Interreg North-West Europe
Co-funded by the European Union
STEP4NAMs

APPLY

Challenge-based SME support

#09 Development & qualification of a Liver-on-a-Chip (liver MPS) for quantitative ADME in drug discovery: (1) low clearance (CLint,u) determination and (2) metabolite formation/identification (MetID)

EXPECTED DELIVERABLE

Indicative duration: 6 – 9 months

Develop and validate a liver-on-a-chip workflow to provide reliable quantitative ADME data for two key applications:

- Low clearance (CLint,u) for metabolically stable compounds (multi-day incubation; IVIVE/PBPK-ready outputs)
- Metabolite formation & MetID (primary/secondary/tertiary metabolites; HRMS-based identification; time-course capability)

Platform & Quality Foundation (mandatory):

- Liver chip platform description: device design, flow/perfusion, materials, ECM, sampling strategy.
- Cell system documentation: Cells source/lot, seeding density, culture conditions, traceability.
- Baseline performance & stability: evidence of viable, functional liver phenotype maintained over multi day culture (≥72–96 h).
- SOPs & acceptance criteria: end to end experimental, analytical, and data processing SOPs with predefined run acceptance criteria.

Low Clearance (CLint,u) Qualification:

- Multi day depletion data for a defined benchmark panel including low turnover compounds.
- Robust CLint,u estimation, normalized to effective cell number.
- Evaporation/sampling correction approach (option) (experimental control and/or modelling) with demonstration of its impact on CLint.
- Reproducibility assessment (repeatability and inter run precision).
- IVIVE/PBPK ready output: CLint,u values with assumptions and limitations clearly documented.

Metabolite Formation & Identification (MetID):

- Validated MetID workflow (HRMS based) with reporting standards and confidence levels.
- Metabolite coverage dataset for benchmark compounds, including at least one complex, low turnover compound.
- Time course metabolite profiles, capturing primary and downstream (secondary/tertiary) metabolites where relevant.
- Qualitative reproducibility of major metabolite identification across independent runs.

At the end, the biotech must deliver a reproducible, well-documented liver-on-a-chip workflow that reliably measures low intrinsic clearance and identifies relevant human metabolites, with model-informed correction of system artifacts (optional) and PBPK-ready outputs.

LONG-TERM COLLABORATION POTENTIAL

Subject to scientific and strategic alignment

If the platform meets the defined performance and reproducibility criteria for these overarching contexts of use, there is interest to expand to additional ADME/DMPK applications (e.g., Fraction metabolised (f_m) pathway contributions, broader enzyme/transporter interplay, DDI mechanistic studies), consistent with the broader industry direction for qualified MPS use.

CANDIDATE SELECTION

Initial eligibility check by MPR. Final selection by the challenge provider based on fir, relevance, readiness and innovation potential

Minimum required Technology Readiness Level (TRL)

Biotech must demonstrate (or credibly plan within 9 months) the following:

- Liver MPS experience with multi-day culture stability and quantitative endpoints.
- Bioanalysis capability (LC-MS/MS required; HRMS MetID in-house or via named partner).
- Quality & documentation maturity (SOPs, acceptance criteria, traceability, data integrity).
- Reproducibility mindset (repeatability + intermediate precision plan).

Additional selection criteria

- > 50 employees preferred, must demonstrate sufficient staffing to deliver within 6–9 months typical expectation: dedicated project lead + cell culture + bioanalysis + data analysis)

Completion of EDUCATE	Core Module
Company status	SME under EU criteria
Maximum number of supported companies	1 – 2
Confidentiality: NDA/ CDA required	Likely required
Geographic area	SME from across EU are welcome. SMEs from Interreg NEW are prioritized, particularly partner regions

APPLICATION

Directly via the STEP4NAMs Moodle platform

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