

## **PhD Specialization Program *Cardiovascular Research***

Bern, 28.11.2022

### Coordinators:

- Prof. Sarah Longnus (Department of Cardiac Surgery, Inselspital, Bern University Hospital and Department for BioMedical Research, University of Bern)
- Prof. Katja Odening (Translational Cardiology, Department of Cardiology, Inselspital, Bern University Hospital and Department of Physiology, University of Bern)

### Planned start:

FS2023

### Registration:

Students must first be enrolled in the GCB and then must separately register to the PhD Specialization program. See Step-by-Step Registration Guide.

### Target group:

PhD and MD-PhD students enrolled in the GCB who perform research in the cardiovascular field

### Description:

The new Cardiovascular PhD Curriculum will be embedded into existing courses of the Graduate School for Cellular and Biomedical Sciences (GCB) and existing activities and network of the Cardiovascular Research Cluster (CVRC) Bern. Additional courses were developed to enrich the fundamental cardiovascular research education. Importantly, PhD students registered in the program will benefit from the three partner programs / universities. PhD students from Bern will be able to attend established lecture series / courses from partner universities and obtain ECTS credits for the doctoral program and vice versa (pending validation of the GCB and PhD Specialty Representative(s)).

### Partner programs/universities:

- Università della Svizzera italiana: Cardiovascular / Human Cardiovascular Sciences PhD Program
- University of Lausanne: Cardiovascular and metabolism PhD program of the Faculty of Biology and Medicine (FBM) and the University Hospital (CHUV)
- Ludwig-Maximilians-Universität & Technical University Munich, Munich, Germany: Integrated Research Training Group (IRTG) on Atherosclerosis PhD program

### Form and content:

Each doctoral student must obtain a minimum of 10 ECTS. The program is divided in two sections: a basic module (4 ECTS) with mandatory courses and an elective module (4 ECTS) that allows each student to choose courses and focussing on specific cardiovascular topics according to individual needs. The remaining 2 ECTS (optimally non-cardiovascular) should be earned through courses acceptable to the GCB and allow the students to choose courses with content targeting specific topics considered advantageous for specific PhD projects.

Basic Module (mandatory courses)	4 ECTS
Elective Module	4 ECTS
Additional (optimally non-cardiovascular)	2 ECTS
<b>Total</b>	<b>10 ECTS</b>

### Mandatory courses (4 ECTS):

Out of the mandatory 6 ECTS needed for obtaining a PhD from the GCB, the PhD students of the Cardiovascular specialization can acquire 4 ECTS from the basic cardiovascular courses described below. The CVRC Annual Meeting is mandatory for PhD students with the Cardiovascular specialization.

- Techniques in Cardiovascular Research (3 ECTS), KSL 487286 (for 2023, it was KSL 481120)
- Heart Module (3.75 ECTS), KSL 431732
- Cardiovascular Technology (3 ECTS), KSL 407234
- CVRC Annual Meeting (0.5 ECTS, attending & presenting), KSL 481115

### Elective modules (4 ECTS):

For the cardiovascular specialization, each student will choose courses from the elective modules to obtain another 4 ECTS.

- Courses from mandatory list (if not yet counted as mandatory course)
- Wahlpraktikum: Heart rate variability, Kucera (3 ECTS), KSL 453322
- Wahlpraktikum: Cellular and Translational Cardiac Electrophysiology, Odening & Maguy (3 ECTS), KSL 453322
- Vascular Cell Biology (2 ECTS), KSL 103079
- Book lectures (Book club): Cardiovascular (electro)physiology, Rougier (0.5-1 ECTS), KSL 481180-0 or 481180-1 (only 2023)
- CVD Program Monthly Meeting (0.5 ECTS, attending & presenting), KSL 481915
- Journal Club – Cardiac Surgery Lab (0.5 ECTS for attendance with active participation, must participate as Presenter and Discussant at least one time each), KSL 482647 / 487110
- Cardiovascular Student Retreat (0.5 ECTS, attending & presenting), KSL 487182-HS2023
- CVRC Mini Symposium: Sex and Gender Differences in Cardiovascular Medicine (0.25 ECTS, attending & presenting), KSL 487284-HS2023
- Courses from partner programs (USI, Lausanne, Munich) - see list in appendix
- International Cardiovascular Conferences: attending and presenting (individually approved by the PhD Speciality Representatives, 0.5 ECTS per Conference, max. 1 ECTS / 2 conferences can be credited to the Elective Modules)
- Other cardiovascular-related courses and/or lab exchanges (individually approved by the PhD Speciality Representatives, amount of ECTS individual)

### Special Diploma Supplement:

After completion of the PhD, the additional specialization of the Cardiovascular Research PhD program will be honored with a special diploma supplement detailing the additional coursework and effort to achievement of the Cardiovascular specialization.

We highly encourage PhD students of the University of Bern with a research interest in cardiovascular research to enroll in this program as they will definitely profit from this special education.

