

PREFACE

We are delighted to welcome you to the Virtual Physiological Human Conference (VPH2018). The Congress will take place from 5th to 7th September 2018 in the Edificio Betancourt at the Campus Rio Ebro from the University of Zaragoza. This building is part of the of the Faculty of Engineering and Architecture (EINA) where daily more than 6000 students and 650 faculties develop their activity.

The VPH2018 Organizing Committee, representing the VPH Institute with the Aragón Institute of Engineering Research (I3A) will carry out this VPH2018 Conference. This event, which has taken place since 2010, will develop its 5th edition in Zaragoza.

The aim of the VPH2018 conference is to encourage scientific and technological researchers as well as industrial professionals from all over the world to present their novel research results and new technological developments. The proposed theme for the conference is “VPH for In Silico Medicine”. Actually, the conference will position VPH community in the broader context of In Silico Clinical Trials, contributing to advance in the most relevant challenges, from the development of novel technologies to its clinical application. In-Silico Medicine will help to reduce, refine, and partially replace animal experiments. In fact, in-vitro and in-vivo research tools should be complemented by in-silico technology. Indeed, the aim of VPH conference is to contribute to address In Silico Medicine as a closer reality.

The VPH2018 conference has been conceived in order to achieve a forum of scientific discussion, but also to find synergies between the academy and the industry. Therefore, to achieve it we have a collection of researchers of renowned prestige organized as follows: three Keynote Speakers, eleven Invited Speakers and 200 Regular Speakers. In addition, the contribution of Industry is very relevant with a total of six innovative companies on the field of personalized medicine, whose participation will be very active and enriching. Actually, we have planned a Plenary Industry Session and a total of three parallel sessions led by these industry partners.

Students are the present and the future of the VPH community, so, a wide program of activities have been designed for them: pre-courses, workshops, mentoring program, research career in Europe, contact with industry and Social Events.

The Organizers would like to thank all of the authors, speakers and participants who will make this conference so interesting and enjoyable. Some special thanks should also be extended to the session chairs and to the reviewers who gave of their time to evaluate the record number of submissions on a short period of time. Finally, it is appropriate that we also thank to our Industry Sponsors that will create a more interactive and technological environment.

We thank you all for your participation in VPH2018 and we are glad to host you in Zaragoza for a few days. Looking forward for an exciting conference.

JM. García-Aznar
MA. Pérez
MJ. Gómez-Benito

The VPH Institute: Building the Virtual Physiological Human

The VPH Institute is a non-profit organization whose mission is to ensure that the Virtual Physiological Human (VPH) is fully realised, universally adopted, and effectively used both in research and clinic. The VPH domain, also identified with the word “in silico medicine” is the discipline that encompasses the use of individualised computer simulations in all aspects of the prevention, diagnosis, prognostic assessment, and treatment of a disease and development of a biomedical product. The VPHi’s goal is to make sure of pursuing the necessary R&D to integrate quantitative biological knowledge from molecular to cell, tissue, organ and whole body scales and to translate this understanding into clinical practice.

Since its establishment in 2011, the Institute has been constantly growing its membership and recognition, and now represents the interest of over 70 academic institutions and research groups world-wide focused on the development of in silico medicine through the application of VPH technologies. The VPHi acts as a catalyst to bring together a variety of different stakeholders (such as policy makers, science funding bodies, regulatory agencies, clinical organisations and industry) in order to maximise the benefit of VPH approaches for the healthcare industry and for the public good. The biannual VPH conference, organised by the VPHi, has become an important forum for the dissemination of the in silico medicine research achievements across the world, ensuring the research efforts are aligned and maximised. The fourth issue of the conference, VPH2020, will take place in Paris on 26-28 August 2020 and you’re all invited to attend!

Over the years, the VPHi has successfully built the recognition of the value of the VPH research at political level, creating strong and continued links with both the European Commission and the Parliament. Thanks to these efforts, in 2014 the European Parliament endorsed VPH as an example of a successful eHealth solution and provided continued funding of VPH research activities in the Horizon 2020 work programme. The VPHi has now a key official role in shaping European eHealth policies, having been appointed by the EC as a member of the eHealth Stakeholder Group, a platform of 30 stakeholders that contributes to the development and implementation of policy related to eHealth.

Thanks to its privileged access to a large community of experts, the VPHi successfully contributed to the development of two important roadmaps: the Roadmap for the Digital Patient (Discipulus CSA) and the Roadmap for in silico clinical trials (Avicenna CSA). Out of the Avicenna CSA, the VPHi created an Industry-Academia Association to increase the collaboration between academia and the industries in the in silico medicine field so to ensure a faster adoption track of VPH research technologies. This association, the Avicenna Alliance, is now up and running and the VPHi seats on its board detaining a 50% representation.

The VPH Institute also offers added value to PhD students planning to develop a career in the VPH field. It has implemented a number of training activities such as the annual VPH Summer School and the VPHi Keynote Webinar series that provides a forum for access for young scientists to senior community members and their expert competence.

If you share our vision and interest in making in silico medicine a reality, you should seriously consider joining the VPH Institute. Your support will not only be instrumental in contributing to the transformation of current biomedical R&D, but it may also improve the quality and the scope of your own R&D and expand your funding base.

WEDNESDAY, SEPTEMBER 5TH

08:30-09:00 Session 1: Opening Ceremony

LOCATION: [Plenary Room, Marco Carrera](#)

CHAIRS: - **José Antonio Mayoral**, Dean of the University of Zaragoza.

- **Liesbet Geris**, Director of VPH Institute.
- **José Ángel Castellanos**, Director of the EINA.
- **Ignacio Garcés**, Director of I3A.
- **Pilar Alegría**, Government of Aragón

09:00-10:00 Session 2: Plenary speaker I

CHAIR: [Liesbet Geris](#)

LOCATION: [Plenary Room, Marco Carrera](#)

09:00	Alfio Quarteroni Numerical models for the heart function
-------	--

10:00-10:30 Coffee Break

10:30-12:30 Session 3A: Cardiovascular modeling: from simulation to clinical outcome organised by E-cardiology I

CHAIRS: [Belen Casas](#) and [Esther Pueyo](#)

LOCATION: [Plenary Room, Marco Carrera](#)

10:30	Laura Martinez , Lucia Romero , Omer Berenfeld , Jose Jalife and Javier Saiz Phase maps based on the electrograms from basket catheters might generate false rotors SPEAKER: Javier Saiz
10:45	Jordi Cano , Lucia Romero , Julio Gomis-Tena , Beatriz Trenor , Ferran Sanz , Manuel Pastor and Javier Saiz Tx, a new biomarker for in-silico early assessment of drug-induced proarrhythmic risk SPEAKER: Jordi Cano
11:00	Gonzalo Rios-Muñoz , Antonio Artés-Rodríguez , Anqel Arenal and Carlos Sánchez Left Atrium Patient-Specific Modelling from Electroanatomical Maps SPEAKER: Gonzalo Rios-Muñoz
11:15	Ana Minchole , Ernesto Zacur , Vicente Grau and Blanca Rodriguez Clinical MRI-based multiscale computational models of heart and torso to investigate the role of anatomy on ECG SPEAKER: Ana Minchole
11:30	Jesus Fernandez-Bes , David Adolfo Sampedro-Puente and Esther Pueyo A Bayesian Filtering methodology to identify key drivers of ventricular repolarization variability SPEAKER: Jesus Fernandez-Bes
11:45	Ana Maria Sanchez de La Nava , Ismael Hernández-Romero , Maria De La Salud Guillem , Felipe Atienza , Francisco Fernández-Avilés , Alejandro Liberos and Andreu M. Climent Automatic Atrial Fibrillation Initiation for the Evaluation of Proarrhythmic Risk at Tissue In-Silico Models SPEAKER: Ana Maria Sanchez de La Nava
12:00	Hector Martinez-Navarro , Ana Minchole , Alfonso Bueno-Orovio and Blanca Rodriguez Arrhythmogenic mechanisms in silent acute myocardial ischemia SPEAKER: Hector Martinez-Navarro
12:15	Carlos Alberto Ledezma , Xin Zhou , Blanca Rodriguez , Pi Tan and Vanessa Diaz-Zuccarini Neural networks to classify ischemic ECG signals: a computational study SPEAKER: Carlos Alberto Ledezma

10:30-12:30 Session 3B: Surgical Decision Support

CHAIRS: [Ilse Jonkers](#) and [Ana Piqueras](#)

LOCATION: [Room 0.01](#)

