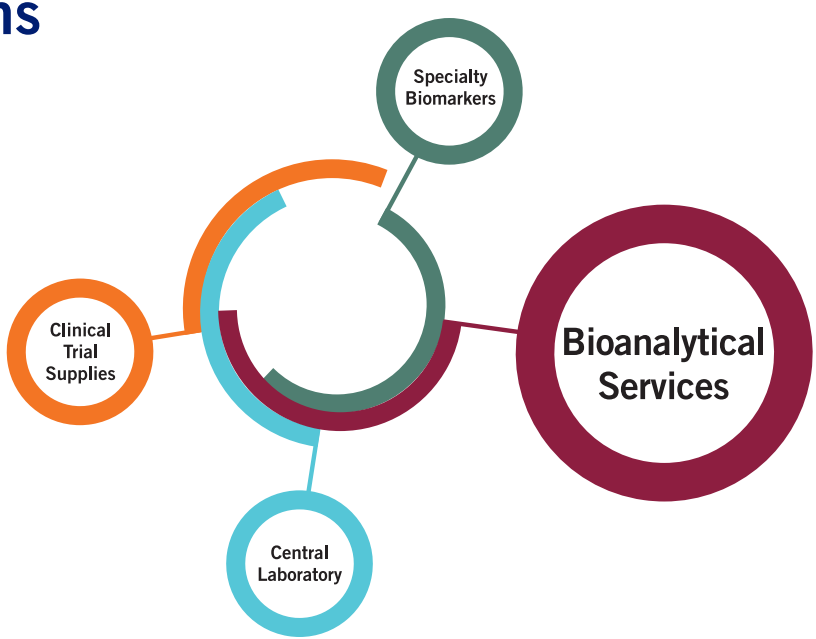
eurofins | Clinical Trial Solutions

Global Leader in Biologics-focused Bioanalytical Solutions



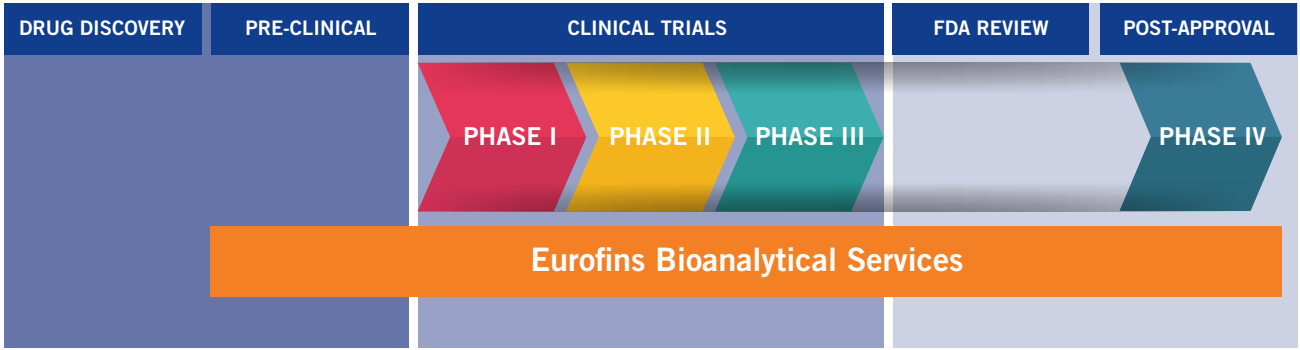
Biosimilars

Pharmacokinetics

Immunogenicity

Biomarkers

Biopharmaceutical Research and Development Process



Eurofins Bioanalytical Services is a biologics-focused, global leader in bioanalytical solutions providing over 20 years of industry-leading scientific expertise. We specialize in comprehensive PK/TK, ADA, NAb, Biomarker assays and sample analysis for the world's largest pharmaceutical and biopharmaceutical companies.

Our mission is to extend our client's capabilities of improving global health by combining scientific knowledge, capacity, regulatory expertise and flexibility to provide the trusted, relevant information required for the drug approval process.

We've proven to be a long term reliable partner for sponsors by having the scientific expertise to solve the most challenging assay issues by combining capacity, efficient laboratory & data review processes with laboratory automation to analyze large numbers of samples in reduced time-frames.

From early stage non-GLP studies to large Phase 3 clinical studies, we adapt to meet your needs.


