PULSE is an HORIZON PROJECT and EUGREEN PARTNER

ACRONYM	PULSE
TITLE OF THE PROJECT	3D PRINTING OF ULTRA-FIDELITY TISSUES USING SPACE FOR ANTI-AGEING SOLUTIONS ON EARTH
ROLE IN THE PROJECT	Partner
CALL	HORIZON EIC Grants, EIC Pathfinder, HORIZON-EIC-2022-PATHFINDEROPEN-01-01
WEBPAGE	Research platform: https://forschung-sachsen-anhalt.de/project/d-printing-ultra-fidelity-tissues-using-25968
STARTING - END DATE	01.04.2023-31.03.2028
PI	PI OVGU Prof. Daniela Grimm, Coordinator-PULSE Prof. Lorenzo Moroni, Maastricht
PROJECT BUDGET	3.997.578,75€
EUGREEN PARTNER BUDGET	479.996,25€
NUMBER OF PARTNERS	7
OBJECTIVE (FEW LINES)	In PULSE, we aim to develop a radical new bioprinting technology based on multiple levitation principles and to use space as an accelerator of ageing on Earth. As a proof of concept study, we will use this newly developed bioprinting technology to create cardiac 3D in vitro models able to better mimic cardiac physiology compared to organoids. We will use such models to study cardiac ageing and test the efficacy of antiinflammatory/ anti-oxidative drugs with anti-ageing potential.
WHY IS CONSIDERED A GOOD PRACTISE? (FEW LINES)	Over the recent decades it could be shown that microgravity promotes the 3D-growth of both healthy and malignant cells without the necessity for scaffolds. Utilizing these advantages for bioprinting will allow for the development of a unique device that will facilitate the generation of bioprinted tissue material with complex structures and exceptional quality.
IMPACT OF THE PROJECT (FEW LINES)	Bioprinting in space is one of the novel promising and perspective research directions in the rapidly emerging field of biofabrication. There are several advantages of bioprinting in Space. First, under the conditions of microgravity, it is possible to bioprint constructs employing more fluidic channels and, thus, more biocompatible bio-inks. Second, microgravity conditions enable 3D bioprinting of tissue and organ constructs of more complex geometries with voids, cavities,

Co-funded by the European Union

Do something EUGREEN today!

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Union or European Education and Culture Executive Agency (EACEA). Neither the European Union nor the granting authority can be held responsible for them.

	and tunnels. Third, a novel scaffold-free, label-free, and nozzle-free technology based on multi-levitation principles can be implemented under the condition of microgravity. The ideal space bioprinters must be safe, automated, compact, and user friendly. Thus, there are no doubts that systematic exploration of 3D bioprinting in space will advance biofabrication and bioprinting technology per se. Vice versa 3D bioprinted tissues could be used to study pathophysiological biological phenomena when exposed to microgravity and cosmic radiation that will be useful on Earth to understand ageing conditioning of tissues, and in space for the crew of deep space manned missions. In PULSE, we aim at developing a radical new bioprinting technology based on multiple levitation principles and to use space as an accelerator of ageing on Earth. As a proof of concept study, we will use this newly developed bioprinting technology to create cardiac 3D in vitro models able to better mimic cardiac physiology compared to organoids. We will use such models to study cardiac ageing and test the efficacy of antiinflammatory/ anti-oxidative drugs with anti-ageing potential.

Co-funded by the European Union