

BIO-491: New tools & research strategies in personalized health
Spring Semester 2025 - Group project

The Genome of Switzerland: Population Genomic Reference

Objective: To assess multidisciplinary aspects essential for the development of national initiative the Genome of Switzerland.

Description: Human health-related genomics requires large and diverse datasets for delivering reliable information. It has been shown convincingly that nationally representative population-based genomic data is a prerequisite to advance biomedical research and to implement applications of genomic medicine for the benefits of patients and citizens in a country. Accordingly, most countries in Europe and increasing number of countries worldwide have started generating genomic datasets that represent their population.

Imagine that you are part of the leading group in charge of the Genome of Switzerland, the first national population and genomic medicine initiative that aims to sequence a genomic dataset representative of the contemporary Swiss population and to create a national reference dataset.

This project aims to leverage multidisciplinary background and various interest and opinions of students for assessing diverse aspects related to population-scale genomics and implementation of genomic medicine.

In addition to group work with resources and discussions, you will benefit from meetings with experts in the fields closely connected to population genomic initiatives, such as biobanking, population genomic research, big data analysis and implementation of genomic medicine. The project mentor will provide you with relevant references and will support your group work with instructive feedback.

Outcome: Analysis and group presentation that addresses a selection (of your choice) of the following aspects essential for planning and executing a project for generating a national genomic reference dataset

- Motivation, benefits and use cases of national genomic reference dataset
- Design of the cohort and sample recruitment
- Data generation, data types and choice of sequencing platforms
- Data analysis, characterization of population genetic map and showcasing use of reference dataset
- Data storage, access and exchange, re-analysis potential of genomic data
- International initiatives to align with, cross-border data access, potential to scale a national dataset to international level
- Ethical and societal aspects, public trust, outreach, engagement of relevant stakeholders and general public

Mentor:

Katrin Männik, Health2030 Genome Center, [LinkedIn](#)

Confirmed experts:

Sabine Bavamian, Swiss Biobanking Platform, [LinkedIn](#)

Robin Hofmeister, University of Lausanne and Estonian Genome Center, [LinkedIn](#)

Useful examples:

[Genome of Europe](#)

[European 1+ Million Genomes Initiative](#)

[FinnGen](#)

[Estonian Biobank](#)

[All of Us Research Program](#)