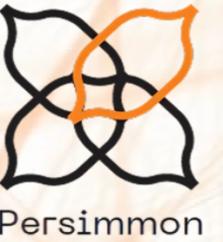# Persimmon

Personalized Sustainable Smart Patch Omnificence

Project Details

Project number: 101129713

Project name: PERSONALIZED SUSTAINABLE SMART PATCH OMNIFICENCE

Project acronym: PERSIMMON

Topic: HORIZON-CL4-2023-RESILIENCE-01-33

Type of action: HORIZON-RIA

Project starting date: 1 September 2024

Project duration: 48 months

EU Contribution: 7 768 776.26 €

These patches will enable real-life health monitoring.

Project Partners
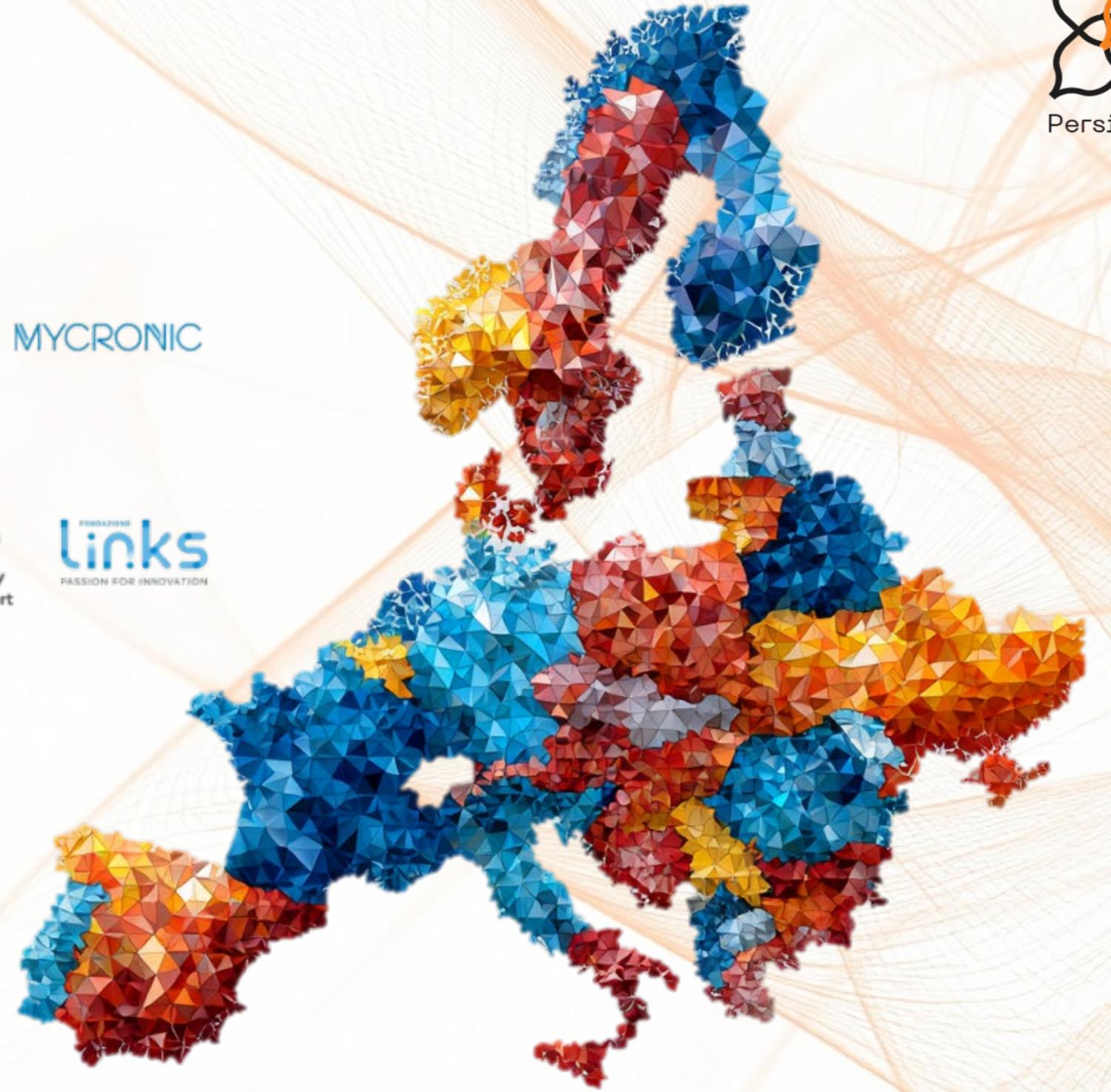
Advancing the circular economy in wearable health tech

By integrating cutting-edge technologies like edge-AI and bodyNET communication, PERSIMMON will deliver low-power, high-performance devices that offer continuous monitoring for various health conditions. This innovation will significantly reduce the data-driven carbon footprint and enhance sustainability by using green materials and clean recycling methods. The project also addresses concerns over critical materials like gallium, contributing to the EU's Net-Zero Industry Act and Critical Raw Materials Act.

