

Day 1 | Wednesday, 21st October

08h50 - 09h00 Hands-on Session Registration

09h00 - 12h30 **Hands on session** on normal and congenital malformed hearts: double outlet right ventricle

Lucile Houyel and Monique Jongbloed

- Developmental aspects of DORV and functional single ventricle disease (MJ)
- Classification and nomenclature of DORVs, including DORV in the setting of single ventricle disease (LH)
- Video demonstration of specimens (MJ/LH)
- Hands-on session (MJ/LH)

A special addition to this session will allow 3D exploration of the specimens with Virtual Reality. (Presented by **Ségolène Bernheim** and **Cloé Huet**)

To better decipher mechanisms of cardiac development, correlation between morphological variants of congenital heart disease found in humans and those in mouse mutants is essential. This hands-on session, with a selection of human specimens, will be dedicated to double outlet right ventricle, a type of ventriculo-arterial connection particularly frequent in genetically modified mice. Specimen with DORV in the setting of functional single ventricle disease are included in the session. This event is an extraordinary complement of the ESC Textbook of Cardiovascular Development (Eds Jose M Perez-Pomares, Robert Kelly)

12h30 - 14h00 *Lunch in the canteen (Exclusive to Hands-on Sessions Participants)*

13h50 - 14h15 **General registration**

14h15 - 14h30 **Opening ceremony**

Platform session I | Congenital heart defects: Spotlight on single ventricle defects

14h30 - 14h40 Additional Ventures

14h40 - 14h55 Chick embryonic model of single ventricular physiology

David Sedmera, First Faculty of Medicine, Charles University, Czechia

14h55 - 15h10 A dual role for ETS1 in cardiac endothelium in heart development and disease

Paul Grossfeld, University of California San Diego School of Medicine, USA

15h10 - 15h25 Human HLHS-causing gene *Myrf* is expressed in multiple cardiac cell types and is sufficient to induce HLHS in mice

Mingfu Wu, University of Houston College of Pharmacy, USA

Platform session II | Cardiac structure, congenital heart defects and their mechanisms

15h30 - 15h45 *Wnt* and *Nodal* asymmetries stratify laterality phenotypes in the absence of node flow in mice

Signolene Meilhac, Imagine - Institut Pasteur, Unit of Heart Morphogenesis, France

15h45 - 16h00 Mechanisms of NTN1-dependent Tissue Organization in Heart Development and Congenital Heart Defects

Irfan Kathiriya, Department of Anesthesia & Perioperative Care, University of California, USA

16h00 - 16h15 Maternal Iron Deficiency Increases Congenital Heart Defect Incidence in Both Wild-Type and Notch1 Single-Point Variant Mouse Models

Hana Kolesova, First Faculty of Medicine, Charles University, Czechia

16h15 - 16h30 Intracardiac Fluid Viscosity as a Mediator of Cardiac Malformation

Michael Bressan, University of North Carolina at Chapel Hill, USA

16h35 - 17h05 *Coffee Break*

17h05 - 17h50 Keynote lecture I

Miguel Torres, CNIC, Madrid, Spain

17h50 - 20h00 Poster Session I (*odd numbers will present*) and Welcome Reception

Day 2 | Thursday, 22nd October

Platform session III | Cardiac engineering and organoids

09h00 - 09h15 Mechanisms of local translation at the sarcomere and the role of LARPs in cardiac development and function

Nicole Dubois, Icahn School of Medicine at Mount Sinai, USA

09h15 - 09h30 Reconstructing the human cardiac-immune niche in vitro

Selin Tüzüner, Institute of Developmental and Regenerative Medicine, University of Oxford, UK

09h30 - 09h45 Incorporation of hiPSC-derived macrophages into epicardioids models yolk sac macrophage biology of the developing human heart

Felipe Monge-Mora, Technical University of Munich, Germany

09h45 - 10h00 Decoding the pleiotropic role of Zic3 in Congenital Heart Disease using gastruloids

Caroline Choquet, Marseille Medical Genetics, MMG - INSERM – Aix-Marseille University, France

10h00 - 10h15 A cardioid-based framework for functional characterization of cardiac enhancers in human heart development

Ekapaski Wisnumurti, Department for Biomedical Research (DBMR), University of Bern, Switzerland

10h15 - 10h25 Sponsor session, currently: Oxford Instruments (Imaging)

10h35 - 11h05 *Coffee Break*

11h05 - 11h50 Keynote lecture II

Rashmi Prya, Francis Crick Institute, UK

11h50 - 12h20 Business meeting

12h20 - 13h50 *Lunch*

Platform session IV | Cardiac progenitors, lineages, and early heart development

13h50 – 14h15 *Mesp1* and *Hes1* interplay controls early cardiac progenitor cell specification

Sinem Inal, Aix-Marseille Univ, INSERM, MMG, U1251, France

14h15 – 14h30 SHF Progenitors Regulate Cardiac Outflow Tract Septation by Orchestrating Neural Crest Cell Migration via the Extracellular Matrix

Yuke Ji, Nanjing University Medical School, China

14h30 – 14h45 Disruption of Desmosomal Adhesion Drives Epicardial Dysfunction and Aberrant Hematopoiesis in the Embryonic Heart

Hoda Moazzen, RWTH Aachen University, Germany

14h45 – 15h00 A tale of two hearts: lineages and boundaries in the human cardiac interventricular septum

Claudio Cortes, Institute of Developmental and Regenerative Medicine, University of Oxford, UK

Platform session V | Epigenetics and differentiation

15h05 – 15h20 Using deeply conserved developmental enhancers to identify a *TBX20* enhancer with a critical role in human cardiac development and disease