Yours sincerely,  
Prof. S. Longnus

Prof. K. Odening

## Appendix

*List of courses from partner universities*

*Please always check on the website of the corresponding partner programs for the latest dates and updates.*

### Università della Svizzera italiana: [Cardiovascular / Human Cardiovascular Sciences PhD Program:](#)

Course program ([website](#)):

Course, event	Description	Duration and credits	Responsible and contacts	Dates
Cardiocentro internal lectures	<ul style="list-style-type: none"> <li>Giulio Cossu, University of Manchester</li> <li>Michela Noseda, Imperial College London</li> <li>Mauro Giacca, King's College London</li> <li>Nadia Mercader, University of Bern</li> <li>Elena Osto, University of Zurich</li> </ul>	10 per year  1 ECTS	Cardiocentro lucio.barile@cardiocentro.org	17.05.2022 21.06.2022 19.07.2022 20.09.2022 18.10.2022
Extracellular vesicles and intercellular communication	Introduction in cell-to-cell communication mediated by extracellular vesicles. The course will cover the principles of their biogenesis, cell targeting, uptake, and cargo release required for functional paracrine activity.	3 hours (2x 90 min)  0.25 ECTS	Cardiocentro Carolina Balbi, Elena Vacchi  registration: carolina.balbi@eoc.ch	Dates TBD (as soon as the min. number of participants is reached)
Ion channels and Channelopathies	Ion channels background: structure-function relationship. The aim of the course is to focus on the physiological	3 hours (3x 60 min)	Cardiocentro Claudia Altomare  registration: claudia.altomare@eoc.ch	Dates TBD (as soon as the min. number of participants is reached)

	contribution of transmembrane ion channels with the particular attention to their role in the main pathological conditions.	0.25 ECTS		
PhD Day	A special opportunity for USI PhD students not only to get to know each other, discuss with their peers and attend various lectures, but also to present their work to through posters or public presentations.	1 day 0.5 ECTS	USI phd.biomed@usi.ch	Date TBD

**University of Lausanne: [Cardiovascular and metabolism \(CVM\) PhD program of the Faculty of Biology and Medicine:](#)**

Course program ([website](#)):

Course, event	Description	Duration and credits	Responsible and contacts	Dates
CVM Mini-Symposia	1-2 symposia per year. Two examples are listed in the next two rows.	Morning session 0.25 ECTS, whole day 1 ECTS		
Example 1: CVM Mini-Symposium	" <a href="#">Imaging techniques in cardiovascular and metabolism research: Hot topics and challenges</a> "	Morning session 0.25 ECTS, whole day 1 ECTS	Organizer: Jessica Bastiaansen, Department of Radiology & Translational Imaging Center, University and University Hospital of Berne, Switzerland	20 May 2022
Example 2: CVM Mini-Symposium	" <a href="#">Communication between peripheral tissues and the brain: key to keep a normal bodyweight and glycemia</a> "	Morning session 0.25 ECTS, whole day 1 ECTS	Organizer: Virginie Mansuy-Aubert, Department of Biomedical Sciences, University of Lausanne (DSB-UNIL)	09 December 2022
Example 3: CVM Mini-Symposium	" <a href="#">Extracellular Matrix Deficiencies and Cardiovascular Pathologies</a> "	Morning session 0.25 ECTS,	Organizer: Nathalie Rosenblatt-Velin, Angiology Service, University Hospital Lausanne	25 April 2024

		whole day 1 ECTS		
Symposium	<a href="#">"Cardiac RNA-mediated (re)programming"</a>	0.5 ECTS for talk sessions + 0.75 ECTS for workshop (total max. 1.25 ECTS)	Collaborative symposium of the SNF Sinergia Program "Regenerative strategies for heart disease via targeting the long noncoding transcriptome" and the CVM PhD program FBM-UNIL.	Thursday 9 March 2023 - 9h00 to Friday 10 March 2023 - 16h00
CVM Course	<a href="#">Biostatistics for non-statisticians - good practices, misuse and pitfalls</a> : The course aims to explain the importance of biostatistics for science reproducibility/ reliability and teach good practices. The lectures are tailored to biologists and concentrate on logic thinking: no heavy mathematics.	3 half-days 1 ECTS	Romain-Daniel Gosselin, Precision Medicine Unit, CHUV	<ul style="list-style-type: none"> <li>• Session 1 – February 20, 2023: 9h30 – 13h</li> <li>• Session 2 – February 21, 2023: 9h30 – 13h</li> <li>• Session 3 – February 27, 2023: 9h30 – 13h</li> </ul>
CVM Tutorials	Tutorial on a specific topic. One example in the next row.	5x 2h sessions 1 ECTS		5x 2h
Example 1: CVM Tutorial	<a href="#">Genetics of Inherited Cardiac Diseases</a> : The main objective of this course is to familiarize the doctoral candidates (MD, PhD, or MD-PhD) with cardiovascular system biology, diseases in cardiovascular system, genetic basis of the cardiac diseases e.g. hereditary cardiac arrhythmias, cardiomyopathies and congenital structural heart defects. The goal is to familiarize participants with the present state of scientific knowledge in this field of medicine, and the prospects of experimental research in this branch of science and medicine.	Annually: 5x 2h sessions 1 ECTS	Zahurul Alam Bhuiyan	27.10.2022, 03.11.2022, 10.11.2022, 17.11.2022, 24.11.2022

**Ludwig-Maximilians-Universität & Technical University Munich, Munich, Germany:  
[Integrated Research Training Group \(IRTG\) on Atherosclerosis PhD program:](#)**

Course program ([website](#)):

Course, event	Description	Duration and credits	Responsible and contacts	Dates
IRTG 1123 Lecture Series and Seminar Series	Weekly program is posted on the <a href="#">website</a> .	every week but alternating either Lecture or Seminar, 0.5 ECTS per semester for 80% attendance		
IRTG 1123 Advanced Methods Courses	Courses posted on the <a href="#">website</a> .	1-2 days courses, 0.5 ECTS per day		
IRTG 1123 Retreat	Annual Retreats. More info on the <a href="#">website</a>	0.5 ECTS per day, 1-2 days		