

MSc programs in Switzerland

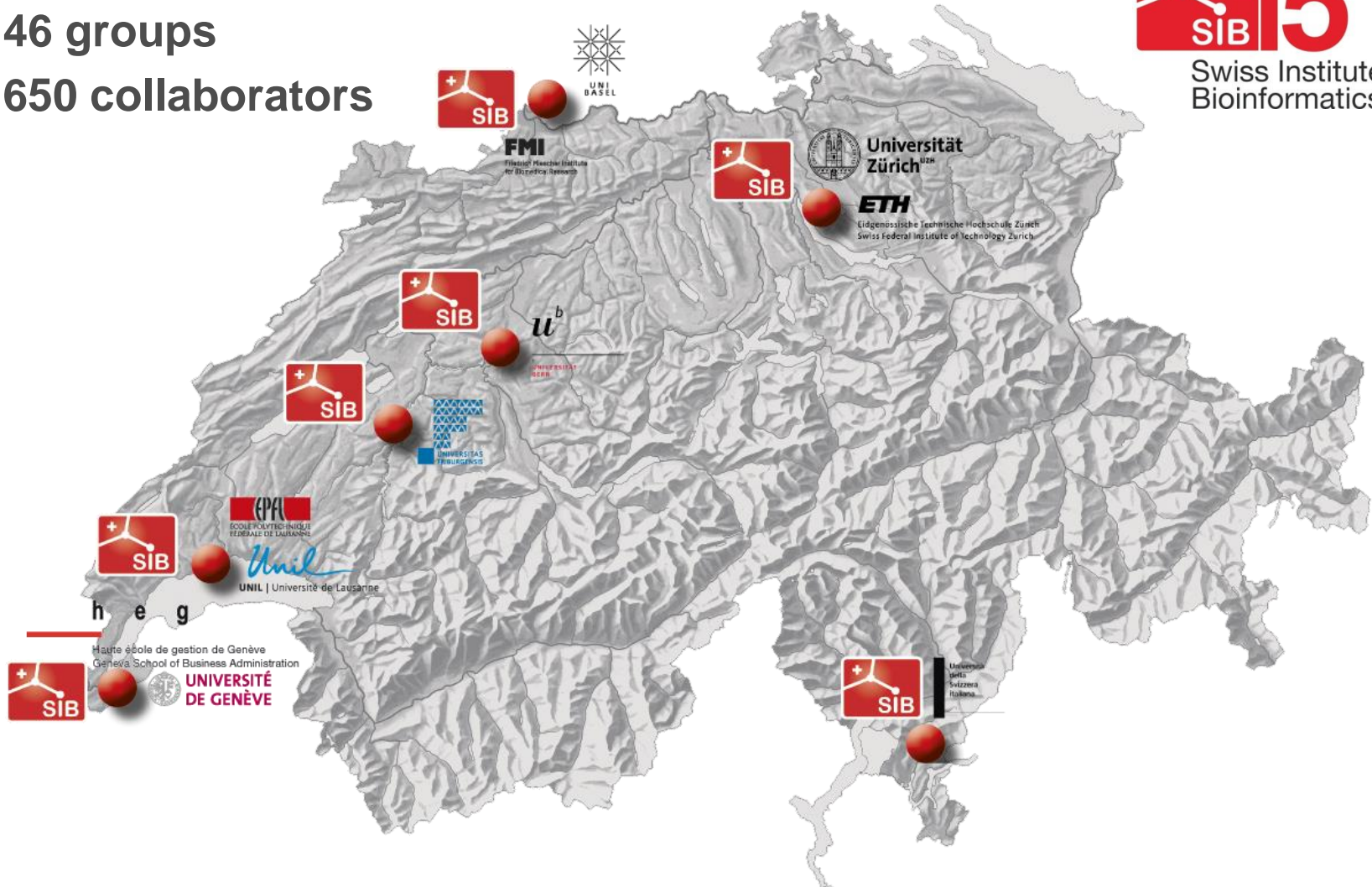
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Swiss Institute of
Bioinformatics