All testing is conducted in
our Center of Excellence
eurofins
St. Charles, MO USA
• 52,000 sq. ft. total
• 17,000 sq. ft. dedicated
laboratory space

The Importance of Toxicokinetic (TK) and Pharmacokinetic (PK) Services

PK/TK analysis of biologics can be challenging and requires unique solutions from those traditionally employed in the analysis of small molecules. PK/TK data is at the center of any safety/toxicity, efficacy and pharmacodynamic decisions being made on your therapeutic drug. We have worked with most classes of biologics in development and will apply this expertise to solve your molecule's unique challenges.

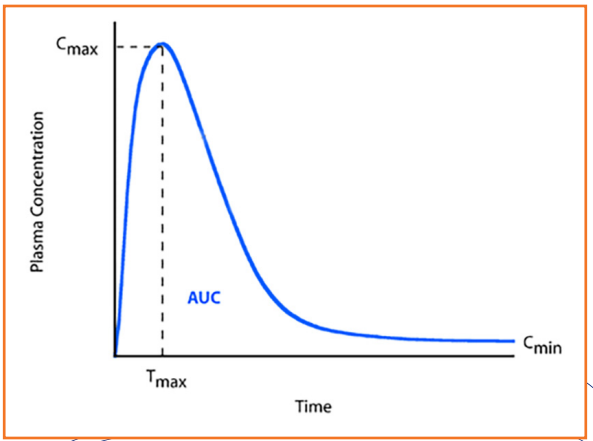
The expertise of Eurofins Bioanalytical Services for biologics and peptides includes method development, method validation and sample analysis.

With Eurofins Bioanalytical Services' PK/TK service offering, you get more than just a service organization, you get access to the top minds in science, years of experience, deep resources, and flexible service.

- Develop or transfer and validate assays that are specific, sensitive, and customized for your study samples
- Provide support for critical reagent generation including antibodies for capture or detection
- Assess method feasibility on multiple platforms to meet the needs of the assay while factoring in cost and timelines

TK and PK Services provided on platforms such as MSD® and Gyrolab®

Pharmacokinetic Curve



Immunogenicity: Expertise you can count on

A key aspect of developing your biologic is accurately assessing whether or not it is immunogenic or can cause an immune response. Biologics, such as antibodies, peptides and recombinant proteins, have the potential to induce an anti-drug antibody (ADA) response, which can cause allergic or anaphylactic reactions, reduction in efficacy, or induction of autoimmunity.

The FDA/EMA has continued to refine its expectations around Immunogenicity assays, but clients are often left questioning:

When do I need to conduct Immunogenicity testing?
Do I need to include Nab analysis?
Where do I find a Positive Control?
Do I need to include disease matrix in my cut point assessment?
and many others…

We support on average 70 Immunogenicity studies per year covering most types of biologic therapeutics.

From non-GLP screening assays to fully regulatory compliant Ligand Binding or Cell Based assays to support late stage clinical studies & biosimilars, Eurofins Bioanalytical Services has the expertise to provide robust regulatory compliant assays and the ability to analyze large sample counts in reduced time frames.

As the program advances toward late stage clinical development, Neutralizing Antibody Assays (NAb) may be required. Our dedicated team of cell based assay experts supports approximately 20 assays per year. With access to hundreds of cell lines through our partners at Eurofins Discovery Services, we can assist in reducing the risk with upfront assay development, thus reducing the time and money for your NAb assay.

Immunogenicity Services provided on platforms such as MSD® 2400, 600 and SQ120

Biomarker Assay Services

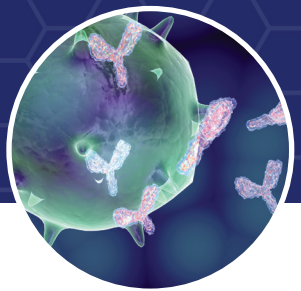
Offering a range of protein biomarker services for all stages of research, from ready-to-run assays through to assay development and validation. No matter which therapeutic area you are working in, Eurofins Bioanalytical Services offers reliable biomarker testing services and an extensive menu of biomarkers, which covers a broad range of instrumentation platforms, species, and matrices.

We provide additional expertise outside of this menu and leverage our bioanalytical expertise to develop and validate genomic, protein, and flow cytometry biomarkers.