Ian Scott, Department of Molecular Genetics, University of Toronto, Canada

15h20 – 15h35 Predicting pathogenic splicing with an "interpretable-by-design" neural network

Susan E Liao, Functional Genomics Section, IBENS - Institut de Biologie de l'École Normale Supérieure, France

15h35 – 15h50 Loss of *Gm14014* lncRNA disrupts epicardial paracrine signalling leading to progressive ventricular wall defects and electrophysiological shortening

Rocio Cruz-Avila, Cardiovascular Development Group; Department of Experimental Biology; University of Jaen, Spain

15h50 – 16h05 Dose-dependent sensitivity of human 3D chromatin to a heart disease-linked transcription factor

Benoit Bruneau, Gladstone Institutes, USA

16h10 - 16h40 Coffee Break

Platform session VI | Arrhythmias and the conduction system

16h40 – 16h55 Investigating the specification and maturation of the cardiac pacemaker

Tanishta Bhattacharya, Max Planck Institute for Heart and Lung Research, Bad Nauheim, Germany

16h55 – 17h10 Identification of an NKX2-5-dosage dependent progenitor cell population contributing to the cardiac Purkinje fiber network

Michel Louise, Aix-Marseille Université, CNRS UMR 7288, IBDM, France

17h10 – 17h25 Loss of ZFP516 results in perinatal lethality through congenital heart defects, sinus bradycardia and autonomic dysfunction

Lieke van Roon, Leiden University Medical Centre, The Netherlands

17h25 – 17h40 Identification and AAV-CRISPRi/a-based modulation of variant regulatory elements to unravel the regulome underlying Brugada syndrome

Freek Tiel Groenestege, Amsterdam University Medical Centre, The Netherlands

17h40 – 17h55 *Transcriptomic evaluation of Hand1 during cardiogenesis*

Anthony Firulli, Indiana University School of Medicine Wells Center for Pediatric research, USA

17h55 - 20h00 Poster session II (*even numbers will present*) & snacks and drinks

Day 3 | Friday, 23rd October

Platform session VII | Platform session VII Valves and Vessels

09h00 – 09h15 A new mechanism for arterial valve leaflet remodeling

Deborah Henderson, Bioscience Institute, Newcastle University, UK

09h15 – 09h30 Loss of *Nherf2* leads to progressive aortic dilation and diminishes systolic blood pressure

Brenda Giselle Flores Garza, Centro Nacional de Investigaciones Cardiovasculares Carlos III (CNIC), Spain

09h30 – 09h45 Cellular programs controlling cardiovascular calcification in zebrafish

Anabela Bensimon-Brito, University of Toulouse, CNRS, Centre de Biologie Intégrative (CBI), France

09h45 – 10h00 Investigating the Novel Role of VEGFR3 in Pharyngeal Arch Artery Development

Jonathan Dias, Rutgers Biomedical and Health Sciences, USA

10h00 – 10h15 Lost in translation: How Pax9 loss disrupts cardiovascular development

Rachel Sanders, Biosciences Institute, Faculty of Medical Sciences, Newcastle University, UK

10h20 – 10h50 *Coffee Break*

Platform session VIII | Myocardial structure and function

10h50 – 11h05 Trabecular fate is genetically hardwired during vertebrate heart development

Kelly Smith, The University of Melbourne, Australia

11h05 – 11h20 Dissecting Oligogenic Inheritance in Sarcomere-Negative Hypertrophic Cardiomyopathy Through WGS and Functional In Vivo Modeling

Marina Piñol-Cancer, Centro Nacional de Investigaciones Cardiovasculares Carlos III (CNIC), Spain

11h20 – 11h35 Human epicardioids reveal disruption of an epicardial–endothelial signaling niche in left ventricular hypertrabeculation pathogenesis

Sophie Zengerle, Technical University of Munich, Germany

11h35 – 11h50 Deciphering endocrine control of cardiomyocyte gene programs

Jack Alexander Palmer, Cambridge Stem Cell Institute, University of Cambridge, United Kingdom

12h00 - 12h45 Keynote lecture III

Thomas Braun, Max Planck Institute for Heart and Lung Research, Germany

12h45 – 13h00 Group Photo

13h00 – 14h30 *Lunch*

Platform session IX | Cardiac repair and regeneration

14h30 - 14h45 Sensing Differently, Building Differently: ECM Dynamics and Cardiac Fibroblast Fate in the regenerative heart of the Spiny Mouse

Maria Cardona-Timoner, i3S, University of Porto, Portugal

14h45 - 15h00 Cardiac regeneration versus fibrosis: using zebrafish to understand the dual role of inflammation-adaptive immunity in the injured heart

Joao Carneira-da-Silva, RESTORE Institute, France

15h00 - 15h15 Comparison of cardiac regeneration capacity between zebrafish and medaka reveals a regenerative response in both teleost species

Miguel Angel Garitagoitia-Romero, CNIC – Centro Nacional de Investigaciones Cardiovasculares, Spain

15h15 - 15h30 Uncoupling protein 3 overexpression triggers cardiomyocyte metabolic reprogramming and improves heart repair after myocardial infarction

Yoann Kovacs, INSERM U1251 MMG – Aix-Marseille Université, Marseille, France

15h30 - 15h45 Combining mechanical and pharmacological support to redirect post-MI wound healing towards regeneration

Esmeralda Meijboom, Leiden Medical University Centre, The Netherlands

15h45 – 16:00 Inside publishing for Cardiovascular Development & Regeneration

16h00 - 16h20 Awards and closing of the meeting

16h20 - 16h45 *Coffee Break*

16h45 *Meet in front of the Institute for the Visit to the Port Wine Cellars*

19h30 *Farewell networking dinner at Sancho Panza Restaurant*