10:30	Jos Vander Sloten Surgical Decision Support in Knee Surgery SPEAKER: Jos Vander Sloten
11:00	Tilai Rosalina , Arthur Bouwman and Peter Bovendeerd Mathematical model of fluid status after intravenous fluid infusion SPEAKER: Tilai Rosalina
11:15	Maria Paz Quilez , Peter Vanden Bergh , Roel Wirix-Speetjens and Maria Angeles Perez Automation and validation of a musculoskeletal model setup for predicting TKA functional outcome SPEAKER: Maria Paz Quilez
11:30	Martijn Hoeijmakers , Michel Rochette , Marek Kasztelnik , Jürgen Weese , Rod Hose and Frans van de Vosse Towards Real-Time Transaortic Pressure Gradient Computation SPEAKER: Martijn Hoeijmakers
11:45	Dulce Oliveira , Marco Parente and Renato Natal Computerized Clinical Decision Support System for Childbirth Management: Preliminary Considerations SPEAKER: Dulce Oliveira
12:00	Sanjay Pant , C Corsini , C Baker , G Pennati , T-Y Hsia and I.E Vignon Clementel Surgical planning in relation to atrioventricular valve regurgitation in single-ventricle physiology: the dilemma of valve repair SPEAKER: Sanjay Pant

10:30-12:30 Session 3C: Clinical Applications and Personalized Medicine: Models in Oncology

CHAIRS: [Morgan Germain](#) and [Georgios Stamatakos](#)

LOCATION: [Room 0.02](#)

10:30	Georgios Stamatakos and Norbert Graf In Silico Oncology: Building and validating hypermodels and Oncosimulators as clinical decision support systems in the framework of the EU-US CHIC project SPEAKER: Georgios Stamatakos
11:00	Ilaria Stura and Caterina Guiot Assessing Radiotherapy Effectiveness in Prostate Cancer: model validation on the EUREKA2 cohorts SPEAKER: Ilaria Stura
11:15	Katerina Argyri , Elisabetta Munzone , Laura Adamoli and Georgios Stamatakos In Silico Oncology: A vascular tumour growth based Oncosimulator for reproducing the clinical time-course of breast cancer patients undergoing bevacizumab mono-therapy SPEAKER: Georgios Stamatakos
11:30	Norbert Graf and Georgios Stamatakos Bridging the gap between basic science and clinical oncology by IT infrastructures for models to support clinical decision support SPEAKER: Norbert Graf
11:45	Oleksii Rukhlenko , Fahimeh Khorsand , Cheree Fitzgibbon , Estefania Chiquero-Leon , Zhi Liu , Nora Rauch , Elisa Panada , Shannon Lee , Jan Rozanc , Leo Alexopoulos , Silvia Gómez-Coca , Edina Rosta , Boris Kholodenko , Walter Kolch and Jens Rauch Tackling acquired resistance mechanisms in malignant melanoma. SPEAKER: Jens Rauch

12:00	Shunzhou Wan , Agastya Bhati and Peter Coveney In Silico Evaluation of Inhibitory Potential with Rapid and Reliable Binding Affinity Predictions SPEAKER: Peter Coveney
12:15	Thierry Fredrich , Sabrina Stella , Heiko Rieger , Roberto Chignola and Edoardo Milotti Progress in cell-based, quasi-lattice-free simulations of vascularized solid tumours SPEAKER: Edoardo Milotti

10:30-12:30 Session 3D: Multiscale modeling I

CHAIRS: [Alfons Hoekstra](#) and [Ilya Ponomarev](#)

LOCATION: [Room 0.03](#)

10:30	Marco Viceconti , Pinaki Bhattacharya and Xinshan Li Multiscale VPH models: better predictive accuracy or increased explanatory power? Reflection on the hip fractures problem SPEAKER: Marco Viceconti
11:00	David Nickerson , Tommy Yu , Soroush Safaei and Peter Hunter Physiome: encouraging reproducibly FAIR computational modelling SPEAKER: Peter Hunter
11:15	Azam Khan and Rhys Goldstein The Role of Multiscale Time in Multiscale Systems Biology SPEAKER: Azam Khan
11:30	Pinaki Bhattacharya , Zainab Altaj , Sachin Prabhu H. R. , Muhammad Qasim and Marco Viceconti Efficacy of hip fracture risk reduction using multifactorial interventions combining environmental hazard management and balance training SPEAKER: Pinaki Bhattacharya
11:45	Oliver Roehrl , Julian Valentin , Michael Sprenger , Okan Avci and Dirk Pflüger Forward simulations of three-dimensional, continuum-mechanical musculoskeletal system models SPEAKER: Oliver Roehrl
12:00	Hamna Afaq , Andrii Grytsan , Dana Damian and Paul Watton In-Silico Modelling of Oesophageal Tissue for Treatment of Long Gap Oesophageal Atresia SPEAKER: Hamna Afaq
12:15	Gabriele Nasello , María Ángeles Pérez , Roel Wirix-Speetjens and José Manuel García-Aznar Multiphysic Approach for Bicomponent Tissue Engineered Bone Grafts SPEAKER: Gabriele Nasello

10:30-12:30 Session 3E: Inverse problems for model personalization I

CHAIRS: [Dominique Chapelle](#) and [Philippe Moireau](#)

LOCATION: [Room 0.04](#)

10:30	Dimitar Stanev and Konstantinos Moustakas The Effect of Kinematic and Dynamic Redundancy on the Assessment of Joint Reaction Loads SPEAKER: Dimitar Stanev
10:45	Lucas O. Müller , Alfonso Caiazzo and Pablo J Blanco Personalization of one-dimensional blood flow models via a reduced-order unscented Kalman filter in the frequency domain SPEAKER: Alfonso Caiazzo

11:00	<i>Cristóbal Bertoglio, Hugo Carrillo, David Nolte, Jeremías Garay, Axel Osses and Sergio Uribe</i> Overcoming aliasing in velocity-encoded MRI for blood flow computations SPEAKER: <i>Cristóbal Bertoglio</i>
11:15	<i>Federica Caforio and Sébastien Imperiale</i> Modelling of impulsive source in a prestressed soft tissue SPEAKER: <i>Federica Caforio</i>
11:30	<i>Christoph Augustin, Karli Kae Gillette, Laura Marx, Aurel Neic, Matthias Gsell and Gernot Plank</i> Clinical Personalization of Models of Left Ventricular Electromechanics SPEAKER: <i>Christoph Augustin</i>
11:45	<i>Annabelle Collin, Thibaut Kritter, Thierry Colin, Clair Poignard and Olivier Saut</i> Modeling and inverse problems in tumor growth SPEAKER: <i>Olivier Saut</i>
12:00	<i>Stefania Paolelli, Belén Fos, Irene Mayorqa, Luis Martí-Bonmatí, Ángel Alberich-Bayarri and José Remohí</i> Combined Machine Learning and Textural Image Analysis of endometrial Ultrasound images for prediction of egg implantation rate and ongoing pregnancy in infertile patients SPEAKER: <i>Belén Fos</i>
12:15	<i>Hao Gao, Kenneth Manjion, Colin Berry and Xiaoyu Luo</i> Mathematical modelling acute myocardial infarction using in vivo magnetic resonance imaging SPEAKER: <i>Hao Gao</i>

10:30-12:30 Session 3F: Hands-on-cardiovascular image analysis workshop - **MATERIALISE**

LOCATION: [Room 1.03](#)

12:30-14:00 Lunch Break

13:00-14:00 Session 4: VPH General Assembly

LOCATION: [Plenary Room, Marco Carrera](#)

14:00-15:30 Session 5A: Cardiovascular modeling: from simulation to clinical outcome organised by E-cardiology II

CHAIRS: *Maciej Marciniak* and *Francesco Migliavacca*

LOCATION: [Plenary Room, Marco Carrera](#)

14:00	<i>Benedetta Biffi, Hamad Alkareef, Aqata Grasso, Silvia Schievano and Claudio Capelli</i> Image-derived, population specific analysis of the mitral valve apparatus: towards a realistic setting for device in-silico testing SPEAKER: <i>Claudio Capelli</i>
14:15	<i>Pavlo Yevtushenko, Jan Bruening, Florian Hellmeier, Leonid Goubergrits and Titus Kuehne</i> Uncertainty in Non-Invasive, Numerical Assessment of Pressure Drop across a Coarctation of the Aorta SPEAKER: <i>Pavlo Yevtushenko</i>
14:30	<i>Joao Filipe Fernandes, Alessandro Faraci, Saul Myerson, David A. Nordsletten and Pablo Lamata</i> Inaccuracies of clinical pressure gradient measurements: Quantification of pressure recovery in aortic valve conditions SPEAKER: <i>Joao Filipe Fernandes</i>
14:45	<i>Florian Hellmeier, Sarah Nordmeyer, Jan Bruening, Simon Suendermann, Leonid Goubergrits and Titus Kuehne</i> Predictive Modeling of Isolated Aortic Valve Replacement SPEAKER: <i>Florian Hellmeier</i>

