German research institute offers to develop scalable, microfluidic and tailored nanoformulations including lipid/polymer/peptide/magnetic nanoparticles-based platform for nucleic acid delivery: Open for EU consortia (Horizon Europe, EIC Pathfinder, Eureka)

Summary

Profile type	Company's country	POD reference
Research & Development Request	**Germany**	**RDRDE20250822009**
Profile status	**Type of partnership**	**Targeted countries**
PUBLISHED	**Research and development cooperation agreement**	**• World**
Contact Person	**Term of validity**	**Last update**
Enrico FRANZIN	**22 Aug 2025** **22 Aug 2026**	**22 Aug 2025**

General Information

Short summary

A German research institute specialising in nanomedicine and process engineering seeks to join an R&D consortium to develop advanced, customisable mRNA nanoformulations. The institute offers a microfluidic-assisted, scalable platform enabling high-throughput screening and optimisation of lipid/polymer-based delivery systems. Collaboration is targeted within Horizon Europe Cluster 1: Health, EIC Pathfinder, or Eureka funding frameworks.

Full description

Current microfluidic-based mRNA-Lipid or polymeric nanoparticle formulation process face limitations in the linear scaling up of the formulation from small-scale batches to production capacity.
Additionally, GMP compliant process infrastructure for small-scale manufacturing is still challenging and critical for personalized medicine or early clinical trials samples.
Consequently, as the personalized therapies require the rapid and efficient production of small, patient-specific batches the key obstacles include high cost per batch due to low production volumes, critical encapsulation

challenges, and regulatory complexity hinder efficient development. Optimizing LNP formulations at small scale with diverse lipid compositions requires flexible manufacturing processes with extensive experimentation, often hampered by limitations in mixing efficiency and throughput. This creates a technological gap which needs to be addressed.
Proposed Solution:
The institute's existing microengineering platform, featuring a diverse portfolio of micromixer designs addresses this gap. The platform offers precise control over critical process parameters (CPP), including flow rate, residence time, reaction conditions and allows for the controlled self-assembly of various amphiphiles, including phospholipids, cationic lipids, and PEG-lipids along with other novel materials (polymer, peptides)
The institute offers:

- Optimizing Micromixer Design: With over two decades of micromixer expertise, the institute tailors mixing conditions for various lipid formulations, tackling issues like viscosity, solubility, and lipid interactions. In-house capabilities support the fabrication of micromixers in stainless steel or other GMP-suitable materials, enabling cost-effective and scalable manufacturing.
- Formulation Screening: A high-throughput screening platform identifies optimal lipid compositions and process parameters for specific mRNA or any other therapeutic drug payloads rapidly and efficiently.
- Regulatory compliant Process platform: The modular platform integrates a precisely controlled micromixing unit, downstream processing via tangential flow filtration (TFF), and patented online analytics using flow dynamic light scattering (DLS). This platform is designed for automation and regulatory compliance, accelerating the path to GMP-compliant manufacturing.
- Scale-up process approach: Optimized formulations and process parameters identified through screening will be translated into manufacturing processes suitable for clinical trials and commercial production. The collaboration will explicitly address GMP compliance and all relevant regulatory considerations.
- Digital Innovation: Current ongoing projects are based on establishing the Machine Learning (ML) assisted simulation platform for the optimization and predictability of nanoformulation processes for regulatory-compliant formulation and for "first try success" formulation development to achieve significant cost reduction, faster and more efficient production.
- Collaboration Benefits: Consortium and partners can benefit from Institute's cutting-edge microengineering technology, accelerating nanoformulation development to provide a competitive edge in the rapidly evolving mRNA therapeutics market.

Advantages and innovations

- 20+ years of expertise in microengineering and micromixing technology enables efficient developments in nanomedicine.
- In-house, state-of-the-art infrastructure capacity to customize the mixing devices accord-ing to formulation needs.
- Experienced R&D partners in multiple German and EU-based projects focusing on de-veloping therapeutic and theranostic applications in rare disease and cancer indications.
- Scalable mRNA formulation system for screening and process development.
- Process development for continuous manufacturing of micromixer-assisted nanocarriers.
- Versatile nanoparticle systems including lipid nanoparticles (LNP), thermoresponsive polymer/peptide-based nanoparticles, liposomes, extracellular vesicles, and magnetic nanoparticles for therapeutic and diagnostic applications.
- Optimization and implementation of (inline) nano- and bioanalytics.
- Provide services for sample analysis, protocol assistance, and scientific advice on ad-vanced characterization techniques using transmission electron microscopy (cryo-TEM).

Technical specification or expertise sought

Stage of development

Available for demonstration

IPR Status

IPR granted

IPR Notes

Sustainable Development goals

- **Goal 3: Good Health and Well-being**
- **Goal 17: Partnerships to achieve the Goal**

Partner Sought

Expected role of the partner

Potential partner Type:
- Research institutes and universities
- Scientific societies and consortia
- SMEs, mid-sized or large companies

Partner Domain:
- Pharmaceutics and biotechnology
- Food and agriculture applications
- Perfumery and cosmetics industries
- Veterinary medicine

For EU-funded research and innovation projects the institute is particularly interested in partners with expertise in:
- Project Coordination: Experienced coordinators who can lead EU consortia and manage multi-partner projects efficiently.
- Pre-clinical Studies: Partners with facilities and experience in in-vitro cell culture as-says and/or animal testing to validate nanoformulation-based drug delivery systems.
- Raw Material Supply: Providers of formulation-grade raw materials, including lipids, polymers, RNA therapeutic drugs, and biophysical/biochemical testing materials re-quired for pre-clinical studies.
- Application Expertise: Partners who can test or apply developed nanoformulations in therapeutic areas such as oncology, infectious diseases, veterinary applications, or other targeted delivery fields.
- Translation & Commercialization: Industrial partners capable of scaling up validated technologies towards clinical development, manufacturing, and market access.

Type of partnership

Research and development cooperation agreement

Type and size of the partner

- **SME 11-49**
- **Other**
- **SME <=10**
- **Big company**
- **SME 50 - 249**
- **University**
- **R&D Institution**

Call Details

Framework program

Horizon Europe

Call title and identifier

HORIZON-HLTH-2025-01-IND-01: Optimising the manufacturing of ATMPs
HORIZON-HLTH-2025-01-TOOL-03: GenAI4EU
HORIZON-HLTH-2025-01-TOOL-05: Boosting the translation of biotech research into innovative health therapies

Submission and evaluation scheme

Single stage submission: Deadline: 16 Sept 2025, Results: End Jan 2026

Anticipated project budget

Coordinator required

Yes

Deadline for EoI

10 Sep 2025

Deadline of the call

16 Sep 2025

Project duration in weeks

Web link to the call

https://hadea.ec.europa.eu/news/2025-horizon-europe-health-calls-proposals-2025-05-22_en

Project title and acronym

Dissemination

Technology keywords

- **06004 - Micro- and Nanotechnology related to Biological sciences**
- **06001013 - Medical Technology / Biomedical Engineering**
- **06001006 - Human vaccines**
- **05005 - Micro- and Nanotechnology**

Market keywords

- **04017 - Micro- and Nanotechnology related to Biological sciences**
- **05007007 - Other medical/health related (not elsewhere classified)**
- **05001005 - Molecular diagnosis**

Targeted countries

- **World**

Sector groups involved

- **Health**