

Contract Research Services

Pronexus Analytical AB is a contract research organization offering services in neurochemical *in vivo* monitoring and allied bioanalytical techniques. Our mission is to serve pharmaceutical companies and research organizations aiming to accelerate the process of drug discovery, evaluate mechanisms of drug actions and strengthen functional validation of candidate drugs.

The bioanalytical services provided by Pronexus are focused on applications of techniques and methods for monitoring brain chemistry *in vivo* including microdialysis and biosensors. The bioanalytical laboratory and the animal research facility are GLP-compliant with full regulatory approvals.

Technology benefits

Microdialysis and biosensor techniques allow *in vivo* monitoring of the release, uptake and metabolism of neurotransmitters and other neuroactive molecules diffusing in the extracellular space of the brain.

Studies including PK/PD and targeted bioavailability such as penetration of a drug through the blood-brain barrier could be carried-out in an elegant way by use of multiple microdialysis probes sampling from various body compartments.

Microdialysis offers the closest correlation of neurochemistry *in vivo* to behavior or to electrophysiological measures of brain activity.

Microdialysis strengthens the predictive validity of animal models of psychiatric and neurological/neurodegenerative diseases and serves as a unique tool for investigating the mechanisms of drug actions.

Microdialysis data may play a crucial role in the decision process concerning further development of a new drug.





The services include:

Experimental models

Specialized skills in microsurgery, stereotaxic surgery and *in vivo* handling protocols

- **Microdialysis protocols** on anesthetized or awake rats and mice, proof-of-concept studies, monitoring neurotransmitters and other surrogate markers.
- **Pharmacokinetics** and drug brain delivery, targeted drug delivery through the BBB, triple microdialysis - PK/PD profiles of unbound drug concentrations in blood and brain compartments.
- **Microsurgery**, stereotaxic surgery on small rodents, injection/infusion cannulas including microdialysis probes, syringe minipump-based continuous/discontinuous drug infusions for up to 4 weeks, Alzet osmotic pumps.
- **Lesion models** of neurodegenerative diseases.
- **Simultaneous microdialysis** sampling and behavioral monitoring.

Analytical services

Unsurpassed sensitivity of neurochemical HPLC methods

- **Ultra-sensitive detection of monoamines**
Unique fluorescence derivatization/HPLC methods developed for simultaneous determination of noradrenaline, dopamine and serotonin down to 10^{-11} M (100 attmol/20 μ l) and for histamine (300 attmol/20 μ l).
- **HPLC techniques optimized for determination of neurotransmitters, neuro-modulators and related molecules in the microdialysates**
Serotonin, noradrenaline, dopamine and their metabolites, acetylcholine, GABA, aspartate and glutamate, glycine, physiological amino acids, histamine, adenosine and other purines, cAMP, cGMP, kynurenic acid, radical oxygen species (ROS), $\text{NO}^2^-/\text{NO}_3^-$, Mg^{2+} , Ca^{2+} and other ions.
- **HPLC and LC/MS methods for analysis of biological samples**
Determination of neurotransmitters or specified biomolecules, drug levels in plasma, CSF and tissue extracts.
- **HPLC and enzymatic spectrophotometric assays for clinical microdialysates**
Amino acid analysis, lactate, pyruvate, glycerol, glucose, enzymes and clinical biomarkers.