

EDITORIAL

Editorial TriAnkle project



TriAnkle is an innovative medical application that aims to improve the junctions and cartilages (and therefore, the overall movement) of the ankle by introducing a tailored, 3D bioprinted collagen- and gelatin-based structure in the affected area.

Why TriAnkle? In the past 30 years, the progress in the fields of tendon, ligament and cartilage regeneration has not been very impressive. Together with muscle injuries, the damages to these connective tissues are still the main causes long-term sick leave in elite athletes and one of the main causes of loss of mobility in elderly people.

How is it going to work? Collagen is not only the most abundant protein in the human body, but it is also an integral component in the structure of the connective tissues. By introducing a collagen based implant with regenerative factors, these connective tissues can heal vastly faster, reducing the recovery time down to 50%, as well as increasing the recovery ratios of ankle joints up to 15%.

Who will benefit from this project? There are two case-studies in which TriAnkle can be implemented: osteochondral cartilage injuries and partial ruptures of Achilles tendon. Within these medical problems, TriAnkle is designed to adapt to anyone who needs it fast and efficient recovery of ligaments, tendons and cartilage, ranging from young athletes to seniors. Besides athletes who frequently suffer these kinds of injuries and are exposed to progressive joint degeneration, but there are also up to 500 million people in the world that are adversely affected by osteoarthritis, especially elderly population. The application of the TriAnkle therapies will improve social reintegration of patients with diseases of weight-bearing joints, increase the employability and work performance of people with high physical activity, such as construction workers, physiotherapists or athletes. Fast and good recovery is of high economic and social importance for these patients.

A personalized approach for a patient-centered vision: TriAnkle seeks to fill a critical gap in treatment as well as a faster and enhanced healing process. With that objective, the project will develop therapies that adapt to different types of patients. Their needs will be assessed through

workshops to guide the innovation process. To satisfy the patients' needs TriAnkle will use 3D Printing technologies that can allow creation of patient-specific tissue constructs. Additionally, the project will use biomaterials functionalized with growth factors and/or stem cells in order to make the tissue healing/integration process even more efficient. Elite athletes or osteoarthritic patients will have very different healing needs that translate into different products.

The project, financed by the EU and aimed at improving the quality of the life of millions, is made possible thanks to a vast number of partners. Viscofan BioEngineering and Cellink are the industry partners, and various associates, such as FC Barcelona Innovation Hub, Osteoarthritis Foundation International (OAFI), Fraunhofer IGB, University of Stuttgart, Universidad del País Vasco (UPV), Eindhoven University of Technology, Leitat technological center, Cambridge Nanomaterials Technology (CNT), Gradocell and Fundació Clinic per a la Recerca Biomèdica [Figure 1](#).

TriAnkle consortium

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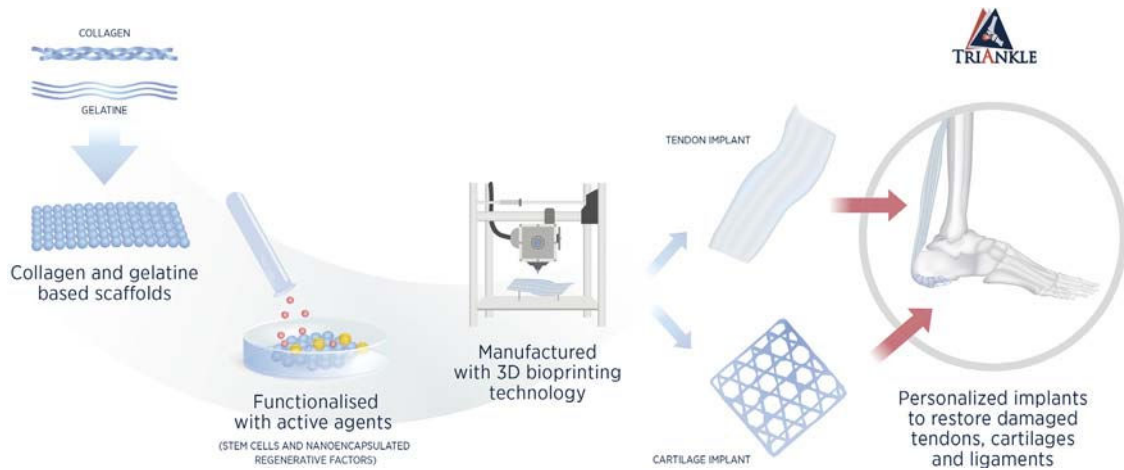


Figure 1 Schematic representation of TriAnkle's therapeutic approach.

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