



# CVRC

CardioVascular Research Cluster

BERN

## Annual Meeting 2024

24 January 2024

Online presentations + On-site posters & Apéro,  
Atrium A Ground Floor, Sitem-Insel

- New Aspects in Cardiovascular Imaging
- Acquired Cardiovascular Diseases, Metabolism and Prevention
- Roundtable: Artificial vessels and cardiac organoids - Will we still need animal experimentation in the future?
- Sex Differences, Development (Aging) and Genetic Bases of Cardiovascular Diseases
- Medical Technologies and Structural Heart Diseases
- Vascular Disorders
- Arrhythmias

## Meeting Programme

## Organization Committee

Dr. Maria Arnold, Scientific and Administrative Manager of the Cardiovascular Research Cluster Bern, Inselspital, Bern University Hospital and University of Bern

Dr. med. Sarah Bernhard, Division of Angiology, Swiss Cardiovascular Centre, Inselspital, Bern University Hospital

Daniela Castillo Robles, Administrative Assistant Cardiovascular Research Cluster Bern, Inselspital, Bern University Hospital and University of Bern

Prof. Dr. Yvonne Döring, Division of Angiology, Swiss Cardiovascular Centre, Inselspital, Bern University Hospital and Department for BioMedical Research, University of Bern

Prof. Dr. Sarah Longnus, Department of Cardiac Surgery, Inselspital, Bern University Hospital and Department for BioMedical Research, University of Bern

Prof. Dr. med. Katja Odening, Translational Cardiology, Department of Cardiology, Inselspital, Bern University Hospital and Department of Physiology, University of Bern

Ass. Prof. Dr. Marco Osterwalder, Department for BioMedical Research, University of Bern and Department of Cardiology, Inselspital, Bern University Hospital

PD Dr. med. Emrush Rexhaj, Department of Cardiology, Inselspital, Bern University Hospital

## Meeting Programme Overview

10:00-10:05	Opening / Welcome (online, Zoom)
10:05-10:45	Session 1: New Aspects in Cardiovascular Imaging
10:45-10:55	Break
10:55-11:35	Session 2: Acquired Cardiovascular Diseases, Metabolism and Prevention
11:35-11:45	Break
11:45-12:25	Session 3: Roundtable “Artificial Vessels and Cardiac Organoids - Will we still need animal experimentation in the future?”
12:25-12:55	Lunch Break (Prof. Mercader's interview with Prof. Dimmeler)
12:55-13:40	Session 4: Sex Differences, Development (Aging) and Genetic Bases of Cardiovascular Diseases
13:40-13:50	Break
13:50-14:30	Session 5: Medical Technologies and Structural Heart Diseases
14:30-14:40	Break
14:40-15:25	Session 6: Vascular Disorders
15:25-15:35	Break
15:35-16:15	Session 7: Arrhythmias
16:15-16:45	Break + Poster hanging
16:45-19:00	Poster presentations (Sitem Atrium A ground floor), Prize announcements and get-together Apéro

# Detailed Scientific Programme

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10:00-10:05    Opening / Welcome (online, Zoom)

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## Session 1: New Aspects in Cardiovascular Imaging

Chairs:

Nicolas Brugger, Department of Cardiology

Kady Fischer, Department of Anaesthesiology and Pain Medicine

10:05            Emerging imaging technologies for noninvasive cardiac tissue characterization  
Jessica Bastiaansen, Department of Diagnostic, Interventional and Pediatric Radiology & Translational Imaging Center, sitem-insel

10:25-10:45    Flash presentations from abstracts

- Quantifying the return of diastolic function after elective electrical cardioversion in atrial fibrillation patients with 4D-Flow-MRI  
Davide Colatruglio, Department of Anaesthesiology and Pain Medicine
- Digital model of coronary arteries based on computed tomography and optical coherence tomography using image processing  
Marc Ilic, Department of Cardiology
- Biventricular systolic function fluctuates during breathing maneuvers simulating the induction of general anaesthesia  
Stephanie Keser, Department of Anaesthesiology and Pain Medicine