15:00	<p>Frida Svelander, David Larsson, Tino Weinkauff, Reidar Winter, Matilda Larsson and Johan Hoffman</p> <p>A Clinical Pathway for Patient-Specific Simulation of Left Ventricle Hemodynamics Based on Echocardiography</p> <p>SPEAKER: Johan Hoffman</p>
15:15	<p>Farhad Rikhtegar Nezami, Elazer R. Edelman and Steven P. Keller</p> <p>Effect of Central versus Peripheral ECMO Support on Blood Flow Distribution: A Computational Study</p> <p>SPEAKER: Farhad Rikhtegar Nezami</p>

14:00-15:30 Session 5B: Orthopaedics and craneofacial I

CHAIRS: [Jonathan Pitocchi](#) and [Nico Verdonschot](#)

LOCATION: [Room 0.01](#)

14:00	<p>Fernando Perez Boerema, Pawel Tomaszewski, Semih Perdahcioğlu, Dennis Janssen, Liesbet Geris and Nico Verdonschot</p> <p>Surrogate-based optimization of acetabular implant design through minimization of stress shielding</p> <p>SPEAKER: Fernando Perez Boerema</p>
14:15	<p>Riza Bayoqlu, Pavel E. Galibarov, Nico Verdonschot, Bart Koopman and Jasper Homminga</p> <p>Twente Spine Model: A Study of the Intervertebral Disc Forces in Flexion</p> <p>SPEAKER: Pavel E. Galibarov</p>
14:30	<p>Erica Montefiori, Luca Modenese, Marco Viceconti and Claudia Mazzà</p> <p>Patient-specific musculoskeletal models to characterise the response to disease activity in patients with Juvenile Idiopathic Arthritis</p> <p>SPEAKER: Erica Montefiori</p>
14:45	<p>Dennis Pedersen and Michael Skipper Andersen</p> <p>Estimation of Subject-specific Knee Ligament Properties</p> <p>SPEAKER: Dennis Pedersen</p>
15:00	<p>Jason Halloran, Thor Besier, Carl Imhauser, Peter Laz, Tina Morrison, Kevin Shelburne and Ahmet Erdemir</p> <p>A Collaborative Strategy to Establish Reproducibility in Simulation-Based Prediction of Natural Knee Mechanics</p> <p>SPEAKER: Jason Halloran</p>
15:15	<p>Joshua Kaufmann, Alison McGreggor and Andrew Phillips</p> <p>Investigating bone health in trans-femoral amputees</p> <p>SPEAKER: Joshua Kaufmann</p>

14:00-15:30 Session 5C: Agent-based models

CHAIRS: [Alberto Badias](#) and [Maria Jose Gomez-Benito](#)

LOCATION: [Room 0.02](#)

14:00	<p>Ravi Radhakrishnan, Alokendra Ghosh and Kandy Kutty Sreeja</p> <p>Multiscale Biophysical Modeling of Receptor Activation, Signaling and Trafficking in Cancer</p> <p>SPEAKER: Ravi Radhakrishnan</p>
14:15	<p>Josué Manik Nava Sedeño and Andreas Deutsch</p> <p>Lattice-gas cellular automaton models for collective cell migration</p> <p>SPEAKER: Josué Manik Nava Sedeño</p>
14:30	<p>Etelvina Javierre, Francisco J Gaspar and Carmen Rodriqz</p> <p>Insights of avascular tumour growth by means of a biphasic porous elastic model</p> <p>SPEAKER: Etelvina Javierre</p>

14:45	Samuel Jesus Ramos Infante and María Angeles Pérez Ansón In vitro and in silico characterization of computational prediction of cement infiltration in osteoporotic bones: an in vitro and in silico biomechanical study SPEAKER: Samuel Jesus Ramos Infante
15:00	Stephane Couvreur , Agnieszka Nowacka , Benedetta Biffi , Elena Milano , Jan Bruse , Gaetano Burriesci , Andrew Taylor , Claudio Capelli and Silvia Schievano Statistical Shape Analysis of the Right Ventricular Outflow Tract in Patients with Tetralogy of Fallot SPEAKER: Stephane Couvreur
15:15	Laura Baumgartner , Miquel Ángel González Ballester and Jérôme Noailly 3D Agent Based Modelling of Intervertebral Disc Nucleus Pulposus cells to simulate the effects of disc tissue property alterations SPEAKER: Laura Baumgartner

14:00-15:30 Session 5D: Multiscale modeling II

CHAIRS: [Alfonso Santiago](#) and [Marco Viceconti](#)

LOCATION: [Room 0.03](#)

14:00	Mohammad Mehrjan , Ioannis Papantoniou , Toon Lambrechts and Liesbet Geris Computational modelling of the effect of growth factors on human mesenchymal stem cell proliferation in 3D porous scaffolds SPEAKER: Mohammad Mehrjan
14:15	William Pruett , John Clemmer and Robert Hester Insights into mechanisms of resistance to renal denervation using topological analysis of simulation SPEAKER: William Pruett
14:30	Nima Afshar , Vinod Suresh , Soroush Safaei , Peter Hunter and David Nickerson Computational Modelling of the Role of GLUT2 in Glucose Uptake by Intestinal Epithelial Cells SPEAKER: Nima Afshar
14:45	Alan Garny , David Brooks and Peter Hunter OpenCOR: a modelling environment for reproducible science SPEAKER: Alan Garny
15:00	Ana Guerra , Jorge Belinha and Renato Natal Jorge Computational Model of Wound Healing Angiogenesis: a Preliminary Study SPEAKER: Ana Guerra

14:00-15:30 Session 5E: Inverse problems for model personalization II

CHAIRS: [Dominique Chapelle](#) and [Tilai Rosalina](#)

LOCATION: [Room 0.04](#)

14:00	Philippe Moireau and Dominique Chapelle Effective estimation for biomedical models SPEAKER: Philippe Moireau
14:30	Damiano Lombardi , Jean-Frédéric Gerbeau and Eliott Tixier Numerical design of composite biomarkers SPEAKER: Damiano Lombardi
14:45	Antoine Gérard , Yves Coudière and Annabelle Collin Validation of a sequential data assimilation method applied to cardiac electrophysiology SPEAKER: Antoine Gérard
15:00	Andrea Manzoni , Stefano Pagani and Alfio Quarteroni Reduced Order Modeling for Uncertainty Quantification of the cardiac function SPEAKER: Andrea Manzoni

15:30-16:00 Session 6A: Flash Presentation I

CHAIRS: [Alan Garny](#) and [Giulia Luraqhi](#)

LOCATION: [Plenary Room, Marco Carrera](#)

15:30	Charles Taylor and Jacob King Patient Profiles and Clinical Event Simulations in a Left Heart Simulator SPEAKER: Charles Taylor	PB 1
15:34	Benyuan Xu , Alan Ruddock and Maria-Cruz Villa-Uriol Steps, energy expenditure and heart rate agreement of five activity trackers SPEAKER: Maria-Cruz Villa-Uriol	PB 2
15:38	Shaktidhar Dandapani , Namrata Gundiah , Xiaoyu Luo and Paul Watton Soft Tissue Growth and Remodelling Framework: Application in Myocardial Infarction SPEAKER: Shaktidhar Dandapani	PB 3
15:42	Sergei Shulepov , Marco Baraogona and Ralph Maessen Evaluation of SPH method for cardiac flow simulations SPEAKER: Marco Baraogona	PB 4
15:46	Arthur Le Gall , Radomir Chabiniok , Fabrice Vallée and Dominique Chapelle In vivo evaluation of noradrenaline effects using a heart model SPEAKER: Radomir Chabiniok	PB 5
15:50	Kay Brosien , Leonid Goubergrits and Markus Kelm Non-invasive cardiac stress tests: a 0D modelling approach SPEAKER: Kay Brosien	PB 6
15:54	Valentina Carapella , Ernesto Zacur , Bernardo Lino de Oliveira and Joakim Sundnes Modular open-source workflow for in silico studies of atrial electrophysiology SPEAKER: Valentina Carapella	PB 7

