

Research Project

The main objective of the research project regards the development of a framework to quantify the 3D left atrium (LA) wall motion model on a patient specific basis, in an atrial fibrillation (AF) population. In view of a personalized approach for AF, the availability of a realistic model of LA motion is one of the main open issues to ensure a realistic 3D patient-specific model of the left atrium. The assessment of the LA motion in sinus rhythm and AF is a key factor contributing towards a comprehensive understanding of AF mechanisms, treatment outcome improvement and complication prediction. The aim of this project is the development of an automatic procedure in order to compute the patient specific LA wall motion model and use this information to predict clot formation.

Expected results include the design and development of a novel approach for a personalized LA motion estimation based on the application of advanced image segmentation and registration techniques in order to automatically compute the patient-specific LA deformation throughout the cardiac cycle in AF patients.

Activity Plan

The early stage researcher will be enrolled at the University of Bologna in the “Biomedical, Electrical and Systems Engineering” PhD Programme. The activities will be carried out at the Campus of Cesena and the researcher will spend several months at

partners of the project consortium including one month at the Institut d'investigacions Biomèdiques August Pi i Sunyer for the quantification of flow phenotypes with in vivo measurements, two months at Galgo Medical for atrial shape quantification, two months at the Universitaets-Klinikum Freiburg for clinical management of anticoagulation and two months at the Simula Research Laboratory for the integration of the 3D motion model and of the computational workflow developed to simulate blood flow and predict clot formation.