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10:45-10:55    Break

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## Session 2: Acquired Cardiovascular Diseases, Metabolism and Prevention

Chairs:

Lukas Hunziker, Department of Cardiology

Sarah Longnus, Department of Cardiac Surgery and Department for BioMedical Research

10:55            **Arterial Hypertension**  
Emrush Rexhaj, Department of Cardiology

11:15-11:35    **Flash presentations from abstracts**

- ChemR23 expression protects against smooth muscle cell phenotype switching in atherosclerosis  
Bryce Evans, Division of Angiology and Department for BioMedical Research
- Circulating factors, measured both in the donor and during ex-vivo heart perfusion, correlate with subsequent heart recovery in a pig model of DCD  
Selianne Graf, Department of Cardiac Surgery and Department for BioMedical Research
- AKAP2 is a novel regulator of collagen secretion in cardiac myofibroblasts  
Greta Scherler, Department of Biomedical Sciences, University of Lausanne

11:35-11:45    **Break**

## Session 3: Roundtable “Artificial Vessels and Cardiac Organoids - Will we still need animal experimentation in the future?”

Chair:

Yvonne Döring, Division of Angiology and Department for BioMedical Research

Dominik Obrist, ARTORG Center for Biomedical Engineering Research

11:45-12:25 **Artificial Vessels and Cardiac Organoids - Will we still need animal experimentation in the future?**

Panelists:

- Olivier Guenat, ARTORG Center for Biomedical Engineering Research
- Drosos Kotelis, Department of Vascular Surgery
- Nadia Mercader, Institute of Anatomy
- Marco Osterwalder, Department for BioMedical Research and Department of Cardiology
- Robert Rieben, Department for BioMedical Research

**Lunch Break**

12:25-12:55 During the lunch break: Prof. Nadia Mercader's interview with Prof. Dr. Stefanie Dimmeler (Frankfurt, Germany), who was awarded the title Doctor Medicinae Honoris Causa by the University of Bern, will be shown.

## Session 4: Sex Differences, Development (Aging) and Genetic Bases of Cardiovascular Diseases

Chairs:

Jean-Sébastien Rougier, Institute for Biochemistry and Molecular Medicine

Hildegard Tanner, Department of Cardiology

12:55 **Recent advancements in cardiac organoid technologies and their application in our NRP79 „HeartX“ project**  
**Christian Zuppinger, Department of Cardiology and Department for BioMedical Research**

13:15-13:40 **Flash presentations from abstracts**

- Sex differences in cardiac recovery in a rat model of DCD  
Alexia Clavier, Department of Cardiac Surgery and Department for BioMedical Research
- Sex differences in atrial electrophysiology:  $I_{K1}$  is a major factor that is modulated by sex hormones  
Lucilla Giammarino, Translational Cardiology, Department of Physiology and Department of Cardiology
- Epigenomic profiling identifies a non-coding region that calibrates *Tbx5* gene dosage in the developing heart and limb  
Vincent Rapp, Department for BioMedical Research
- A novel platform to discover key ligand-receptor interactions regulating zebrafish heart regeneration  
João Carvalho, Institute of Anatomy

13:40-13:50 Break

## Session 5: Medical Technologies and Structural Heart Diseases

Chairs:

Jonas Lanz, Department of Cardiology

David Reineke, Department of Cardiac Surgery

13:50 Combining patient data, modeling and emerging technology to enhance clinical outcome  
Silje Ekroll Jahren, ARTORG Center for Biomedical Engineering Research

14:10-14:30 Flash presentations from abstracts

- Hemodynamic assessment of anomalous aortic origin of a right coronary artery with the use of fractional flow reserve and intra-vascular ultrasound  
Anselm Stark, Department of Cardiology
- Heartbeat detection in photoplethysmography signals for the monitoring of cardiac arrhythmias  
Jeanningros Loïc, Swiss Center for Electronics and Microtechnology, Neuchâtel and EPFL