15:30-16:00 Session 6B: Flash Presentation II

CHAIRS: [Mirko Bonfanti](#) and [Claudio Chiastra](#)

LOCATION: [Room 0.01](#)

15:30	Katharina Vellquth , Jan Brüning , Franziska Degener , Titus Kuehne and Leonid Goubergrits Simulation approach for the prediction of hemodynamic after virtual mitral valve repair interventions SPEAKER: Katharina Vellquth	PB 8
15:34	Krzysztof Czechowicz , Gareth Archer , Pat Lawford and D. Rod Hose Patient specific 0D model of the systemic circulation to simulate the effects of valve stenosis and regurgitation SPEAKER: Krzysztof Czechowicz	PB 9
15:38	Myriam Cilla , Marina Casales , Mauro Malvè and Miquel Àngel Martínez Barca Fluid parametric model of the blood flow in the ascending aorta SPEAKER: Myriam Cilla	PB 10
15:42	Ilya Ponomarev , Ksenia Zlobina and Georgy Guria Numerical study of thrombus formation processes in branched vascular networks SPEAKER: Ilya Ponomarev	PB 11
15:46	Silvia Rocchiccioli , Moritz Shuette , Nikolaos Tachos , Eleni Georqa , Silverio Sbrana , Jonica Campolo , Chiara Caselli , Antonios Sakellarios , Federico Vozzi , Jeff Smit , Arthur Scholte , Danilo Neglia , Dimitrios Fotiadis , Oberdan Parodi and Gualtiero Pelosi The impact of genomics in the development of a diagnostic model for stable coronary artery disease. SPEAKER: Federico Vozzi	PB 12

15:50	Patricia Hernandez , Myriam Cilla , Andrés Mena , Miquel A Martínez and Estefania Peña On modelling patient-specific carotid atherosclerotic plaque formation SPEAKER: Patricia Hernandez	PB 13
15:54	Benigno Marco Fanni , Emanuele Gasparotti , Francesco Faita , Nicole Di Lascio , Silvia Schievano , Luiqi Landini , Simona Celi , Vincenzo Positano and Claudio Capelli An integrated image-based framework for the mechanical characterization of patient-specific blood vessels SPEAKER: Claudio Capelli	PB 14

15:30-16:00 Session 6C: Flash Presentation III

CHAIRS: [Mariano Vázquez](#) and [Rubén Zorrilla](#)

LOCATION: [Room 0.02](#)

15:30	Alejandro Liberos , Andreu M. Climent , Ana M. Sanchez de La Nava , Miquel Rodrigo , Ismael Hernandez-Romero , Francisco Fernandez-Aviles , Felipe Atienza and Maria S. Guillem Atrial Flutter Re-entrant Circuit Identification based on Body Surface Phase Mapping SPEAKER: Ana Maria Sanchez de La Nava	PB 15
15:34	Elena Ibarz , Raquel Lacuesta , Sergio Puértolas , Antonio Herrera , Jorge Albareda , Jorge Delgado and Luis Gracia Development of a Finite Element Model to assess tumour tissue evolution SPEAKER: Elena Ibarz	PB 16
15:38	Juliana Franz , Raoul R.F. Stevens , Wouter Huberts and Frans N. van de Vosse Outlet resistance estimation for 1D pulse wave propagation modelling in the cerebral arteries SPEAKER: Juliana Franz	PB 17
15:42	Fred Vermolen and Qiyao Peng Agent-based modelling of contraction of burns SPEAKER: Qiyao Peng	PB 18
15:46	Milton Hoz de Vila and Alejandro Federico Franqi The Back-UP Project: Towards predictive diagnosis and personalised medicine for NLBP underpinned by the VPH technologies and vision SPEAKER: Milton Hoz de Vila	PB 19
15:50	Jan Meizner , Marian Bubak , Tomasz Gubała , Marek Kasztelnik , Maciej Malawski and Piotr Nowakowski Security Tools for Modern Computational Medicine SPEAKER: Jan Meizner	PB 20
15:54	Rajanikanth Vadiqepalli A Rubric for Evaluating the Credible Practice of Computational Modeling and Simulation in Healthcare SPEAKER: Rajanikanth Vadiqepalli	PB 21

15:30-16:00 Session 6D: Flash Presentation IV

CHAIRS: [Ruben Doste](#) and [Frederic Turquier](#)

LOCATION: [Room 0.03](#)

15:30	Elisabete Silva , Marco Parente , Teresa Mascarenhas and Renato Natal Jorge Application of a genetic algorithm to check the variation of the biomechanical properties of asymptomatic and incontinent women SPEAKER: Elisabete Silva	PB 22
15:34	Tomas Janak , Yoann Lafon , Philippe Petit and Philippe Beillas	PB

	Morphing detailed human body models to represent weight change SPEAKER: Yoann Lafon	23
15:38	Julius Zimmermann and Ursula van Rienen Electromagnetic stimulation chambers for chondrocytes SPEAKER: Julius Zimmermann	PB 24
15:42	Jolanthe Verwaerde , Jérémy Laforêt , Catherine Marque and Alain Rassineux Coupling of finite element and electro-chemical models of the uterine muscle SPEAKER: Jolanthe Verwaerde	PB 25
15:46	Elena Lanchares , Maria Angeles Del Buey , José Anqel Cristóbal and Begoña Calvo Numerical simulation of intraocular lens implantation in the lens capsule during the cataract surgery procedure SPEAKER: Elena Lanchares	PB 26
15:50	Jeremy Laforet , Ines Douania , Vincent Carriou and Sofiane Boudaoud Global sensitivity analysis of HD-sEMG amplitude descriptors from a cylindrical multilayered muscle model SPEAKER: Jeremy Laforet	PB 27
15:54	A. Amar and O. Barnea Three-dimensional (3D) Multiscale Model of the Contracting Ventricle SPEAKER: A. Amar	PB 28

15:30-16:00 Session 6E: Flash Presentation V

CHAIRS: [Marlene Mengoni](#) and [Maria Paz Quilez](#)

LOCATION: [Room 0.04](#)

15:30	Jeff Bischoff and Philippe Favre Virtual Assessment of the Primary Stability of Hip Prostheses SPEAKER: Jeff Bischoff	PB 29
15:34	Andrea Ferrari , Luiqi La Barbera , Alessandro Cianfoni , Daniela Di Stefano , Giuseppe Bonaldi and Tomaso Maria Tobia Villa Augmentation and Screw Assisted Internal Fixation (SAIF) in osteoporotic vertebrae: a finite element analysis of a new technique SPEAKER: Tomaso Maria Tobia Villa	PB 30
15:38	Bingbing Liang , Varun Manhas and Liesbet Geris Model-based design of 3D-printed calcium-phosphate based biomaterials for dental applications SPEAKER: Bingbing Liang	PB 31
15:42	Curtis Palasiuk , Andrew Chantry and Dawn Walker An Agent-Based Model of the Bone Remodelling Process and its Disruption by Multiple Myeloma SPEAKER: Curtis Palasiuk	PB 32
15:46	Luca Giovannelli , Juan José Ródenas , Enrique Nadal and Manuel Tur Patient-specific frequency analysis for the preoperative evaluation of implant stability SPEAKER: Juan José Ródenas	PB 33
15:50	Luis Gerardo Padrón Cabrera and Javier Bayod López Biomechanical Behaviour Of The Joint Sub/Astragalin, Skills with Supported Bodies, with a View to Designing a Prosthetic Replacement Prototype for Talus. SPEAKER: Luis Gerardo Padrón Cabrera	PB 34
15:54	Maria Hilvert , Peter Vanden Bergh , G. Harry van Lenthe , Roel Wirix-Speetjens and María José Gómez-Benito Optimizing material and design specifications of bioresorbable CMF plates using an in-silico model of a 4-point bending test	PB 35

SPEAKER: [Maria Hilvert](#)

16:00-16:30 Coffee Break

16:30-18:00 Session 7A: In silico Medicine in FP9

LOCATION: [Plenary Room, Marco Carrera](#)

16:30 – 16:50: Lies Geris – VPHi Executive Director: “The VPH Institute: promoting in silico medicine research” and “the VPHi Horizon Europe - Position Paper”

16:50 – 17:10: Violeta Isabel Pérez Nuevo (DG CONNECT): “Future priorities of in-silico medicine”

17:10 – 17:30: Tina Morrison (FDA): FDA research priorities for in silico medicine

17:30 – 18:00: Q&A

16:30-18:00 Session 7B: ERC & MSCA session

LOCATION: [Room 0.01](#)

ATTRACTIVE OPPORTUNITIES FOR YOUNG RESEARCHERS IN EUROPEAN PROJECTS (H2020)

This talk will show an overview of different opportunities for young researchers in the frame of European Projects (H2020).

