

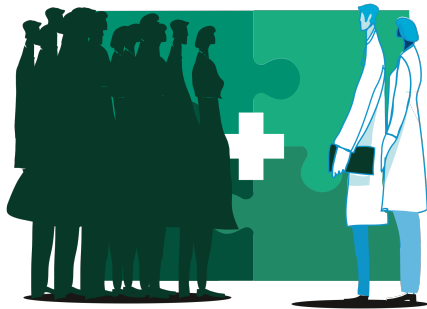


PHD Specialization in Precision Medicine

Program Description

TRADITIONAL MEDICINE

Same treatment for all



PRECISION MEDICINE

Best treatment per patient



Introduction

Precision Medicine (PM) is a new healthcare approach. It tailors treatments to each patient's unique genetic predisposition, molecular makeup, lifestyle, and environmental factors. It can lead to measurable health improvements via:

- **Improved patient outcomes**, by matching patients with the treatments that are most likely to be effective for them. This helps to improve survival rates, reduce recurrence rates, and improve quality of life.
- **Reduced side effects**, by avoiding treatments that are likely to be ineffective or harmful for a particular patient. This makes treatment more tolerable, and it may improve the overall quality of life for patients.
- **Lower costs**, by avoiding unnecessary treatments and by targeting treatments to the patients who are most likely to benefit from them. This can lower the overall costs for the healthcare system.

The PhD Specialization in Precision Medicine is a cutting-edge and interdisciplinary education program on the subject. It addresses motivated PhD and MD-PhD students coming from the fields of human and veterinary medicine, biomedicine, biochemistry, immunology, pharmaceutical sciences, bioinformatics, (molecular) biology and similar (or other) scientific topics – as long as they have a credible interest in Precision Medicine and can be enrolled in the Graduate School for Cellular and Biomedical Sciences (GCB).

Organization

The PhD specialization in Precision Medicine is organized in close collaboration between the Graduate School for Cellular and Biomedical Sciences (GCB) and the Bern Center for Precision Medicine (BCPM). The coordinators are:

- Prof. Dr. Carlo Largiadèr (scientific coordinator).
- Timo Staub (administrative coordinator).
- Both Claudia Requeta and Timo Staub work as the administrative contacts. Tel. +41 (0)31 684 04 39, info.bcpm@unibe.ch.

Planned Start

HS 2024.

Registration

Students should first be enrolled in the GCB and then should separately register to the PM PhD Specialization program. See the step-by-step registration guide below.

Target Group

PhD and MD-PhD students enrolled in the GCB who perform research on Precision Medicine.

Curricular Requirement

The curricular requirements will be fixed in the PhD Doctoral Agreement (DA) according to the rules of the GCB. Courses might vary according to the doctoral student's prior knowledge and needs with respect to the PhD thesis, but each student must obtain a minimum of 10 ECTS. The program is divided into three sections:

- *A mandatory part* (4 ECTS), which every student has to do in the same way. This consists of the module about Precision Medicine, as organized by the BCPM (with both tracks and 3 ECTS graded by a written exam), and at least one participation in the summer school co-organized by the Bern Center for Precision Medicine (with an own contribution via presentation or poster session).

Following the rules of the Graduate School for Cellular and Biomedical Sciences, there are other mandatory lessons which have to be done (lecture about scientific integrity, participation in the GCB Symposium starting the 2nd year of the PhD studies).

- *An elective part* (6 ECTS), where courses can be chosen among the ones relevant for precision medicine, and/or the specific needs of the doctoral students as discussed with the PhD supervisor.
- Participation in *journal clubs and/or research presentations/conferences*, as organized by the BCPM. Some of these might give ECTS points (if the student has an own contribution), which would be added to the ECTS points mentioned in the elective part above.