- Microfluidic model of microvascular obstruction to investigate thrombolysis under flow  
Anastasia Milusev, ARTORG Center for Biomedical Engineering Research

14:30-14:40 Break

## Session 6: Vascular Disorders

Chairs:

Britta Engelhardt, Theodor Kocher Institute

Stefan Freigang, Department of Tissue Medicine and Pathology

14:40 New diagnostic and therapeutic options for congenital vascular malformations  
Sarah Bernhard, Department of Angiology

15:00-15:25 Flash presentations from abstracts

- A human iPSC-derived isogenic model of the neurovascular unit to explore blood-brain barrier dysfunction in neuroinflammation  
Pelin Kasap, Theodor Kocher Institute
- Quantifying flow characteristics in cortical microvascular networks during ischaemic stroke with varying penetrating tree and leptomeningeal collateral densities  
Chryso Lambride, ARTORG Center for Biomedical Engineering Research
- Loss of B cell-ACKR3 reduces atherosclerosis by decreasing plasma cells and pro-inflammatory antibody production  
Anaïs Yerly, Division of Angiology and Department for BioMedical Research
- Successful replantation of porcine forelimbs 33 hours after amputation utilizing 24-hour ex vivo perfusion for vessel protection  
Lei Zhang, Department for BioMedical Research



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15:25-15:35 Break

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## Session 7: Arrhythmias

Chairs:

Katja Odening, Translational Cardiology, Department of Cardiology and Department of Physiology

Laurent Roten, Department of Cardiology

15:35 Atrial Fibrillation: Rhyme or Reason  
Ange Maguy, Department of Physiology

15:55-16:15 Flash presentations from abstracts

- New pacing paradigms to assess the stability of cardiac conduction  
Stephan De Waard, Department of Physiology
- Posterior wall ablation by pulsed-field ablation - procedural safety, efficacy and findings on redo procedures  
Küffer Thomas, Department of Cardiology
- KCNH2-suppression-replacement gene therapy attenuates the pathogenic phenotype in transgenic rabbits with short QT syndrome type 1  
Saranda Nimani, Translational Cardiology, Department of Physiology and Department of Cardiology

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16:15-16:45 Break + Poster hanging

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16:45-18:45 Poster presentations (Sitem Atrium A ground floor) and get-together Apéro

- 16:45-17:30: Poster Session 1, odd numbers
- 17:30-18:15: Poster Session 2, even numbers

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18:45-19:00 Prize announcements (Nina Ullrich, Department of Physiology)  
Closing

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## List of Posters

Odd numbers: Poster presenters will be present at their poster during Poster Session 1.

Even numbers: Poster presenters will be present at their poster during Poster Session 2.

Poster nb.	Name	Affiliation	Title
1	Abegg Julia	Department of Anesthesiology and Pain Medicine, Bern University Hospital	Breathing maneuvers have similar effects on myocardial oxygenation changes as the pharmacological vasodilator regadenoson
2	Alerni Nicolò	Department of Physiology, University of Bern and Department of Cardiology, Bern University Hospital	Exploring the crossroads of electrical and mechanical properties in transgenic rabbits with long-QT and short-QT syndrome
3	Arduini Marco	Department of Anesthesiology and Pain Medicine, Bern University Hospital	Perioperative left ventricular strain to predict the onset of perioperative myocardial injury
4	Barbieri Miriam	Department of Physiology, University of Bern and Department of Cardiology, Bern University Hospital	SGK1 inhibition normalizes action potential duration in transgenic LQT2 rabbits but not in LQT1, suggesting a novel gene-specific therapeutic approach in long QT syndrome
5	Beer Georgia	Department of Cardiac Surgery, University Hospital Bern and Department for BioMedical Research, University of Bern	PhD project plan: ex-vivo heart perfusion - technology that innovates cardiac transplantation and precision therapies
6	Bornemann Karoline-Marie	ARTORG Center for Biomedical Engineering Research, University of Bern	Quantification of platelet activation and sinus washout in larger aortic roots of transcatheter heart valve thrombosis patients
7	Clavier Alexia	Department of Cardiac Surgery, University Hospital Bern and Department for BioMedical Research, University of Bern	Sex differences in cardiac recovery in a rat model of DCD
8	Colatruglio Davide	Department of Anesthesiology and Pain Medicine, Bern University Hospital	Quantifying the return of diastolic function after elective electrical cardioversion in atrial fibrillation patients with 4D-Flow-MRI
9	Coppe Benedetta	Institute of Anatomy, University of Bern	A paternal cardiac lesion induces cardiac adaptation in the offspring
10	De Waard Stephan	Department of Physiology, University of Bern	New pacing paradigms to assess the stability of cardiac conduction

