Triclinic Labs
Solid-State Development and Characterization

Senior Scientist, Large-Molecule Analytics and Materials Characterization

Triclinic Labs | Lafayette, Indiana
Full-time | On-site

About Triclinic Labs

Triclinic Labs is a contract laboratory providing analytical testing, materials characterization, and scientific consulting services to pharmaceutical, biotechnology, and other research-driven organizations. Our scientists develop analytical solutions, investigate complex material and product behavior, and deliver scientifically defensible results that support development, manufacturing, and quality decisions.

Position Summary

Triclinic Labs is seeking a Senior Scientist with expertise in **large-molecule analytics and the biophysical and physicochemical characterization of proteins, monoclonal antibodies, peptides, and other macromolecular therapeutics.**

The successful candidate will independently design and execute studies, develop and troubleshoot analytical methods, interpret complex datasets, and translate findings into clear recommendations for clients. Primary responsibilities include evaluating molecular identity, purity, heterogeneity, aggregation, higher-order structure, conformational stability, particle formation, and formulation behavior.

This is a hands-on laboratory position requiring technical independence, strong experimental judgment, and effective client communication. The Senior Scientist will also lead projects, mentor colleagues, and help establish and expand Triclinic's large-molecule analytical capabilities.

Primary Responsibilities

Large-Molecule Analytical Characterization

Develop and execute analytical strategies for characterizing large-molecule drug substances, drug products, and related materials. Select appropriate methods to evaluate identity, concentration, purity, aggregation, fragmentation, charge heterogeneity, and chemical or physical degradation.

Develop, optimize, and troubleshoot chromatographic methods, including size-exclusion, ion-exchange, and reversed-phase chromatography. Integrate

complementary analytical techniques as appropriate to the molecule, formulation, development stage, and scientific question.

Design and conduct studies supporting formulation development, stability assessment, forced degradation, and analytical comparability. Evaluate the effects of storage, processing, sample preparation, and handling on analytical results and product attributes.

Biophysical and Materials Characterization

Lead studies addressing the structure, stability, interactions, and physical behavior of proteins and other macromolecular systems. Establish complementary testing approaches to evaluate molecular size, self-association, oligomeric state, aggregation, higher-order structure, thermal unfolding, and particle formation.

Investigate the effects of pH, ionic strength, excipients, protein concentration, temperature, agitation, freeze-thaw cycling, and other relevant stresses on molecular and formulation stability.

Characterize the physical properties of biologic formulations, including concentrated protein solutions and lyophilized products, as appropriate to project needs. Investigate unexpected changes in appearance, particle populations, viscosity, structural integrity, or stability.

Interpret results across multiple platforms to distinguish meaningful product changes from analytical artifacts, sample-preparation effects, and method limitations.

Analytical Method Development and Quality

Independently develop, qualify, validate, verify, and transfer methods according to their intended use and applicable project requirements. Establish appropriate sample-preparation procedures, controls, reference materials, system-suitability criteria, and data-analysis practices.

Prepare and review study plans, protocols, analytical methods, standard operating procedures, technical reports, and supporting documentation. Maintain complete, accurate, and traceable laboratory records, with conclusions supported by the underlying data.

Follow applicable quality-system, cGMP, data-integrity, and laboratory safety requirements. Collaborate with Quality Assurance on investigations, deviations, and corrective actions when required.

Troubleshoot instruments and methods, support instrument qualification and maintenance, and improve analytical reliability, reproducibility, and efficiency.

Project Leadership and Client Communication

Serve as the scientific lead and primary technical contact for assigned projects. Work directly with clients to define objectives, recommend analytical approaches, establish appropriate deliverables, and explain results and limitations.

Develop realistic scopes of work, resource estimates, and timelines. Manage multiple projects concurrently while communicating technical risks, scope changes, and scheduling concerns promptly.

Deliver clear technical reports and presentations that connect experimental findings to the client's development, formulation, manufacturing, or quality question.

Capability Development and Scientific Mentoring

Evaluate and recommend new analytical platforms, methods, and workflows that strengthen Triclinic's large-molecule characterization services. Support implementation through method development, documentation, training, and demonstration of fitness for intended use.

Mentor scientists in experimental design, instrument operation, method troubleshooting, data interpretation, and technical writing. Contribute to technical proposals, application notes, presentations, and publications.

Relevant Technical Expertise

Candidates should have substantial hands-on expertise in several of the following areas. **Expertise in every listed technique is not required.** These platforms describe relevant candidate experience.

- **Molecular size, aggregation, and self-association:** Size-exclusion chromatography with multi-angle light scattering (SEC-MALS), dynamic light scattering (DLS), and analytical ultracentrifugation (AUC).
- **Higher-order structure and conformation:** Far- and near-UV circular dichroism (CD), and FTIR or Raman spectroscopy applied to protein structure and conformational changes.
- **Thermal and conformational stability:** High-sensitivity differential scanning calorimetry suitable for biomolecules, differential scanning fluorimetry (DSF), and nanoDSF.
- **Submicron and subvisible particle characterization:** Nanoparticle tracking analysis, light obscuration, flow imaging, and related particle-imaging methods.

- **Formulation flow properties:** Viscometry and rheology, particularly for concentrated protein formulations and studies relevant to processing, fill-finish operations, and injectability.
- **Chromatographic characterization:** Size-exclusion, ion-exchange, and reversed-phase chromatography applied to large-molecule purity, heterogeneity, stability, and degradation.

Required Qualifications

- Ph.D. in analytical chemistry, biochemistry, biophysics, pharmaceutical sciences, materials science, or a closely related discipline. Candidates with an M.S. or B.S. and substantial directly relevant industry experience will also be considered.
- Typically three to five or more years of relevant laboratory experience, with demonstrated ability to independently plan studies, solve analytical problems, and deliver scientifically defensible results. Depth and relevance of experience are more important than years alone.
- Demonstrated hands-on experience in **large-molecule analytical and biophysical characterization**, including method development and troubleshooting. Direct experience with proteins, peptides, or other macromolecular therapeutics is essential.
- Practical expertise in large-molecule chromatography and complementary biophysical techniques, with a strong understanding of sample preparation, experimental controls, quantitative analysis, and method limitations.
- Strong technical writing, client communication, and project-management skills, with the ability to manage competing priorities and work independently while collaborating across scientific disciplines.

Experience limited to conventional small-molecule analysis or solid-state characterization does not satisfy the core technical requirements of this position.

Preferred Qualifications

Additional experience in intact-mass analysis, peptide mapping, capillary electrophoresis, or other complementary approaches to large-molecule characterization is desirable.

Experience with lyophilized biologics, protein–excipient interactions, high-concentration protein formulations, analytical comparability, or investigations of aggregation and particle formation is particularly relevant.

Prior work in a pharmaceutical, biotechnology, or contract laboratory environment is preferred, especially experience with cGMP studies, analytical method validation and transfer, client-facing scientific leadership, and implementation of new laboratory capabilities.

What Success Looks Like

The successful candidate will translate client questions into well-designed studies, generate reliable data, and deliver clear scientific interpretations within agreed timelines and budgets. They will demonstrate independent technical judgment, communicate limitations and risks early, and strengthen Triclinic's ability to solve complex large-molecule analytical and formulation problems.

Application Materials

Submit a résumé or curriculum vitae and a brief summary of relevant experience in large-molecule analytics, biophysical characterization, analytical method development, and scientific project leadership.