In order to cover all the aspects involved in a proposal preparation, both the formal issues of the calls as well as success cases will be presented.

Fundamental elements regarding preparation of the proposal will be reviewed, with particular emphasis on the definition of the problem that wants to be solved, its significance and the selection of an innovative methodology to tackle it.

Based on previous experiences of H2020 applicants, tips will be provided on: the importance of identifying the best moment to present the proposal; the time you should reserve to not only write but more crucially to think about your idea; or the benefit of seeking for advice from colleagues with expertise in different disciplines, not necessarily close to yours.

Finally, the talk will go over the way you report your CV and your past achievements and how this can influence how others may or may not see you as the best possible researcher to carry out the project you are presenting.

18:00-20:30 Session 8: VPH networking event (only registration for VPH members)

LOCATION: [Plenary Room, Marco Carrera](#)

18:05 – 18:15: Lies Geris – VPHi Executive Director: “Introduction on the scope of the session”

18:15 – 18:25: Martina Contin – VPHi Manager “VPHi as a project partner: community engagement and outreach”

18:25– 19:00: Juan Riese – Spanish NCP: “Presentation of the VPH related calls in last work program of H2020”

19:00: – 19:30: Q&A session on H2020 calls

19:30 – 20:30: Networking session – Drinks and small buffet

21:00-22:30 Student's social night

THURSDAY, SEPTEMBER 6TH

09:00-10:00 Session 9: Plenary speaker II

CHAIR: [Thierry Marchal](#)

LOCATION: [Plenary Room, Marco Carrera](#)

09:00	Blanca Rodriguez Human In Silico Drug Trials with Multiscale Models of the Heart
-------	--

10:00-10:30 Coffee Break

10:30-12:30 Session 10A: Cardiovascular modeling: from simulation to clinical outcome organised by E-cardiology III

CHAIRS: [Kay Brosien](#) and [Jose F Rodriguez Matas](#)

LOCATION: [Plenary Room, Marco Carrera](#)

10:30	David Adolfo Sampedro-Puente , Laura García-Mendivil , Estel Ramos Marquès , Aida Olivan-Viguera , Jesús Fernandez-Bes , Laura Ordovás and Esther Pueyo Cardiac dynamics and arrhythmic risk in aged and failing hearts: insights from experimental and computational research SPEAKER: Esther Pueyo
11:00	Luca Gerardo Giorda and Nicole Cusimano Combining tissue heterogeneity and anisotropy in a fractional model of cardiac electrophysiology SPEAKER: Nicole Cusimano
11:15	Giulia Luraghi , Jose Felix Rodriguez Matas , Alberto Garcia , Claudio Chiastra , Georgios Liappas , Giulio Stefanini and Francesco Migliavacca A patient-specific fluid-structure interaction analysis of TAVI procedure SPEAKER: Giulia Luraghi
11:30	Eduardo Godoy , Ana Ferrer , Miquel Lozano , Ignacio García-Fernández , Rob MacLeod , Javier Saiz and Rafael Sebastian Effect of fibrosis on BSPM of patients with focal atrial tachycardia SPEAKER: Ignacio García-Fernández
11:45	Fredrik Eikeland Fossan , Lucas Omar Müller , Jacob Sturdy and Leif Rune Hellevik Validation of a reduced order model for prediction of FFR, using in vivo data, 3D INS and UQ & SA SPEAKER: Fredrik Eikeland Fossan
12:00	David Adolfo Sampedro-Puente , Jesus Fernandez-Bes , Bradley Porter , Stefan Van Duijvenboden , Peter Taggart and Esther Pueyo Mechanisms underlying interactions between low-frequency oscillations and beat-to-beat repolarization variability under sympathetic provocation SPEAKER: David Adolfo Sampedro-Puente
12:15	Seyedehsamaneh Lashkarinia , Banu Kose , Mohammad Rezaeimoqhaddam , Ece Salihoğlu and Kerem Pekkan Computational pre-surgical planning of cardiovascular patch reconstruction – pre-operative structural and hemodynamic performance in selected clinical cases SPEAKER: Kerem Pekkan

10:30-12:30 Session 10B: Orthopaedics and craneofacial II

CHAIRS: [Maria Hilvert](#) and [María Angeles Perez Ansón](#)

LOCATION: [Room 0.01](#)

10:30	Nico Verdonschot , Andre Sprengers , Velentina Mazzoli , Marco Marra , Kaj Gijsbertse , Hao Chen , Kenan Niu , Hamid Naghibi and Dennis Janssen Towards functional pre-planning in orthopaedic surgery SPEAKER: Nico Verdonschot
-------	---

11:00	<p>Sergio Gabarre, Jorge Albareda, Luis Gracia, Sergio Puértolas, Elena Ibarz and Antonio Herrera Stability of anterograde intramedullary nails in distal femoral fractures SPEAKER: Sergio Gabarre</p>
11:15	<p>Sasa Cukovic, Christian Heidt, Daniel Studer and William R. Taylor Apex Vertebra Transpositions in the 3D Optical Diagnosis of 372 Patients with Adolescent Idiopathic Scoliosis SPEAKER: Sasa Cukovic</p>
11:30	<p>Carla Winsor, Leticia Campello, Muhammed Qasim, Ju Zhang, Xinshan Li, Corinne Henak, Perry Pickhardt, Heidi-Lynn Ploeg and Marco Viceconti A phantom-less calibration technique for use in femur strength prediction SPEAKER: Carla Winsor</p>
11:45	<p>Hendrikje Raben, Peer W. Kämmerer and Ursula van Rienen Design of an electro-stimulating system for a defective minipig mandible SPEAKER: Hendrikje Raben</p>
12:00	<p>Jonathan Pitocchi, Peter Vanden Berghe, Maria Angeles Pérez and Roel Wirix-Speetjens Integration of Cortical Thickness data in a Statistical Shape Model of the Scapula SPEAKER: Jonathan Pitocchi</p>
12:15	<p>Dan Zaharie and Andrew Phillips Development of a physiologically relevant structural model of the pelvic construct to simulate fracture SPEAKER: Andrew Phillips</p>

10:30-12:30 Session 10C: Other applications in organ physiology

CHAIRS: [Estefanía Peña](#) and [Jolanthe Verwaerde](#)

LOCATION: [Room 0.02](#)

10:30	<p>Gabriel Beltrán Lostal, Ignasi Jorba, Daniel Navajas and José Manuel García Aznar FE modelling of alveolar mechanics based on the Weaire-Phelan unit cell SPEAKER: Gabriel Beltrán Lostal</p>
10:45	<p>Ronan Mt Fleming, Sylvain Arreckx, Miguel Ap Oliveira, Donato Dimonte and Ayse Ulusoy Modelling the cerebral diffusive spread of pathology in Parkinson's disease SPEAKER: Ronan Mt Fleming</p>
11:00	<p>Jan Bruening, Thomas Hildebrandt, Werner Heppt, Matthias Bindernagel, Natalja Amiridze, Hans Lamecker, Stefan Zachow and Leonid Goubergrits An Averaged Geometry of the Human Nasal Cavity SPEAKER: Jan Bruening</p>
11:15	<p>Bryn Lloyd, Silvia Farcito, Esra Neufeld, Antonino Mario Cassarà and Niels Kuster NEUROMAN: Implementing Neuro-Functionalized Computational Human Body Models SPEAKER: Bryn Lloyd</p>
11:30	<p>Alberto Montolío Marco, Alejandro Martín Gallego, Elena García Martín, José Cejoñino Banzo and Amaya Pérez Del Palomar Aldea How Ionic Imbalances Alter Axonal Conduction. A Computational Study. SPEAKER: Alberto Montolío Marco</p>
11:45	<p>Claudio Monteiro Sousa, Evqueni Jacob, Bastien Martin, Samuel Laheux, Diane Sampson, Elise Roy, Jacky Vonderscher, Pietro Scalfaro, Patrice André and Jean-Pierre Boisse An in silico HBV model predicts viral response to the oral non-steroidal carboxylic acid FXR agonist EYP001a SPEAKER: Evqueni Jacob</p>

