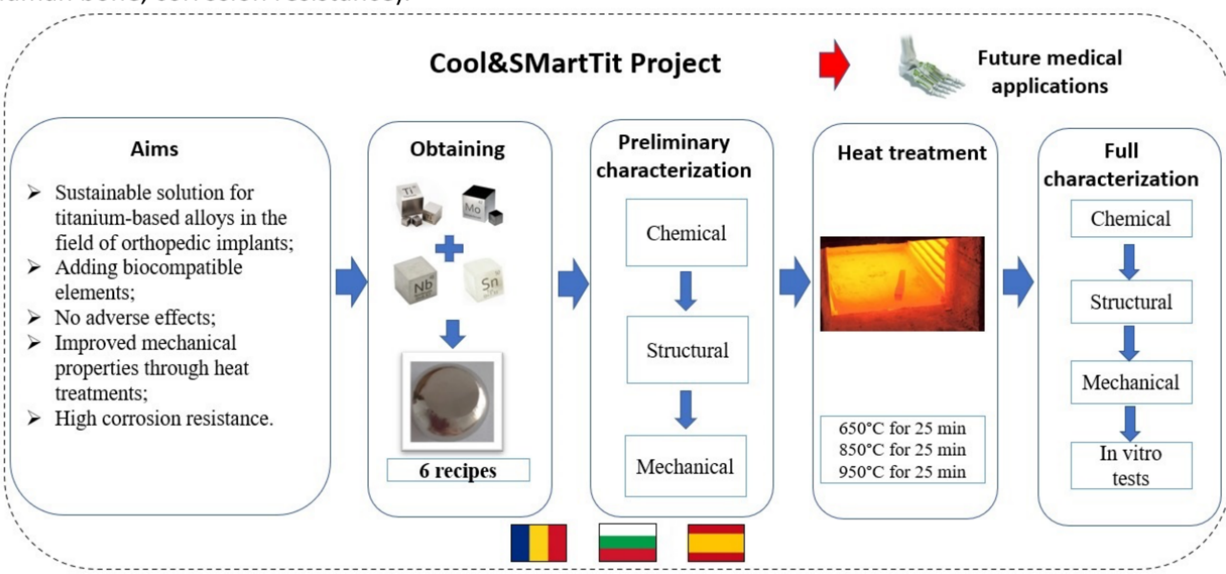
A new generation of metallic biomaterials as health solution for a sustainable life / (Cool&SmartTit)

The project is aimed at obtaining new alloys system containing Titanium, Molibdenum, Niobium and Tin (Ti-Mo-Nb-Sn) - eight alloys -, with characteristics suitable for medical applications. The new generation of biomaterials will overcome the limitations of the titanium, cobalt and stainless steel alloys as: high elasticity model and low corrosion resistance and biocompatibility. Hence, to achieve long-term stability and rapid osseointegration in orthopedic implants, surface modification of the implant surface is required. In this sense, the new titanium-based alloys will undergo specific heat treatments to obtain alloys with good mechanical properties intended for orthopedic applications.

The main objectives are:

1. Sustainable solution for alloys system development based on theoretical simulation of thermodynamic aspects according to the equilibrium diagrams using specific software.
2. Complete assessment of metallic alloys before and after heat treatment contributing as a health solution for a sustainable life.
3. Enhancement of obtained bio-alloys by thermal treatment and advanced characterization in order to respond to human body and market demands in a circular economy.

The results of the project focus on development of competitive products with improved characteristics and impact in medicine, respectively human wellness and health. The alloys developed within the project will be innovative new products with advanced multifunctional properties (hardness, elasticity close to human bone, corrosion resistance).



The success of the project is ensured by the quality of the human resource, the state-of-the-art material base, as well as the dissemination of the experimental results in international conferences or workshops in the field, respectively by opening new collaborations of the research team from: TUIASI - “Gheorghe Asachi” Technical University of Iasi (P1), INCDPM - National Institute for Research and Development in Environmental Protection (P2), UCAM - Fundación Universitaria San Antonio de Murcia, Spain (P3), UCTM -University of Chemical Technology and Metallurgy from Bulgaria (P4). The implementation of the project is based on cross-collaboration between materials scientists and bioscientists.