Coriolis Pharma
Biopharmaceutical Research and Development Service

GMP compliant analysis of aggregates and subvisible particles

www.coriolis-pharma.com

Meet regulatory requirements

Protein aggregates can be very heterogeneous in their size, ranging from few nanometers up to visible particles of > 100 µm. At Coriolis Pharma we understand that an **orthogonal approach for analyzing aggregates** is crucial to assure the optimum stability of a formulation and, more increasingly, that customers and authorities wish such studies to be conducted in a **quality controlled environment**. This is to ensure a maximum in data integrity, traceability and documentation.

We have successfully established and qualified emerging techniques such as Field Flow Fractionation (AF4/HF5), Micro-Flow Imaging (MFI), nanoparticle tracking analysis (NTA), semi-automated visual inspection, or resonant mass measurement (RMM) and together with light obscuration, turbidity, dynamic light scattering (DLS) and HP-SEC we can offer these methods under GMP to cover the full aggregation size range.

Within this setup we also serve customers requesting performance of **non-GMP studies in a controlled (GMP) environment** using fully qualified equipment but still at the flexibility of an R&D project. We're happy to offer this quality level tailored to your needs.

Coriolis Pharma offers GMP compliant service for analysis of aggregates and subvisible particles

Our capabilities include:

- Validation of transferred customer methods
- Product-specific validation of in-house methods
- Batch release and stability testing
- Support of formulation and process development
- Studies in full GMP compliance or “enhanced R&D” level within a GMP environment

Light Obscuration

- Quantification of particles ≥1 µm
- Pharmacopoeia method for the determination of subvisible particles ≥ 10 µm and ≥ 25 µm (USP, Ph. Eur.)
- Low volume method in accordance with USP <787>

Micro-Flow Imaging (MFI)

- Quantification, characterization and visualization of particles ≥1 µm
- Particle images and shape analysis
- Differentiation between particles of different origin (protein, silicone oil droplets, filter shedding, etc.)
- High sensitivity for translucent (protein) particles
- Referred to by regulatory authorities as orthogonal method to light obscuration

Resonant mass measurement (RMM)

- Quantification of particles in the submicron range
- Differentiation of silicone oil droplets from protein particles

Dynamic light scattering (DLS)

- Qualitative analysis of aggregates in the 1 – 1000 nm range
- High sensitivity to aggregation

Nanoparticle tracking analysis (NTA)

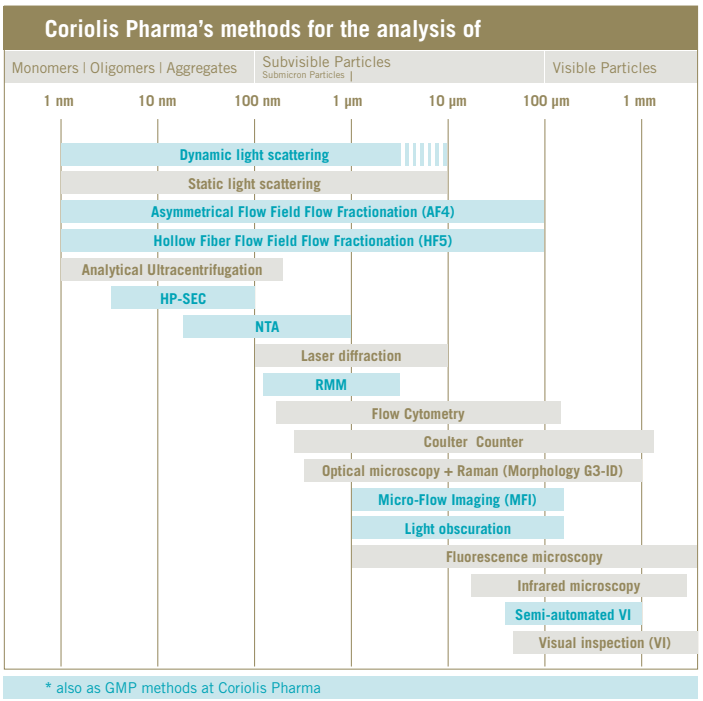
- Qualitative and semi-quantitative analysis of particles in the submicron range
- Analysis of polydisperse samples
- Suitable for characterization of VLPs, liposomes or exosomes

Turbidity Analysis

- Quantification of turbidity according to Ph.Eur.
- Suitable for stability studies

ETAC – Automated Visual Inspection

- Semi-quantification and – qualification of visible particles
- Standardized documentation of visible particles (images and videos)
- Sizing of visible particles within vials and syringes



* also as GMP methods at Coriolis Pharma

Size exclusion chromatography (HP-SEC)

- Industry standard for aggregation analysis
- Quantification of monomer, aggregates and fragments
- Combined with various detection systems (UV, fluorescence, RI, MALLS)

Asymmetric Flow Field Flow Fractionation (AF4) / Hollow Fiber Flow Field Flow Fractionation (HF5)

- Quantification of monomer, aggregates and fragments
- Orthogonal method to HP-SEC
- Higher separation range than HP-SEC
- High flexibility with respect to mobile phase
- Combined with various detection systems (UV, fluorescence, RI, MALLS)

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Every particle counts