12:00	Giulia Luraqhi , Francesco Migliavacca and Jose Felix Rodriguez Matas A preliminary in silico model of the thrombectomy procedure SPEAKER: Jose Felix Rodriguez Matas
12:15	Sergio Puértolas , Antonio Herrera , Judith Millastre , Elena Ibarz , José A. Puértolas , Sergio Gabarre and Luis Gracia Customized design of colonic stents based on a parametric model SPEAKER: Sergio Puértolas

10:30-12:30 Session 10D: Multiscale modeling III

CHAIRS: [Juliana Franz](#) and [Peter Hunter](#)

LOCATION: [Room 0.03](#)

10:30	Christian Bleiler , Pedro Ponte Castañeda and Oliver Röhrle A microstructurally-based material model for the description of skeletal muscle tissue SPEAKER: Christian Bleiler
10:45	Thomas Klotz , Leonardo Gizzi and Oliver Röhrle Simulating Electromyography (EMG) Signals by Using a Generalized Bidomain Approach SPEAKER: Thomas Klotz
11:00	Dewan Sarwar , Reza Kalbasi , Koray Atalaq and David Nickerson Semantics-based model discovery for renal transport SPEAKER: David Nickerson
11:15	Andreas Linninger , Grant Hartung , Ryan Morley , Chang Sub Park , Claudia Vesel and Ali Alaraj Whole Brain Simulations in Mouse Elucidate Mechanisms of Local Cerebral Blood Flow Control SPEAKER: Andreas Linninger
11:30	Yuqian Mei , Paul Evans , Namrata Gundiah and Paul Watton Intracranial Aneurysms: A Patient-Specific Fluid-Solid-Growth (FSG) Framework with Modelling of Endothelial Response SPEAKER: Yuqian Mei
11:45	Austin Baird , Jennifer Carter , Jon Keller , Matt McDaniel , Bennett Welch and Steven White BioGears: An In-Silico Whole-Body Framework to Simulate Kinetics and Dynamics of Pharmaceuticals and Associated Reversal Agents SPEAKER: Austin Baird
12:00	Gábor Závodszky , Britt van Rooij and Alfons Hoekstra Multiscale model of transport and uncoiling of ultralarge proteins in cellular blood flows SPEAKER: Alfons Hoekstra

10:30-12:30 Session 10E: Model Reduction, Big Data and Dynamic Data-Driven Systems I

CHAIRS: [Laura Baumgartner](#) and [Elias Cueto Prendes](#)

LOCATION: [Room 0.04](#)

10:30	David González , Iciar Alfaro , Elias Cueto and Francisco Chinesta Organs Hybrid Twin: towards a new paradigm in computational surgery SPEAKER: Francisco Chinesta
11:00	Francesco Cornetti , Enrique Nadal , Irene Lucas-Tomas and Juan Jose Rodenas On the evaluation of hip fracture risk using advanced machine learning techniques SPEAKER: Enrique Nadal
11:15	Alberto Badias , Iciar Alfaro , David Gonzalez , Francisco Chinesta and Elias Cueto Deformable Augmented Reality via Model Order Reduction Methods

	SPEAKER: Alberto Badias
11:30	Marian Bubak , Tomasz Gubala , Rodney Dr Hose , Marek Kasztelnik , Maciej Malawski , Jan Meizner , Piotr Nowakowski and Steven Wood A Model Execution Environment for Valvular Heart Condition Simulations SPEAKER: Piotr Nowakowski
11:45	Judy Day , Jorg Gerlach and Yoram Vodovotz Modelling and control of an adaptive biohybrid device for modulation of inflammation SPEAKER: Judy Day

10:30-12:30 Session 10F: Industry Session: ANSYS

LOCATION: [Board Room \(1st floor\)](#)

12:30-14:00 Lunch Break

12:30-14:00 Session 11: Student's career mentoring

14:00-16:00 Session 12A: Cardiovascular modeling: from simulation to clinical outcome organised by E-cardiology IV

CHAIRS: [Jordi Cano](#) and [Laura Martínez](#)

LOCATION: [Plenary Room, Marco Carrera](#)

14:00	Ted Vaughan and William Ronan InSilic: In Silico Trials for drug-eluting bioabsorbable vascular scaffold (BVS) development and evaluation SPEAKER: Ted Vaughan
14:15	Mirko Bonfanti , Gaia Franzetti , John P. Greenwood , Sapna Puppala , Shervanthi Homer-Vanniasinkam , Stavroula Balabani and Vanessa Diaz A platform for patient-specific vascular medicine: a case study of a chronic type-B aortic dissection SPEAKER: Mirko Bonfanti
14:30	Nenad Filipovic , Velibor Isailovic , Dalibor Nikolic , Igor Saveljic , Zarko Milosevic , Antonis Sakellarios and Themis Exarchos In silico stent deployment in the coronary artery with plaque progression SPEAKER: Nenad Filipovic
14:45	Eduardo Soudah , Rubén Zorrilla , Vicente Mataix , Riccardo Rossi , Pooyan Dadvand and Antonio Barros Embedded Computational Fluid Dynamics to study cardiovascular pathologies: Aortic Dissection. SPEAKER: Rubén Zorrilla
15:00	Maciej Marciniak , Pablo Lamata , Andrew King , Vincent Jaddoe and Liza Toemen An anatomical surrogate of wall compliance in the child heart SPEAKER: Maciej Marciniak
15:15	Ruben Doste , Federica Sacco , Paul Iazzo , Tinen Iles , Constantine Butakoff , Jazmin Aguado-Sierra and Oscar Camara A rule based method for assigning fiber information to heart complex structures SPEAKER: Ruben Doste
15:30	Belen Casas , Federica Viola , Gunnar Cedersund , Ann Bolger , Matts Karlsson , Carl-Johan Carlhäll and Tino Ebbers A 4D Flow MRI-based modelling approach to assess left ventricular function during rest and stress conditions SPEAKER: Belen Casas
15:45	Pedro Morais , João Vilaça , Sandro Queirós , Jan D'Hooqe and João Manuel R. S. Tavares Automatic segmentation of the atrial region using a competitive deformable model approach SPEAKER: João Manuel R. S. Tavares

14:00-16:00 Session 12B: Impact and Injury

CHAIRS: [Claudia Mazzà](#) and [Alberto Montolio Marco](#)

LOCATION: [Room 0.01](#)

14:00	Juan Du , Chris Hartley , Katherine Brooke-Wavell , Margaret Paggiosi , Simin Li and Vadim Silberschmidt Effect of high-impact exercise on trabecular bone adaptation in postmenopausal women SPEAKER: Juan Du
14:15	Lukas Schimunek , Ruben Zamora , Rami Namas , Qi Mi , Haley Lindberg , Jinling Yin , Derek Barclay , Timothy Billiar and Yoram Vodovotz Patient-Specific Principal Component Analysis Stratifies Multiple Organ Dysfunction Outcomes based on Type 17 Immune Responses in Blunt Trauma Patients in the First 24 Hours Following Injury SPEAKER: Lukas Schimunek
14:30	Ana I Lorente , Mario Maza , Óscar Juste , Ana Piqueras and Francisco J. López-Valdés Thoracic Deformation in Nearside Oblique Sled Impacts SPEAKER: Ana I Lorente
14:45	J. Sebastian Giudice , Taotao Wu , Ahmed Alshareef and Matthew B. Panzer Development and Evaluation of a Subject-Specific Brain Injury Model SPEAKER: J. Sebastian Giudice
15:00	Mayao Wang , Simin Li , Elizabeth Zimmermann , Christoph Riedel , Björn Busse and Vadim Silberschmidt Effect of Bone Micromorphology on Multiple Crack Propagation: Finite-element Analysis SPEAKER: Vadim Silberschmidt
15:15	Carlos Ruiz Wills , Simone Tassani , Miquel Àngel González Ballester , Luis Miquel Del Río , Ludovic Humbert and Jérôme Noailly DXA-based 3D patient-specific femur model simulations for hip fracture prediction SPEAKER: Carlos Ruiz Wills
15:30	Ana Piqueras , Óscar Juste-Lorente , Ana I Lorente and Mario Maza Influence of the head size in the injury metrics for oblique impacts SPEAKER: Ana Piqueras
15:45	Edgar Rios , Derek Nesbitt and Trevor Lujan Using digital image correlation to validate meniscus tear patterns predicted by continuum damage models SPEAKER: Trevor Lujan

14:00-16:00 Session 12C: Image-based in-vitro analysis

CHAIRS: [Ana Guerra](#) and [Federico Vozzi](#)

LOCATION: [Room 0.02](#)

14:00	Laoise Mcnamara and Stefaan Verbruggen Image-based in vitro analysis and computational modelling to characterise the mechanical environment of bone cells during osteoporosis SPEAKER: Laoise Mcnamara
14:30	Pavel Zun , Andrew Narracott , Paul Evans and Alfons Hoekstra A model for endothelial cell migration under flow conditions SPEAKER: Pavel Zun
14:45	Francisco Merino-Casallo , Yago Juste-Lanas , María José Gómez-Benito , Ruben Martinez-Cantin and José Manuel García-Aznar Calibrating a stochastic model of cell migration using image-based in vitro analysis and Bayesian optimization.