- **Flexibility and Expertise**
  What decisions are being made from your biomarker data? We can help you customize and design your assay from a single analyte to a multi-plex assay
- **Wide Variety of assay platforms**
  Our commitment to you is to stay at the forefront of technology by helping you make the optimal choice in a fit-for-purpose approach
- **Scientific Consultation**
  Explore the benefits of working with leading experts in the areas of compliance, regulation and assay design

Find your Analyte by searching our online Biomarker Menu
bit.ly/biomarker-menu

Biomarker Services provided on platforms such as Singulex® Erenna® and Gyros™ Gyrolab®



Biomarker Assay Services

Flow Cytometry

Eurofins Bioanalytical Services has a wide range of experience in applying flow cytometry to exploratory studies through to GLP-compliant sample analysis for clinical trials.

Capabilities include:

- Immunophenotyping
- Cellular activation assessment
- Cell signaling - Phosflow
- Quantification of cell bound drug
- Receptor saturation/modulation
- Functional endpoints
- ADCC, Autophagy, Apoptosis, Phagocytosis
- Rare event analysis (CTL cells)
- Sample kits
- Qualified TBNK and Th Panels

Services include:

- Highly trained and knowledgeable staff to assist with experimental design
- Develop and validate assays to meet specified criteria
- Analyze and interpret data to obtain best insights from complex data outputs

Predictive Cytokine Release Assays

The Cytokine Release Assays provide drug developers rapid access to early drug safety data, and as core assays are pre-qualified, the development costs and time are eliminated. Eurofins has developed pre-qualified Cytokine Release Assays, ex vivo assays that test the risk of a therapeutic inducing cytokine release.

Cytokine release syndrome (CRS) is an adverse event on administration of biotherapeutics, typified by the production of pro-inflammatory cytokines, including TNFα, IFNγ, IL-6 etc. It causes “flu-like” symptoms, including pyrexia, nausea, rigors, but can be more severe with capillary leak syndrome resulting in hypotension and organ damage. The most severe example in recent years was with the CD8 super-agonist TGN1412.

Drug companies should evaluate cytokine release if:

- The drug is a biotherapeutic
- The drug is monoclonal antibody based (e.g., ADC or Bispecific)
- The drug is immunomodulatory / interacts with the immune system

Biomarker Services provided on platforms such as FACSCanto II™ and Beckman Coulter®FC500

Product Characterization

Eurofins Bioanalytical Services is the leader in applying specialized testing methodologies for the biotherapeutic characterization.

Our extensive experience with a variety of techniques and sample types lends the ability to tailor the testing to meet specific client requirements at one testing location. We can transfer client provided methods as well as conduct de novo assay development. We have extensive experience with a variety of product types including:

- Therapeutic Proteins
- Monoclonal Antibodies
- Biosimilars
- Conjugates
- Antibody-Drug Conjugates (ADCs)

Our ligand binding and cell-based assays for target antigens include:

- Receptor-binding assays
- Proliferation assays

Flow cytometry assays to characterize Fc receptor binding:

- FcγRI (CD64)
- FcγRII (CD32a)
- FcγRIII (CD16a)
- FcRn binding by SPR assay
- C1q by ELISA assays
- ADCC and CDC
- Peptides

One Partner

A depth of knowledge

Our People

Knowledgeable Subject Matter Experts

Strong Project Management

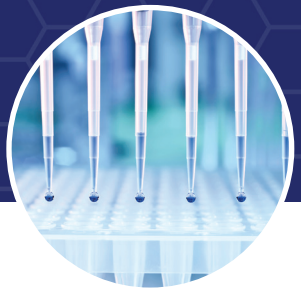
Consulting Services

Our Solutions

Broad Platform Capabilities

Broad Client Base. Biotechs to Large Pharma

Outstanding Quality Systems and Record



The Importance of Biosimilar Testing

Eurofins Bioanalytical Services has years of experience supporting innovator and biosimilar programs, making us the ideal development partner. Following the latest regulations and guidance, we tailor bioanalytical and characterization packages to meet the distinct needs of our biosimilars clients. We use the latest technologies and procedures to ensure accuracy, adherence to standards and on-time delivery of critical data, no matter the size of project.

