IMPACT SUCCESS STORIES

HNN 3.0
HEALTH-NCP-NET

KeratOPrinter aims to develop a 4D bioprinting suite, centred around regenerative medicine and tissue engineering, that can deliver a fully functional, biocompatible, full-thickness native-like human cornea.

By leveraging iPSC-derived corneal cells, bioinks, and advanced 3D bioprinting technologies, KeratOPrinter aims to enhance the precision, scalability, and accessibility of biofabricated tissues for ophthalmology.

KeratOPrinter

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

   Keywords: 3D bioprinting, laser assisted bioprinting, melt electrowriting (MEW), bioinks, human induced pluripotent stem cells, cornea, blindness, epithelium, stroma, endothelium, ATMP, regulatory pathway, logistics.

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

   Technologies for the production of corneal epithelial, endothelial, and stromal cells from induced pluripotent stem cells (iPSCs), including preliminary CMC concepts for GMP-compliant manufacturing;
   3D bioprinting technologies enabling the production of clinical-grade corneal tissues;
   Design of regulatory pathways for 3D bioprinted tissues classified under combined ATMP regulations, supporting first-in-human clinical trial application design;
   Safety evaluation and proof-of-concept studies for the initial target clinical indications using 3D bioprinted corneal tissue;
   Regulatory pathway analyses supporting a first-in-human clinical trial application planning;
   Commercialisation and market access strategies for 3D bioprinted tissues and related technological solutions developed in the project.

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

   KeratOPrinter strengthens Europe's scientific and technological expertise in advanced healthcare by developing next-generation bioprinting solutions for corneal regeneration. Through targeted research innovation, the project delivers safe, sustainable, and cost-effective therapeutic approaches to address a major unmet medical need. By advancing bioprinting technologies towards GMP-ready, scalable deployment, KeratOPrinter reinforces the EU health innovation ecosystem and supports healthcare providers, industry, and academia. The project also enhances Europe's strategic autonomy and global standing in regenerative medicine and personalised therapies, while fostering international cooperation and knowledge exchange. Through ethical, transparent, and responsible innovation, KeratOPrinter builds public trust in emerging health technologies and contributes to resilient, sustainable health systems delivering long-term societal and economic value.

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?**

   We did not seek support from a National Contact Point (NCP).
   The Faculty of Medicine and Health Technology at Tampere University provided support that enabled the use of an experienced grant writer with whom we had collaborated previously. This prior experience made the grant-writing process highly efficient and collaborative. Professional grant-writing support is considered essential, as preparing a competitive EU proposal requires far more than excellent scientific content alone; dedicated expertise is needed to address the overall complexity of the process.
   As this is my first experience in an EU project coordinator role, support from the home organisation in administrative matters is particularly important.

The level and quality of this support exceeded my expectations. Earlier awareness of such support structures might have significantly lowered the threshold for taking on the proposal coordinator role.

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

Our consortium is highly multidisciplinary, bringing together cell biologists, engineers of different disciplines, clinicians, regulatory experts, and communication specialists, each with clearly defined roles and responsibilities. Several partners have a history of collaboration, which enabled a smooth and efficient project start up. In addition, the involvement of new partners with dedicated expertise was essential and these were identified through established professional networks and recommendations.

Given the high regulatory demands associated with the medicinal product under development, the inclusion of a regulatory expert as a project beneficiary is critical. Likewise, a dedicated dissemination partner is essential, allowing all partners to focus on their core areas of expertise and ensuring efficient use of time and resources.

The project is structured in multiple complementary layers that contribute to the overall objectives. This design provides built-in flexibility, allowing progress through alternative strategies if certain tasks face delays or technological challenges. Moreover, the nature of the project enables significant technology development across several areas, ensuring the generation of valuable scientific and technological outcomes.

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