



NEOLIVER will develop the world's first autologous bioprinted liver, engineered from patient-derived multicellular spheroids using bioprinting technologies. This will involve the development of dense, vascularised liver constructs validated in large animal models. Regenerative alternatives to organ transplantation are essential for addressing organ shortage, improving patient outcomes, and reducing pressure on healthcare systems. Proposed innovative bioprinting technologies promise to engineer functional liver constructs, expand therapeutic options, and improve global health outcomes.



Dr. Bart Spee

Project Coordinator, Utrecht University

1. Describe your project through key words/key phrases that identify it.

- Liver organoids and supporting cells
- Regenerative medicine
- Biofabrication, including bioprinting
- Graft function
- Innovative therapeutic strategies
- End-stage liver disease

2. In terms of impact, what will be the most tangible your project will achieve?

NEOLIVER will deliver new regenerative strategies and evidence that can directly expand therapeutic options for patients with end-stage liver disease:

- New regenerative strategies aimed at improving liver function
- Expanded therapeutic options as an alternative to conventional transplantation
- Clinically relevant approaches to engineer liver constructs from scratch with complete liver function
- Potential to reduce the need for full organ transplantation
- Validated protocols ready to be taken forward into clinical evaluation
- Translational frameworks bridging bioprinting research and clinical application

In short, project aims to move bioprinted liver constructs from research into a clinically viable alternative to organ transplantation.

3. Please describe your project's overall impact, if applicable, at the European level.

At the European level, NEOLIVER addresses a major unmet medical need in organ shortage and end-stage liver disease:

- Addressing organ shortage: Contributing to solutions for organ shortage and improving outcomes for patients with end-stage liver disease.
- Cross-disciplinary integration: Combining expertise across transplantation biology, clinical hepatology, and regenerative medicine to strengthen Europe's position in advanced therapeutic development.
- More sustainable healthcare systems: Exploring alternatives and complements to full organ transplantation, which remains resource-intensive and limited in availability.

Overall, NEOLIVER aligns with EU priorities on regenerative medicine, advanced therapeutics, and sustainable, equitable access to transplantation alternatives.

4. As an applicant, what advice would you have wanted in the Horizon project design process? What support did you receive from National Contact point (NCP) and your organisation, and what improvement of support would you benefit from?

Advice for applicants:

- Clearly articulate the clinical need and translational pathway from the outset, particularly for projects involving advanced therapies.

Build a consortium with strong clinical integration and access to patient material.

National Contact Point provided useful guidance on aligning the proposal with the call requirements, while institutional support teams assisted with coordination and administrative aspects. Additional early-stage support in shaping impact pathways and regulatory considerations for clinical translation would be highly valuable.

5. Please highlight aspects of your Horizon project's strengths that you consider important and that may constitute good practice for other applicants.

NEOLIVER includes several elements that represent good practice for Horizon projects:

- Strong translational focus: Links fundamental insights in liver regeneration directly to clinical application in transplantation settings.
- Multidisciplinary consortium: Combines leading expertise in surgery, hepatology, and regenerative approaches, ensuring feasibility and relevance.
- Well-defined clinical implementation pathway: Benefits from clearly defined pathways towards clinical implementation.
- Cross-country, cross-disciplinary collaboration: A clear strategy for collaboration across disciplines and countries, essential for addressing complex healthcare challenges at the European level.



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