Objectives

Persimmon
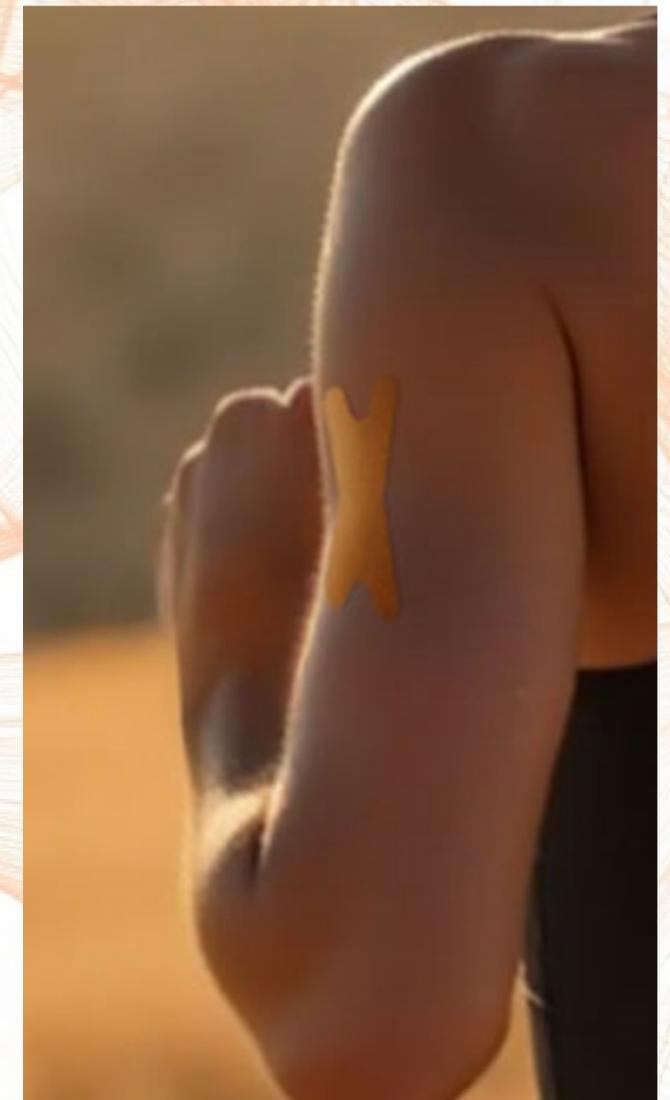
Develop Biodegradable Smart Patches For Circular Economy

To develop soft and compliant printed wire boards with biodegradable biopolymers for circular economy.

Create A Multimodal BodyNET With Edge-AI For Power Efficiency

A bodyNET with physical and physiological sensors, reducing motion artefacts, supporting high sampling rates, and using reusable modules. Activity classification accuracy above 90-95%.

Develop AI-Enhanced Body Temperature Monitoring

AI-driven real-time body temperature monitoring, accuracy within 0.5°C of lab-grade sensors, adaptable algorithms.

Integrate Continuous, Non-Invasive Blood Pressure Monitoring

Cuffless, continuous blood pressure monitoring with 5 mmHg accuracy, MAE of 5-10% during stress.

Secure Cloud Data Transfer With Fat-IBC And 5G Gateway

Secure, high-speed data transfer (50k samples/s) via Fat-IBC and 5G gateway

Expected impacts

The main objective of **PERSIMMON** is to provide, based on digital surface mount technology (SMT):
- low-cost additive manufacturing of smart patch networks that are personalized
- improved applicability in remote personal health monitoring
- improved sustainability and circularity.

The objective builds on the European strength in SMT to leverage our capacity in printed circuit board (PCB) manufacturing and especially such for advanced use in wearables and biomedical engineering. The project will be enabled it by several materials specifications and related innovations in renewable and recyclable materials, biobased active ingredients and design for circularity.

Sustainability
Eco-friendly smart patches reduce environmental impact through recyclable materials and low power consumption.

Healthcare Innovation
Continuous, non-invasive health monitoring offers improved patient care and proactive management of conditions like cardiovascular disease.

Technology Advancement
PERSIMMON's innovations will set new standards in wearable tech by combining advanced AI, biodegradable materials, and cutting-edge sensors.

Circular Economy
By focusing on recyclability and reducing electronic waste, the project aligns with global sustainability goals for a greener future.

Methodology

Life Cycle Analysis (LCA), Societal Uptake, and Compliance

This aspect integrates sustainability into the design process, focusing on user acceptance, circular economy practices, and socio-technical feedback from stakeholders through workshops and interviews. It ensures that smart patches are designed with environmental impact and user needs in mind.


Technological Development

The project advances in material science, using liquid metals, biodegradable hydrogels, and biopolymers to create eco-friendly smart patches. Innovations include liquid gallium circuits, biopolymer substrates, and sustainable manufacturing with design-for-recycling principles. Edge-AI electronics will enable ultra-low-power biometric data collection, and Fat-IBC technology will enhance wireless communication through the human body.

bodyNET System Testing and Demonstration

PERSIMMON will test the technology in real-world applications like sports and home care, focusing on adaptability and sustainability. System tests will align with circular economy goals, while demonstrations will showcase personalized bodyNETs for cardiac and health monitoring, utilizing AI for real-time analysis.
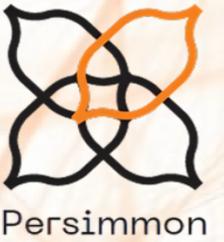
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Social Media

Follow us!

in **@persimmon-project**

https://persimmon-project.eu/

Contacts

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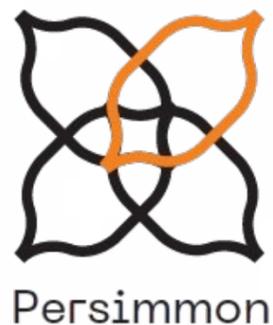Leads the project, ensures milestones are met, manages reporting, and liaises with the funding authority.

Isella Vicini
Tinexta Innovation Hub
Dissemination Manager
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Handles outreach, communication tools, and visibility of project results across channels and stakeholders.

Personalized Sustainable
Smart Patch Omnificence

Thanks for your attention!

www.persimmon-project.eu