



HPC simulations of cardiac electrophysiology using patient specific models of the heart (using CHASTE and Alya)

22 November 2017, 12 pm CET / 11 am GMT (1 hour duration)

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The webinar will be run by the **Computational Cardiovascular Science team (CCS)** of the **University of Oxford** (www.cs.ox.ac.uk/ccs) and will provide an insight of the latest research in the CCS group on High Performance Computational (HPC) simulations of cardiac electrophysiology using patient specific models of the whole heart. The group has developed an **image analysis and computational pipeline for the personalisation of anatomically-based human heart-torso models**, from MRI data, generation of volumetric meshes, to patient-specific simulations of human heart function and ECG reconstruction. Regarding the electrophysiological simulations from ionic level up to the whole organ and body surface, we will focus on two well-known simulation softwares, Chaste and Alya. The finite element CHASTE software (Cancer, Heart And Soft Tissue Environment; www.cs.ox.ac.uk/chaste) has been developed at the Department of Computer Science, University of Oxford and the Alya System is the Barcelona Supercomputing Simulation code for high performance computational multi-physics.



Ana Mincholé (*Senior researcher in Computational Cardiovascular Science*) received her PhD in Biomedical Engineering from the University of Zaragoza (Spain, 2011), on automatic detection of ischaemia and new arrhythmic risk biomarkers. In 2012, she joined the Oxford's CCS Group under the award of a Marie Curie Intra-European Fellowship for Career Development. Within the CCS Group, she has conducted large HPC studies using CHASTE on ARCHER in vulnerability to arrhythmias under ischaemic disease conditions, and she has largely contributed to the development of the imaging analysis and computational pipeline for personalised human-torso models. Ana's research interests include cardiac electrophysiology modelling and simulations, and biomedical signal and image analysis with the aim to understand mechanisms and provide biomarkers for cardiac diseases making use of in silico simulations and patient-specific data.

Francesc Levrero-Florencio (*Research Associate in Computational Cardiovascular Science*) finished his PhD in Civil Engineering at the University of Edinburgh in the topic of multiscale solid mechanics and HPC applied to trabecular bone, where he also developed a nonlinear version of ParaFEM, supported through an ARCHER RAP award. Francesc joined the CCS Group in November 2016 as part of the CompBioMed project, in close collaboration with the Barcelona Supercomputing Center. His research topic is the study of the multiscale electromechanical behaviour (contractility) of the human heart under healthy and diseased conditions.



This webinar series is run in collaboration with the VPH Institute

