TOPIC DESCRIPTION

- Topic ID: HORIZON-CL4-2024-RESILIENCE-01-36
- Title: Advanced biomaterials for the Health Care
- Call: Resilient value chains 2024 two-stage
- Deadline: Phase 1: 07/02/2024
  Phase 2: 24/09/2024
- Topic budget overview: 31 M€ (4 projects will be funded with 6-8M€)
- Type of action: Innovation Action (IA)
- TRL: From 3/4 to 5/6
- Topic link: Funding & tenders (europa.eu)

THE PROJECT

EXPECTED OUTCOMES

- Projects are expected to contribute to the following outcomes:
  - Develop the swiftly growing innovation market of medical applications, which is dependent on **advanced biocompatible materials that can be printed or injected**, including **4D materials that change their 3D structures** following external impact (e.g., thermic, electric, mechanical or radiation treatment).
  - Medical and/or surgical procedures will benefit from **injectable materials** for **non-invasive surgical procedures**.
  - Some of their advantages include easy deliverability into the body, increased implantation precision, controllable release of therapeutic agents, antimicrobial properties and the possibility of monitoring or stimulating biological events.
- Medical suppliers can commercialise **injectable hydrogels**, including those made of nanocomposite, natural and synthetic polymer-based biomaterials, bone cements, bio-ceramics, and electronics.

SCOPE

- Proposals should address at **least four** of the following activities:
  - To enable a fast development of new advanced **novel injectable biomaterials**, digital tools such as modelling, simulation, and characterisation techniques (including those provided by analytical infrastructures) assisted by advanced methods e.g., physics-based methods, machine learning or artificial intelligence.
  - The innovation market of medical applications is fast growing and dependent on **advanced biocompatible materials that can be printed or injected**. The **4D materials** will change their 3D structures after external impact such as thermic, electric, mechanical or radiation treatment.
  - Proposals shall demonstrate **new engineering strategies** that present functional characteristics beyond biocompatibility, and express properties that can be used to control the physiological environment (**shape-memory**, self-healing properties) and induce a response.
  - Proposals shall address **biomaterials with antibacterial properties** contributing to the widespread bottleneck of antimicrobial resistance often encountered in clinical care.

  - Demonstrate the **scaling of injectable hydrogels**, including those made of nanocomposite, natural and synthetic polymer-based biomaterials, bone cements, bio-ceramics, and electronics.
  - The **design for circularity** must develop, when relevant, bio-degradable or bio-absorbable biomaterials that are gradually eliminated by the body after fulfilling a purpose.
- The biomaterials used should be **safe and sustainable by design (SSbD)**, taking also into account any specific medical requirements.

OTHER REQUIREMENTS

- Effective contribution of Social Sciences and Humanities (SSH) disciplines and involvement of SSH experts. An **early involvement of end users** could be essential.
- Proposals should include a business case and exploitation strategy.
- Collaboration with existing projects and develop synergies with other relevant European, national, or regional initiatives, funding programmes and platforms.
- Seek links with and capitalize on the results of past and ongoing EU funded research projects, including the ones under **Cluster 1** "Health" and **Cluster 6** 'Food, Bioeconomy, Natural Resources, Agriculture and Environment.

CONFIRMED PARTNERS

1. **Fraunhofer Institute for Applied Polymer Research (IAP)** – Germany
2. **Nottingham Trent University** – UK
3. **University of Patras** – Greece
4. **University of Leeds** – UK
5. **Leitat Technological Centre** – Spain
6. **NETO Innovation** – France

MISSING EXPERTISE

1. **Material producer:** A company that specializes in the production of medical-grade raw materials. Ensure that the materials used are biocompatible, non-toxic, and align with the sustainability criteria of the EU call.
2. **Medical supplier:** Medical grade hydrogels developer. Enhance the project's practicality, market orientation, and regulatory compliance, significantly contributing to its potential for success and impact in the healthcare market.
3. **SSH (Social Sciences and Humanities) expert:** To ensure the early involvement of end-users, a patient advocacy group or a representative body of healthcare providers could provide insights into patient needs and clinical workflows.
4. **Regulatory and Compliance Specialist**: A legal firm or consultancy with experience in EU regulations related to healthcare and medical devices, to guide the project through the necessary regulatory pathways and ensure compliance.