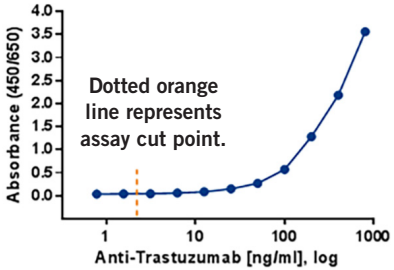
Prequalified assays for:

- Trastuzumab
- Bevacizumab
- Adalimumab
- Cetuximab

Non-clinical / Clinical Services

- Tiered Immunogenicity/ADA
- PK
- Biomarker analysis

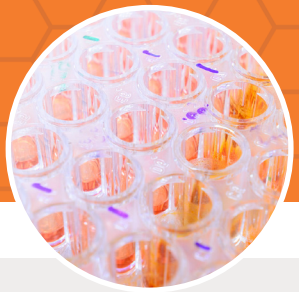
Representative curve for sensitivity of trastuzumab ADA in human serum.



Biological Characterization Services

- Ligand-binding and cell-based assays for target proteins
- CD64, CD32, CD16 binding by surface plasmon resonance and flow cytometry
- C1q binding by ELISA
- Proliferation, neutralization and receptor binding assays
- ADCC and CDC assays

Critical Reagent Development and Qualification Services



The structural integrity and functional quality of critical reagants is often linked to assay performance and can enable the highest degree of quality results.

With a dedicated critical reagent team, Eurofins Bioanalytical Services assists in the production and qualification of critical assay reagents for our clients including:

- Preparation and qualification of critical reagents
- Overseeing issues with troubleshooting and lot-to-lot variability during initial qualification and requalification of reagents throughout the life of the study
- Tracking systems for reagents. We proactively keep track of the stock of critical reagents
- Responsible for securing, dispensing, maintaining and tracking clients proprietary reagents in a secure storage facility

- Biotinylation
- Ruthenylation
- Fluorescent dye conjugation
- Nanoparticle surface modification
- Protein-Protein coupling
- Protein-PEG coupling
- PEGylation of substrates
- Affinity purification of antibodies
- Nucleic acid-protein coupling
- Aptamer-protein coupling
- Radioiodination

Delivering Quality Results

Eurofins Bioanalytical Services offers integrated solutions designed to ensure the highest quality data achievable by providing accountability and traceability while emphasizing a total quality management process.

Eurofins Bioanalytical Services has an independent Quality Assurance team, and the quality systems are based on 21 CFR Parts 11 & 58.

The quality system includes internal audits, an electronic documentation and training system, deviation and CAPA programs, and Standard Operating Procedures.

- Focus on achieving accurate results within clients' timelines to help make informed decisions.
- Ensuring integrity of results and adherence to GxP (GLP and GCP) regulatory standards.

By the Numbers

>20
years experience developing, validating, transferring custom assays

20
successful global client audits each year

>50K
yearly testing output for clinical samples

50
transfer/developed & validated methods per year

Average >250 active studies

standard turn-around business days from receipt of sample to data delivery

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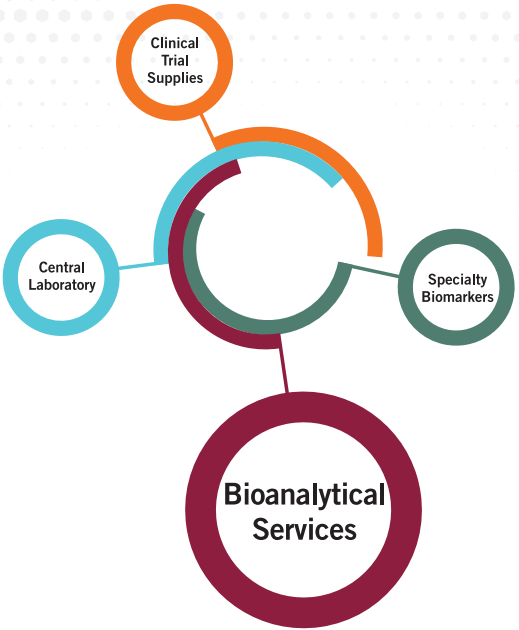
Enhancing lives, one assay at a time



Solutions enabled by World-leading Scientific and Technical Expertise

Over 20 years of industry-leading global **Scientific Expertise** supporting the widest breadth of Biologics' clinical trials with PK/TK, ADA, NAb and Biomarker assays and sample analyses.

Versatile Performance and Project Management Excellence to adapt to a client's specific needs. Clinical or preclinical, regulated or non-regulated, assay development, qualification or validation; we custom design our support to match the client's program.

State-of-the art laboratory facilities in St. Charles, MO, USA providing **Global Reach and Capacity** to address clients' needs while simultaneously offering regionally-based solutions.

For more information about Eurofins Bioanalytical Services team please contact:

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