



Factsheet

ACRONYM	cmRNAbone
FULL TITLE	3D Printed-Matrix Assisted Chemically Modified RNAs Bone Regenerative Therapy for Trauma and Osteoporotic Patients
PROGRAMME	Horizon 2020/ SC1-BHC-07-2019/ Regenerative medicine: from new insights to new applications
CONTRACT NUMBER	874790
ABSTRACT	<p>Due to life style changes and ageing of our industrialized nations, bone traumatic injuries and osteoporosis induced fragile fracture are an enormous medical and socio-economic challenge. State-of-the-art therapies have failed until now in keeping their promises of reliable bone regenerative solutions. The cmRNAbone project aim to create a novel bone regenerative therapeutic approach based on combination of chemically modified RNAs (cmRNAs)-vectors embedded in a 3D-printed guiding biomaterial ink tailored to patients need. To achieve our goal, sema3a, vegf, pdgf-bb and bmp7 cmRNAs targeting neurogenesis, vasculogenesis and osteogenesis will be synthesized, vectors based on lipids and polysaccharide nanocapsules for the delivery of cmRNAs will be developed. A functional Hyaluronan-Calcium Phosphate biomaterial ink that 1) can be loaded with cmRNAs-vectors and release them, 2) having intrinsic osteoinductivity and presenting laminin-derived peptides for guiding sensory neurons and endothelial cells ingrowth, and 3) being amenable to an extrusion-based 3D-bioprinting process will be formulated in conjunction to a 3D-printer for fabrication of patient specific regenerative solution. In the following step, a large effort will focus on deciphering regenerative mechanisms and optimizing dosage and ratio of cmRNAs, loading of cmRNAs-vectors in the ink, 3D-printing, etc, to demonstrate regenerative capabilities in vitro and in vivo. Selected candidate formulations will be taken to clinically relevant preclinical proof of concepts. Finally, an overreaching effort on preparing a 1st in human trial will be taken, consisting on partners facilities auditing and clinical experts group support, etc, to ensure that GMP-like production for all regenerative tools, and regulatory and commercial strategies are realized.</p>
DURATION	48 months (01/01/2020 - 31/12/2023)
PROJECT FUNDING	6.256.758,75 €



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