

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)

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 Cardiovascular PhD Curriculum is 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
Total	10 ECTS

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
- CVRC Mini Symposium: Sex and Gender Differences in Cardiovascular Medicine (0.25 ECTS, attending & presenting), KSL 487284 (only 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 / Biomedical Sciences program	Contact responsible for detailed program	10 per year 0.5 ECTS	Cardiocentro lucio.barile@cardiocentro.org	21.01.2026 02.02.2026 26.02.2026 22.04.2026 20.05.2026 10.06.2026 17.06.2026 23.09.2026 14.10.2026 18.11.2026 11.12.2026
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 0.25 ECTS	Elena Vacchi, Edoardo Lazzarini registration: elena.vacchi@eoc.ch	Dates TBD
Ion channels and Channelopathies	Ion channels background: structure-function relationship. The aim of the course is to focus on the physiological contribution of transmembrane ion channels with the	3 hours (3x 60 min) 0.25 ECTS	Cardiocentro Claudia Altomare registration: claudia.altomare@eoc.ch	Dates TBD (as soon as the min. number of participants is reached)

	particular attention to their role in the main pathological conditions.			
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	11.12.2026

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	" Innovations in cardiac electrophysiology: from tissue to computation "	Morning session 0.25 ECTS, whole day 1 ECTS	Organizer: Etienne Pruvot, Cardiology Department, CHUV Lausanne	16 Jan 2026
Example 2: CVM Mini-Symposium	" Extracellular Matrix Deficiencies and Cardiovascular Pathologies "	Morning session 0.25 ECTS, whole day 1 ECTS	Organizer: Nathalie Rosenblatt-Velin, Angiology Service, University Hospital Lausanne	25 April 2024
Symposium	" Metabolism in Aging and Disease "	Max. 1 ECTS (0.25 ECTS for participation in the talk sessions only, and additional ECTS for talk/poster)	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.	19 May 2026
CVM Course	Biostatistics for non-statisticians - good practices, misuse and pitfalls : The course aims to explain the importance of	3 half-days 1 ECTS	Romain-Daniel Gosselin, Precision Medicine Unit, CHUV	Dates TBA

	biostatistics for science reproducibility/ reliability and teach good practices. The lectures are tailored to biologists and concentrate on logic thinking: no heavy mathematics.			
CVM Tutorials	Tutorial on a specific topic. One example in the next row.	5x 2h sessions 1 ECTS		5x 2h
Example 1: CVM Tutorial	Genetics of Inherited Cardiac Diseases : 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 website .	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 website .	1-2 days courses, 0.5 ECTS per day		
IRTG 1123 Retreat	Annual Retreats. More info on the website	0.5 ECTS per day, 1-2 days		