinical trials, the relevance and validity of biomarkers need to be determined. Relevance means that a biomarker will actually provide clinically relevant information. Validity refers to the need to characterize a biomarker's effectiveness or utility as a surrogate endpoint. Different purposes for the use of the data require different approaches: validate vs. verify.

Verification and validation procedures go hand-in-hand to prove that a laboratory biomarker assay meets its requirements, specifications and that it fulfills its intended purpose. These procedures are critical components of the quality management system used at Eurofins Central Laboratory.

At Eurofins Central Laboratory, our biomarker method development and method validation processes are in compliance with CLIA, FDA and EMA guidelines and published recommendations on biomarker assay validation.

Validate vs Verify

Verification can be expressed as “Are you testing it right?” whereas Validation can be expressed as “Are you testing the right thing? Deploying pivotal biomarker data as surrogate endpoints in clinical studies require advanced method validation going beyond CAP/CLIA verification. Meeting the needs of our Clients and Regulatory Bodies, the most tested attributes in advanced validation may include, but are not limited to:

- Selectivity
- Precision
- Limit of Quantification
- Specificity
- Reproducibility
- Calibration Curve
- Accuracy
- Limit of Detection
- System Suitability

The applied rigor of data documentation, record keeping and reporting, need to be similar to that of methods for pharmacokinetic support and require GCLP Method Development, Method Validation and Bioanalytical Study oversight by a Study Director.

Eurofins Central Laboratory is uniquely positioned to validate clinical biomarker assay kits with its Biomarker Services by uniting GCLP and CLIA in one synergetic approach. Our hybrid system allows us to combine best of two worlds when utilizing laboratory biomarkers to prove safety and efficacy, support go/no-go decisions, stratify patients and to support the submission of data sets to regulatory agencies worldwide.



SCIENTIFIC CONSULTING

- Assay Feasibility
- Assay Suitability
- Validation Requirements
- Regulatory Compliance
 - Multiplexing



ASSAY DEVELOPMENT AND VALIDATION

- GCLP Method Development & Validation
 - Commercial Kits
- Fit for Purpose Validation from CLIA to Advanced Validation



HIGH THROUGHPUT BIOMARKER TESTING

- Global Kit Production
- Global Sample Management
- Central Laboratory Analysis
- Central Laboratory Reporting

PROTEIN BIOMARKER ANALYSIS

CAPABILITY	TECHNICAL PRINCIPLE	INSTRUMENT PLATFORM
High Throughput Modular Analysis	Colorimetry, Enzymology, Turbidimetry, ISE, Electro Chemiluminescence Immunoassay	Cobas 6000, Cobas 8000
Nephelometry	Immunonephelometry	BN ProSpec
Spectrophotometric	UV, visible light, IR Plate Readers	Spectramax, Specord PC210, Infinite M200
Binding Assays	EIA, ELISA	DSX Best2000, Behring ELISA processor, Evolis, Freedom Evolyzer, Biotek Epoch Universal Plate Reader, Biotek Synergy 2, Perkin Elmer 2104 Envision Reader, Hamilton Microlabstar, MolDev Versamax, MolDev Spectramax M5, Fluostar Omega
Binding Assays	ImmunoCAP, ELiA, Fluoroenzymeimmunoassay	Phadia 100, Phadia 250
Binding Assays	RIA	Perkin Elmer Gamma Counter, Perkin Elmer Wizard 1470-020
Immunoassays	MSD	MSD 600, MSD 2400, MSD SQ120
Immunoassays	Singulex Digital ELISA	Erenna Ultrasensitive Immunoassay Platform
Immunoassays	Luminometry, Bead-based multiplexing	Luminex 100, Luminex 200, Luminex MAGPIX
Immunoassays	Gyros Microfluidics	Gyrolab xP
Coagulation		BCS XP, CS5100, BSC, CA 560
Immunochemistry		Advia Centaur XP, Liaison, Kryptor
Flow Cytometry	Cell Based Assays	FACS Canto II, Beckman Coulter FC500
Binding Assays	Electro Chemiluminescence Immunoassay	Simoa Quanterix
Binding Assays	ImmunoSpot	EliSpot

GENOMIC BIOMARKER ANALYSIS

CAPABILITY	TECHNICAL PRINCIPLE	INSTRUMENT PLATFORM
Genotyping	qPCR, Sanger Sequencing based genotyping, PCR SSO, Multiplex PCR, RFLP PCR, Bisulfite methyl PCR	ThermoFisher 3130 XL DNA Analyzer, ThermoFisher 3730XL DNA Analyzer, Roche Lightcycler LC 480 and 480 II, ThermoFisher ABI7500, MR.SPOT (Bag Health Care), Biocartis Idylla, PCR analyzers
HT Genotyping	Microfluidics	Fluidigm Biomark
HT Genotyping	SNP Array Technology	Affymetrix 3000 G7, GeneTitan, Illumina iScan
Gene Expression	qRT-PCR, Nanostring	Roche Lightcycler LC 480 II, Nanostring nCounter
HT Gene Expression	Microfluidics	Fluidigm Biomark
HT Gene Expression	Micro Array Technology	Affymetrix 3000 G7, GeneTitan, Illumina iScan
Sequencing Analysis	Pyrosequencing	Qiagen Pyromark Q24
Next Generation Sequencing [NGS]	Exome Sequencing including FFPE and deep sequencing, Methylation Sequencing, Targeted panels - Cancer MiSeq, RNA Sequencing, Single Cell Sequencing	Illumina MiSeq, Illumina HiSeq 2500, Illumina HiSeq 4000, Illumina NextSeq 500, ABI 3730 XL96/ABI3100/ABI3130

HISTOLOGY BIOMARKER ANALYSIS

CAPABILITY	TECHNICAL PRINCIPLE	INSTRUMENT PLATFORM
Cytology	Automated slide preparation system	CYTYC THIN PREP 2000, Hologic TP 2000, Hologic TP 5000
Histology	Tissue processors, Multiple Slide Stainer	Sakura VIP 200, Sakura VIP E300V, Sakura DRS 2000
IHC	Automated horizontal slide-processing system for immunostaining, Automated IHC/ISH slide staining system	Dako Autostainer Plus S3800-7635, Ventana BenchMark ULTRA
Imaging	Imaging system	Hologic IMAGING STATION



BioPharma Services

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