11	Evans Bryce	Division of Angiology, University Hospital of Bern and Department for BioMedical Research, University of Bern	ChemR23 expression protects against smooth muscle cell phenotype switching in atherosclerosis
12	Ferrari Lorenzo	ARTORG Center for Biomedical Engineering Research, University of Bern	ExtraCorporeal Membrane Oxygenator (ECMO) cannulae evaluation in pulsatile and non-pulsatile pediatric mock circuit
13	Fujisawa Miwako	Theodor Kocher Institute, University of Bern	New molecular underpinnings of BBB dysfunction in multiple sclerosis
14	Giammarino Lucilla	Department of Physiology, University of Bern and Department of Cardiology, Bern University Hospital	Sex differences in atrial electrophysiology: $I_{K1}$ is a major factor that is modulated by sex hormones
15	Graf Selianne	Department of Cardiac Surgery, University Hospital Bern and Department for BioMedical Research, University of Bern	Circulating factors, measured both in the donor and during ex-vivo heart perfusion, correlate with subsequent heart recovery in a pig model of DCD
16	Helmer Anja	Department of Cardiac Surgery, University Hospital Bern and Department for BioMedical Research, University of Bern	Sex-specific alterations in cardiac metabolic gene expression, as a result of ischemia-induced cardiac injury, represent sex-specific targets for reperfusion therapy in heart transplantation after circulatory death
17	Ilic Marc	Department of Cardiology, University Hospital Bern	Digital model of coronary arteries based on computed tomography and optical coherence tomography using image processing
18	Illli Joël	Department of Cardiology, University Hospital Bern	Development and design of a high cardiac output flow-loop for patient-specific right coronary anomaly testing
19	Illli Joël	Department of Cardiology, University Hospital Bern	Mechanical testing and comparison of porcine tissue, silicone- and 3D-printed materials for cardiovascular phantoms
20	Jeanningros Loïc	Swiss Center for Electronics and Microtechnology, Neuchâtel and Swiss Federal Institute of Technology Lausanne	Heartbeat detection in photoplethysmography signals for the monitoring of cardiac arrhythmias
21	Kasap Pelin / Borovko Irina	Theodor Kocher Institute, University of Bern	A human iPSC-derived isogenic model of the neurovascular unit to explore blood-brain barrier dysfunction in neuroinflammation