	SPEAKER: Francisco Merino-Casallo
15:00	Daniil Parshin , Alexander Khe , Anna Lipovka , Nikolay Maslov , Alexander Yunoshev , Andrey Dubovoy , Konstantin Ovsyannikov and Alexander Chupakhin Cerebral aneurysm tissue investigation: experiment and simulations SPEAKER: Daniil Parshin
15:15	Carlos Borau , Esther Tomás , Vanessa Olivares , Cristina Del Amo , Nieves Movilla , Mar Condor , Jesús Asín and José Manuel García-Aznar IMAGO: an online platform for microscopy image analysis in in-vitro experiments SPEAKER: Carlos Borau
15:30	Marlene Mengoni , Fernando Y. Zapata-Cornelio , V. Naqitha Wijayathunga , Oluwasegun Kayode , Sebastien Sikora , Ksenija Vasiljeva , Alison C Jones and Ruth K Wilcox On the context of use of directly validated spinal functional units FE models SPEAKER: Marlene Mengoni
15:45	Zaira Manigrasso , Emanuele Gasparotti , Benedetta Biffi , Emanuele Vignali , Silvia Schievano , Luiqi Landini , Vincenzo Positano , Claudio Capelli and Simona Celi A novel 3D printed bioinspired cardiac pneumatic pump: from design to numerical and experimental study SPEAKER: Emanuele Vignali

14:00-16:00 Session 12D: Multiphysics modeling I

CHAIRS: [Peter Coveney](#) and [Julius Zimmermann](#)

LOCATION: [Room 0.03](#)

14:00	Yann Guyot , Ioannis Papantoniou and Liesbet Geris In silico characterisation of the spatiotemporal evolution of stem cell niches during neotissue growth in 3D scaffolds during perfusion bioreactor culture SPEAKER: Liesbet Geris
14:30	Silvia Hervás , María José Gómez-Benito and Jose Manuel García-Aznar Finite element analysis of individual cell migration under conditions of mechanical confinement SPEAKER: Silvia Hervás
14:45	Francisco Serrano Alcalde , María José Gómez Benito and José Manuel García Aznar Influence of the mechanical properties of cell nucleus on overall deformation of the cell: a computational study SPEAKER: Francisco Serrano Alcalde
15:00	Benjmmain Czaja , Gabor Zavodszky and Alfons Hoekstra Cell resolved simulations of saccular aneurysms: effects of pulsatility and aspect ratio SPEAKER: Benjmmain Czaja
15:15	Catherine Marque , Maxime Yochum and Jérémy Laforêt A multiphysic simulation of mechanotransduction effect through stretch operated channels in the uterine muscle. SPEAKER: Catherine Marque
15:30	Britt van Rooij , Gabor Zavodszky , Victor Azizi and Alfons Hoekstra Modelling high shear-rate platelet aggregation on cellular level SPEAKER: Britt van Rooij
15:45	Esra Neufeld , Nik Chavannes , Antonino Cassara , Bryn Lloyd , Pedro Crespo-Valero , Manuel Guidon , Odei Maiz and Niels Kuster o2S2PARC – The Simulation Core of the NIH SPARC Initiative SPEAKER: Esra Neufeld

14:00-16:00 Session 12E: Model Reduction, Big Data and Dynamic Data-Driven Systems II

CHAIRS: [Elias Cueto Prendes](#) and [Jan Meizner](#)

LOCATION: [Room 0.04](#)

14:00	David Gonzalez , Francisco Chinesta and Elías Cueto Development of Computational Patient Avatars by Manifold Learning SPEAKER: Elías Cueto
14:15	Alejandro Martín Gallego , Elena García Martín , Alberto Montolio Marco , José Cejoñino Banzo and Amaya Pérez Del Palomar Aldea The use of neuronal networks to help in pathologies diagnosis SPEAKER: Alejandro Martín Gallego
14:30	Andrey Svitenkov and Alfons Hoekstra Full-blown 3D blood flow simulation in approach of effective compressibility as a model of vessel elasticity SPEAKER: Andrey Svitenkov
14:45	Nathan Lauzeral , Domenico Borzacchiello , Guido Caluori , Martin Pesl , Zdenek Starek and Veronika Novotna Reduced order modelling of electroporation in biological tissues for pulse delivery optimization SPEAKER: Nathan Lauzeral
15:00	Pejman Farhadi Ghalati , Satya Swarup Samal , Jayesh Sudhir Bhat , Shukti Ramkiran , Oxana Khamidova , Robert Deisz and Andreas Schuppert Instabilities in Time Series from Intensive Care Units: A Sepsis Case Study SPEAKER: Satya Swarup Samal

14:00-16:00 Session 12F: Industry Session: Insilico Trials

LOCATION: [Board Room \(1st floor\)](#)

Technology transfer and access: challenges and opportunities

In the last decades, universities and research centers have been applying modeling and simulation (M&S) to problems involving health and medicine, coining the new expression *in silico clinical trials*, but its use is still limited to a restricted pool of expert adopters.

Making M&S available to a broad spectrum of potential users (medical device and pharmaceutical companies, hospitals, healthcare institutions) would require an easy and controlled access to models and computational resources in a secure and compliant environment while protecting the intellectual property of the models' creators.

Meanwhile, the European and USA regulatory agencies are starting to recognize the use of M&S in the research and technological development and to provide evidence in the approval process for new medical products. A joint effort from academia, industry and regulatory bodies is then required to reach a rapid adoption of a harmonized approach.

In this session, we will talk about potentials, limitations, challenges, and opportunities that the community has to deal with to leverage the significant value of M&S solutions which are being developed but are not fully exploited, in order to reach a broad adoption and democratization of simulations in healthcare.

Session topics

- Is there a "Valley of Death" for in silico medicine technologies? - Marco Viceconti, Executive Director at Insigneo Institute for in silico Medicine
- In silico modelling: From lab to the end-users - Javier Saiz, Professor at Universidad Politécnica de Valencia
- Learning from other industries: exploiting world class research to accelerate industrial innovations - Thierry Marchal, ANSYS Global Industry director
- One model for all and all efforts as one! - Nico Verdonshot, Scientific Director of Technical Medical Institute at University of Twente

- Technology transfer and technology access. How InSilicoTrials is working with researchers and industry – Luca Emili, CEO at InSilicoTrials Technologies

16:00-16:30 Coffee Break

16:30-19:00 Session 13: In silico clinical trials – a disruptive innovation for biomedical industry

CHAIRS: [Thierry Marchal](#) and [Marco Viceconti](#)

LOCATION: [Plenary Room](#), [Marco Carrera](#)

Target: Industry specialists (product developers, regulatory affair, clinical trialists, etc.)

16:30 – 16:45 **The emerging regulatory landscape for in silico methods** – Tina Morrison, FDA

16:45 – 17:30 **Tools and services for in silico clinical trials**: Moderator: Thierry Marchal, *Avicenna Alliance*.

Ansys – Representative.

Materialise – Sjoerd Kolk.

InSilicoTrials – Luca Emili.

Quibim – Angel Alberich-Bayarri.