Mandatory part, details:

Module	Reference	ECTS
Lecture: Introduction to Precision Medicine: intro and examples, gender medicine, intro to molecular medicine, data protection and ethics, gene therapy, data research and bioinformatics, pharmacogenomics, use of PM in	KSL No. 473286	3

cancer research and treatment, organoids, clinical study design, GWAS, rare diseases.		
International Summer School , as planned in cooperation with the Institute of Pharmacology (details will follow).	Three days somewhere, with a personal contribution.	1
Course about scientific integrity (and other mandatory events such as the GCB symposium)	As organized/demanded by the GCB	-

Possible combination of elective courses, journal clubs and conference participations:

Module	Reference	ECTS
Book Club/Seminar: Epidemiology, with the epidemiologic approach to disease and intervention, measures used in epidemiologic studies, use of epidemiology to identify the cause of disease, review study designs and the interpretation of their findings, evaluations of health services, screening programs and policy.	KSL No. 10416	1
Lecture: Drug Delivery and Drug Targeting, with a particular focus on advanced approaches such as the principles of nanomedicine, principles of targeted drug delivery, cell-inspired therapies, 3D printing in pharmaceuticals, advanced ophthalmic drug delivery, immunomodulating nanomedicine, stimuli-responsive drug delivery.	KSL No. 468464	1.5
Lecture: Cell Biology II, with control of gene expression, cellular signaling, cell cycle / apoptosis, tissues, stem cells and cancer.	KSL No. 1542	1.5
Lecture: Applied Optical Spectroscopy in Chemical Biology, focusing on the applied aspects of absorption, fluorescence, circular dichroism (CD) and linear dichroism (LD) spectroscopies, and how they can be used in chemical biology, organic chemistry, biochemistry and other sciences to study labelled macromolecules (DNA, proteins).	KSL No. 407144	1.5
Seminar: Participation in regular BCPM events/seminars, with own contributions	As organized by the BCPM	0.5
Seminar: Participation in regular BCPM events/seminars, without own contributions	As organized by the BCPM	-

(as of 2023 – for available courses, see the KSL system via https://www.gcb.unibe.ch/training/course_catalog)

Diploma Supplement

After completion of the PhD, the additional specialization of the PhD program in Precision Medicine will be honored with a diploma supplement detailing the additional coursework and effort.

We encourage PhD students of the University of Bern with a research interest in the new and growing field of Precision Medicine to enroll in this program, as they will definitely profit from this special education.

Step-by-step Registration Guide for future Precision Medicine PhD Students

Students that have already started their PhD without or in another specialization:

1. Student looks at the courses he/she has done so far and his/her doctoral agreement (DA).
2. Student checks what can be accredited for the curriculum in Precision Medicine (PM) and if there is still enough time to take additional courses, discusses with supervisor.
3. Student discusses with mentor and supervisor, adapts DA to fulfil GCB and PM PhD specialization requirements.
4. Student submits registration to the PM PhD Specialization Admin with: (1) signed registration form, (2) brief description of research work, (3) DA, with the courses the student wants to count for the PM PhD specialization marked-up with a star (*). At this point, no signature in the DA is required.
5. PM PhD Specialization Admin checks the application documents and the DA, to see if formally all requirements can be met. Discusses with all involved parties (e.g., GCB) if the student will be accepted.
6. PM PhD Specialization Admin sends an email to student to inform if he/she is accepted to the program
7. Student sends the adapted DA signed by supervisor and mentor to the GCB.

New students:

1. Student enrolls in university.
2. Student applies to the GCB.
3. Following the GCB interview, student discusses with mentor and supervisor, fills in doctoral agreement (DA) taking into account all criteria to fulfil the GCB and the PM curriculum.
4. Student submits registration to the PM PhD Specialization Admin with: (1) signed registration form, (2) brief description of research work, (3) DA, with the courses the student wants to count for the PM PhD specialization marked-up with a star (*). At this point, no signature in the DA is required.
5. PM PhD Specialization Admin checks the application documents and the DA, to see if formally all requirements can be met. Discusses with all involved parties (e.g., GCB) if the student will be accepted.
6. PM PhD Specialization Admin sends an email to student to inform if he/she is accepted to the program
7. Student sends the adapted DA signed by supervisor and mentor to the GCB.

Submissions to the PM PhD Specialization Admin are done via e-mail to info.bcpm@unibe.ch with a copy to timo.staub@unibe.ch and claudia.requeta@unibe.ch