22	Keser Stephanie	Department of Anesthesiology and Pain Medicine, Bern University Hospital	Biventricular systolic function fluctuates during breathing maneuvers simulating the induction of general anaesthesia
23	Küffer Thomas	Department of Cardiology, University Hospital Bern	Posterior wall ablation by pulsed-field ablation - procedural safety, efficacy and findings on redo procedures
24	Lambride Chryso	Department of Neurology, University Hospital Zurich and ARTORG Center for Biomedical Engineering Research, University of Bern	Quantifying flow characteristics in cortical microvascular networks during ischaemic stroke with varying penetrating tree and leptomeningeal collateral densities
25	Louradour Julien	Department of Physiology, University of Bern and Department of Cardiology, Bern University Hospital	Simultaneous assessment of mechanical and electrical function in Langendorff-perfused ex-vivo mouse heart
26	Milusev Anastasia	ARTORG Center for Biomedical Engineering Research, University of Bern	Microfluidic model of microvascular obstruction to investigate thrombolysis under flow
27	Mokhtari Ali	ARTORG Center for Biomedical Engineering Research, University of Bern	Comparative analysis of 4D flow MRI and CFD simulations in an improved patient-based carotid bifurcation with 80% stenosis
28	Nimani Saranda	Department of Physiology, University of Bern and Department of Cardiology, Bern University Hospital	KCNH2-suppression-replacement gene therapy attenuates the pathogenic phenotype in transgenic rabbits with short QT syndrome type 1
29	Ottersberg Rahel	Department of Cardiac Surgery, University Hospital Bern and Department for BioMedical Research, University of Bern	Optimized ex-vivo heart perfusion protocol to achieve a 24-hour out-of-body time in a porcine model of donation after circulatory death
30	Rapp Vincent	Department for BioMedical Research, University of Bern	Epigenomic profiling identifies a non-coding region that calibrates <i>Tbx5</i> gene dosage in the developing heart and limb
31	Roland Virginia	Department for BioMedical Research, University of Bern	Cardiac cell type enhancer architecture in the <i>Gata4-Hand2</i> regulatory axis shapes mammalian heart development
32	Rösch Yannick	ARTORG Center for Biomedical Engineering Research, University of Bern	Microfluidic model of microvascular obstruction with real porcine microthrombi to investigate effect of proximal intracoronary balloon occlusion on local drug concentration

33	Scherler Greta	Department of Biomedical Sciences, University of Lausanne	AKAP2 is a novel regulator of collagen secretion in cardiac myofibroblasts
34	Schulz Julia	Division of Angiology, University Hospital of Bern and Department for BioMedical Research, University of Bern	ChemR23 modifies PVAT function and crosstalk within the arterial vasculature in atherosclerosis
35	Schwerzmann Yann	Department of Anesthesiology and Pain Medicine, Bern University Hospital	Retrospective temporal resolution interpolation impacts myocardial strain quantification on compressed sensing cardiovascular magnetic resonance cine images
36	Stark Anselm	Department of Cardiology, University Hospital Bern	Hemodynamic assessment of anomalous aortic origin of a right coronary artery with the use of fractional flow reserve and intra-vascular ultrasound
37	Yadav Garima	Department for BioMedical Research, University of Bern	Exploring the role of the glycocalyx in xenotransplantation research
38	Yerly Anaïs	Division of Angiology, University Hospital of Bern and Department for BioMedical Research, University of Bern	Loss of B cell-ACKR3 reduces atherosclerosis by decreasing plasma cells and pro-inflammatory antibody production
39	Zhang Lei	Department for BioMedical Research, University of Bern	Successful replantation of porcine forelimbs 33 hours after amputation utilizing 24-hour ex vivo perfusion for vessel protection
40	Zimmermann Cedric	Department for BioMedical Research, University of Bern	In vitro characterization of the immunological effect of multigene modification in donor pigs for xenotransplantation
41	Zoia Matteo	Department for BioMedical Research, University of Bern	Multiome profiling identifies compartment- and cell type-specific cardiac enhancers during mammalian heart development
42	Zuppinger Christian	Department of Cardiology, University Hospital Bern and Department for BioMedical Research, University of Bern	Establishing a hiPSC-derived cardiac organoid model for the identification of non-coding regulatory genomic sequences involved in human heart chamber formation
43	Carvalho João	Institute of Anatomy, University of Bern	A novel platform to discover key ligand-receptor interactions regulating zebrafish heart regeneration
44	Horvath Andras	Department of Physiology, University of Bern and Department of Cardiology, Bern University Hospital	Investigation of cellular Na <sup>+</sup> Ca <sup>2+</sup> -handling and its sex differences in rabbit atrial cardiomyocytes

45	Calastra Camilla	Department of Diagnostic, Interventional and Paediatric Radiology (DIPR)	Characterising artero-venous malformations using MR-based data
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