17:30 – 17:45 **In silico Clinical Trials: A vision of the future**: Marco Viceconti, Insigneo Institute

17:45 – 18:00 **Examples of early applications**: Mark Palmer, *Medtronic*

18:00 – 18:10 **Scalability of Computational Medicine applications**: Peter Coveney, *CompBioMed CoE*

18:10 – 18:45 **Round table**. Moderator: Thierry Marchal, *Avicenna Alliance*

20:30-22:30 Social Dinner

FRIDAY, SEPTEMBER 7TH

09:00-10:00 Session 14: Plenary speaker III

CHAIR: [José Manuel García-Aznar](#)

LOCATION: [Plenary Room, Marco Carrera](#)

09:00	Ravi Iyengar Cell Shape Information: Retrieval and Physiological Consequences
-------	---

10:00-10:30 Coffee Break

10:30-12:30 Session 15A: Signalling networks

CHAIRS: [Dirk Fey](#) and [Katharina Vellquth](#)

LOCATION: [Plenary Room, Marco Carrera](#)

10:30	Dirk Fey Mathematical modelling of cancer signalling dynamics, drug responses and prognosis SPEAKER: Dirk Fey
11:00	Ruben Zamora , Derek Barclay , Jinling Yin , Estella Alonso , Mike Leonis , Qi Mi , Timothy Billiar , Richard Simmons , Robert Squires and Yoram Vodovotz Differential HMGB1 Network Connectivity may underlie the Protective Effect of N-acetylcysteine in the Context of Acetaminophen Toxicity in Pediatric Acute Liver Failure SPEAKER: Ruben Zamora
11:15	Morqan Germain , Johanna Bolander and Liesbet Geris Understanding the interactions between Wnt and BMP signalling pathways in human Periosteum Derived Cells SPEAKER: Morqan Germain
11:30	Raphaelle Lesage , Johan Kerkhofs and Liesbet Geris Reverse Engineering Methods to Study Osteochondral Regulatory Networks – a tool to identify potential drug targets SPEAKER: Liesbet Geris
11:45	Janet L Paluh , Arunima Banerjee , Amitava Mukherjee , K. Gaurav Kumar , Archisman Ghosh and Mrinal K. Naskar Modeling Multistep Molecular Communication Events in the Axonal Neuron Microtubule Network in Amyloid Beta Neurodegeneration SPEAKER: Janet L Paluh

10:30-12:30 Session 15B: Image-based in-vivo analysis

CHAIRS: [Laoise McNamara](#) and [Gabriele Nasello](#)

LOCATION: [Room 0.01](#)

10:30	James Sharpe Tissues, Information and Computers: Image-driven modelling of limb development SPEAKER: James Sharpe
11:00	Monika Colombo , Marco Bologna , Jose Felix Rodriguez Matas , Francesco Migliavacca , Marc Garbey , Scott Berceci and Claudio Chiastra Validation of a reconstruction method of femoral artery models from computed tomography and application to in vivo cases SPEAKER: Claudio Chiastra

11:15	Pavel Zun , Andrew Narracott , Claudio Chiastra , Julian Gunn and Alfons Hoekstra Validation of a 3D in-stent restenosis model using μCT and histology data SPEAKER: Pavel Zun
11:30	Alexander Danilov and Alexandra Yurova Image Segmentation and Mesh Generation for Biomedical Applications SPEAKER: Alexander Danilov
11:45	Charles Taylor , Jacob King , Clint Bergeron and Yasmeen Qudsi Parametric Anatomical Models for Cardiovascular Device Evaluation SPEAKER: Charles Taylor
12:00	Sanne Vancleef , Hans Vanhove , Joost Duflo , Ilse Jonkers and Jos Vander Sloten Experimental validation of finite element analysis of a composite clavicle using digital image correlation SPEAKER: Sanne Vancleef
12:15	Babita Verma , Pushpavanam Subramaniam and Rajanikanth Vadiqepalli An in silico model of human liver regeneration to predict critical factors controlling the recovery phenotype SPEAKER: Rajanikanth Vadiqepalli

10:30-12:30 Session 15C: Multiphysics modeling II

CHAIRS: [Juan Du](#) and [Ted Vaughan](#)

LOCATION: [Room 0.03](#)

10:30	Javier Escuer Gracia , Estefanía Peña Baquedano , Miguel Ángel Martínez Barca and Sean McGinty Elucidating the importance of drug dissolution and specific-binding in a 2D model of arterial drug-eluting stents SPEAKER: Javier Escuer Gracia
10:45	María Teresa Sanchez and José Manuel García-Aznar Multiphysics approach of confined cell migration SPEAKER: María Teresa Sanchez
11:00	Giulia Pederzani , Pervinder Bhoqal , Anne Robertson and Paul Watton A Mathematical Model of Cerebral Vasospasm and Comparison between Treatment Strategies SPEAKER: Giulia Pederzani
11:15	Bruno Frackowiak , Ralph Maessen , Marco Baraogona , Sergei Shulepov , Juliana Franz and Frans van de Vosse Structured fractal tree model for flow simulation in coronary vascular tree SPEAKER: Bruno Frackowiak
11:30	Karl D'Souza , Jiang Yao , Alban van Landeghem and Francisco Sahli Predicting cardiac toxicity of drugs using the Living Heart Model SPEAKER: Alban van Landeghem
11:45	Alfonso Santiago , Jazmín Aquado-Sierra , Ruth Arís , Eva Casoni and Mariano Vázquez A fluid-electro-mechanical model of the human heart for supercomputers SPEAKER: Alfonso Santiago

12:00	<p>Michele Marino, Meike Gierig and Peter Wriggers Multiphysics modelling of damage-induced response in arterial tissues: a chemo-mechano-biological computational framework for in-stent restenosis SPEAKER: Meike Gierig</p>
12:15	<p>Denis Pushin, Tetiana Salikhova, Ksenia Zlobina and Georgy Guria In Silico Investigation of Thrombosis Initiation in Left Ventricular Assist Device SPEAKER: Georgy Guria</p>

10:30-12:30 Session 15D: Mechanical cues in health and disease mechanisms organized by European Society of Biomechanics (ESB)

CHAIRS: [Erica Montefiori](#) and [Jerome Noailly](#)

LOCATION: [Room 0.02](#)

10:30	<p>Diego Alastruey-López, Fabio García-Castro, Ángel Alberich-Bayarri and M^a Ángeles Pérez Biomechanical Analysis of the Pedicle Screws and Cement Injection Influence in the Sacral Region Stiffness - A Finite Element Analysis SPEAKER: Diego Alastruey-López</p>
10:45	<p>Susanna Migliori, Claudio Chiastra, Marco Bologna, Eros Montin, Silvia De Francesco, Gabriele Dubini, Francesco Burzotta, Rajiv Rampat, James Cockburn, David Hildick-Smith, Luca Mainardi and Francesco Migliavacca A computational investigation of the link between wall shear stress after stent deployment in coronary arteries and neo-intimal coverage. SPEAKER: Susanna Migliori</p>
11:00	<p>Carlos Ruiz Wills, Miquel Àngel González Ballester, Jaro Karppinen and Jérôme Noailly Simulating cartilage endplate early degradation to understand intervertebral disc degeneration SPEAKER: Carlos Ruiz Wills</p>
11:15	<p>Simone Russo, Martín Prieto Fraaga, Manuel Arruebo, María-Angeles Pérez and José Manuel García-Aznar Combined in-vitro/in-silico model of biodegradation SPEAKER: Simone Russo</p>
11:30	<p>Miquel O. Bernabeu Estimation of Diabetic Retinal Microneurysm Perfusion Parameters Based on Computational Fluid Dynamics Analysis SPEAKER: Miquel O. Bernabeu</p>
11:45	<p>Tristan Belzacq, Baptiste Pierrat, Vit Novacek, Stephane Avril and Frederic Turquier Impact of the TAR technique for ventral hernia repairs on the abdominal wall biomechanics: a numerical study. SPEAKER: Frederic Turquier</p>
12:00	<p>John Clemmer, Robert Hester and W. Andrew Clemmer Investigating mechanisms of response to AV fistula for the treatment of hypertension using a mathematical model of physiology SPEAKER: John Clemmer</p>

10:30-12:30 Session 15E: Industry Session

CHAIRS: [Angel Alberich-Bayarri](#) and [Belén Fos](#)

LOCATION: [Room 0.04](#)

10:30	Gaurav Dwivedi , Qian Chen , Colleen Chelini and Samuel Burns Modeling Approach to Determine Optimal Prediabetic Diet SPEAKER: Samuel Burns
10:50	Tina Morrison , Kenneth Aycock , Jason Weaver and Brent Craven A Mock Submission to Initiate a Clinical Trial in the U.S. SPEAKER: Tina Morrison
11:10	Peter Gennemark Applying body-composition models in drug discovery SPEAKER: Peter Gennemark
11:30	Philippe Favre and Jeffrey Bischoff New Opportunities for Computational Biomechanics In the Industry SPEAKER: Jeffrey Bischoff

12:30-14:00 Lunch Break

12:30-14:00 Session 16: Board of directors meeting

LOCATION: [Board Room \(1st floor\)](#)

14:00-14:30 Session 17: VPH Closing Session

LOCATION: [Plenary Room, Marco Carrera](#)