

Launch of EU Research Project cmRNAbone: Novel Gene Therapy for Bone Regeneration

New treatment for patients with large traumatic injuries and osteoporosis

Davos, Switzerland, 4 February 2020 – Launched on 1 January 2020, the EU research project cmRNAbone has set out to develop a novel bone regenerative therapy for trauma and osteoporosis patients. The researchers plan to develop chemically modified RNAs and a specific vector delivery system to be embedded in a biomaterial formulation tailored to the patients' needs. Over the next four years, the 11 European partners will receive EUR 6.3 million funding from the European Union's Horizon 2020 Framework Programme.

Due to demographic change, bone degenerating diseases like osteoporosis have a growing societal and financial impact on industrialised nations. It is estimated that worldwide one in three women and one in five men over the age of 50 will experience osteoporotic bone fracture. Moreover, although most fractures will heal without complications under appropriate treatment, there are additional cases of impaired bone regeneration, e.g. large trauma with infections after car accidents.

With bone being the most transplanted tissue after blood, the need for graft materials is enormous. In search of optimised regeneration solutions, the EU-funded cmRNAbone project has set out to develop a novel gene therapy to improve the lives of people with large traumatic injuries or bone degenerating diseases such as osteoporosis.

The proposed approach is a unique combination of genetic research, advanced nano- and biotechnology and 3D-printing: Making use of recent scientific discoveries related to RNA therapeutic agents, the consortium aims to develop chemically modified RNA encoding specific proteins targeting neurogenesis, vasculogenesis and osteogenesis – three major processes influencing the healing progression. The produced RNA sets will be combined with non-viral vectors for the RNA delivery to be embedded in a biomaterial ink formulation. The use of a specifically designed 3D-printer for the implant will help to demonstrate the bone regenerative capabilities in practice.

“One of our top priorities is the timely translation of the project results to the clinic”, said Prof David Eglin, Principal Investigator at the AO Research Institute Davos and Coordinator of cmRNAbone. “To reach our ambitious project goals and achieve more effective patient care worldwide, we need a balanced team combining the innovation potential of SMEs with the market experience of research institutes and the large international track records of our participating universities and university hospitals.”

The new findings will be applied in two parallel pre-clinical studies to demonstrate clinical relevance and validity of the designed therapeutic in osteoporotic and critical size bone defects. Supported by a clinical and scientific advisory board, the largely SME-driven consortium will insure facile and rapid translation to the clinic beyond the end of the project. In the long run, the discoveries could not only be a new regenerative approach in large bone defect and fragile fractures in the young and ageing population, but also to other major diseases affecting millions of patients.

The cmRNAbone consortium comprises 11 European partners from Austria, France, Germany, the Netherlands, Spain and Switzerland. On 4-6 February 2020, they come together for the official project kick-off in San Sebastián, Spain.

Project Key Facts

Title: cmRNAbone – 3D Printed-Matrix Assisted Chemically Modified RNAs Bone Regenerative Therapy for Trauma and Osteoporotic Patients

Start: 1 January 2020

Duration: 48 months

Budget: 6,256,758.75 €

Coordinator: AO Research Institute Davos, Switzerland

Project Partners

- AO Research Institute Davos, Switzerland
- Ethris GmbH, Germany
- EURICE – European Research and Project Office GmbH, Germany
- Fundación Cidetec, Spain
- Fundación Idonial, Spain
- Kuros Biosciences, Netherlands
- Universität Basel, Switzerland
- Université de Bordeaux, France
- Universiteit Maastricht, Netherlands
- OZ Biosciences SAS, France
- QBEX GmbH, Austria

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