SIB Today

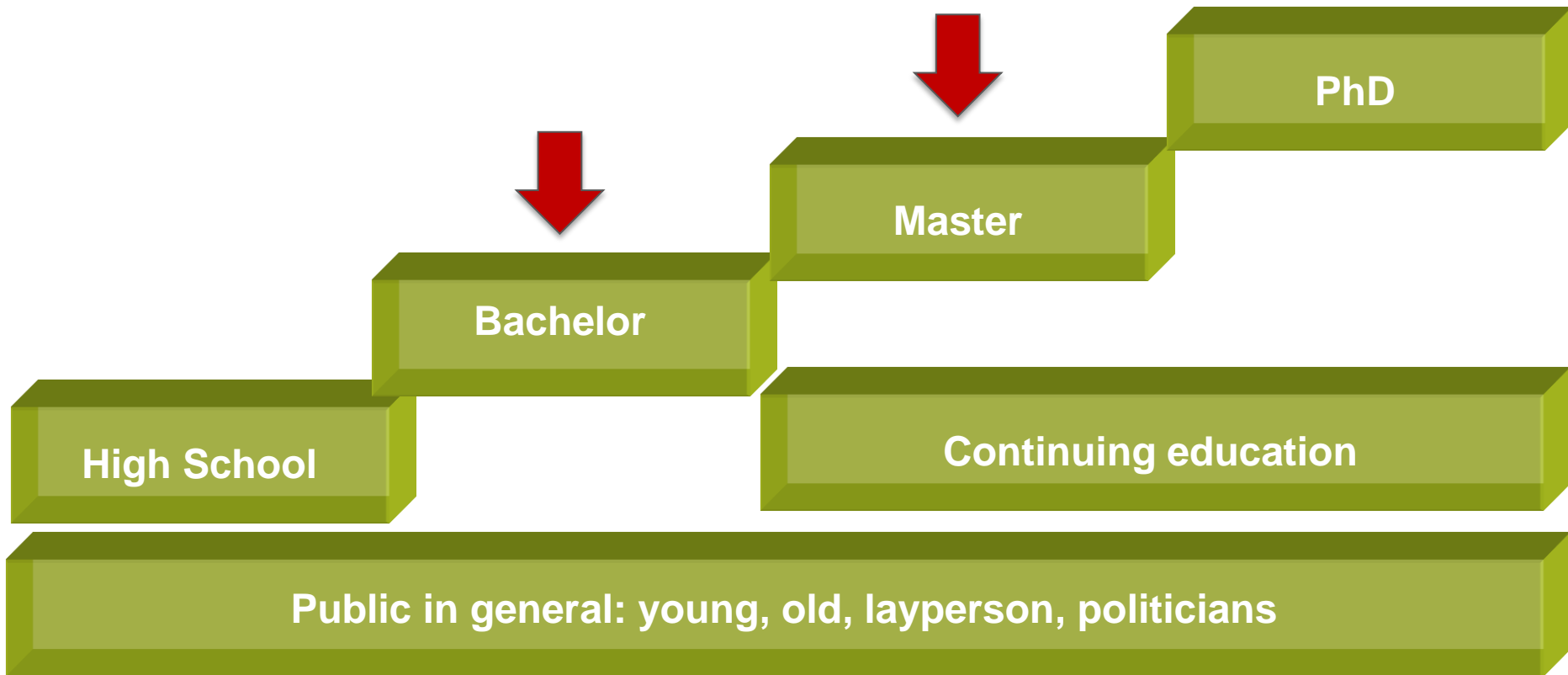
- 46 groups
- 650 collaborators



Four strategic goals



SIB Education, Training and Outreach Activities



Bachelor and Master degrees

- SIB coordinates under-graduate education in bioinformatics together with Swiss Universities

Bachelor degree

- **Basel**

Master degree

- **Geneva and Lausanne**
- **Zurich**
- **Basel**
- **Bern and Fribourg**

Basel

BSc in Computational Sciences with a major in Computational Biology

- 1st year: math, physics, chemistry, and informatics
- 2nd and 3rd years (major): computational biology, bioinformatics, biophysics, systems biology, molecular and structural biology

Geneva and Lausanne – long history

- 1999 – 2004:
 - MSc in Bioinformatics Ge-Lau
- 2004 – 2011:
 - MSc in Proteomics & Bioinformatics Ge
- 2011 – today:
 - Joint specialisation in Bioinformatics inside the MSc in Biology Ge-Lau
- Future:
 - specialisation in Bioinformatics inside the MSc in Biology in Ge
 - specialisation in Bioinformatics inside the MSc in Biology in Lau

MSc in Bioinformatics Ge-Lau

Module	Title of the module	Responsible(s)	Credits
1	Introduction to bioinformatics	A. Bairoch	7
2	Standardizing courses:		7
2a	For students with a computer sciences background: Biochemistry I Elements of biology	M. Ballivet et F. Barja	
2b	For students with a life-sciences background: Algorithms and programming	B. Chopard et C. Pellegrini	
3	Databases for life sciences	R. Appel et A. Bairoch	6
4	Statistics and probability	D. Goldstein	6

MSc in Bioinformatics Ge-Lau

Second semester:

The second semester takes place in Lausanne with the exception of module 7 that takes place in Geneva. It consists of 4 modules and it counts for 26 credits.

Module	Title of the module	Responsible(s)	Credits
5	Algorithmic methods for molecular sequence analysis	P. Bucher et C. Notredame	7
6	Analysis of protein structures	T. Schwede	6
7	Phylogenetics analysis	G. Bittar	6
8	Genomics, transcriptomics and proteomics analysis	V. Jongeneel	7

Practical training:

Each student must do a practical training in one of the SIB's groups or in a recognised laboratory or company of bioinformatics (in Switzerland or abroad). It can be done during summer (after the last exam section) or during the third or fourth semester.

Module	Title of the module	Responsible(s)	Credits
9	Practical training	P. Palagi	8

MSc in Bioinformatics Ge-Lau

1 or 1.5 year

Masters thesis

summer

Mandatory courses

2nd sem.

Mandatory courses

1st sem.

MSc in Proteo. & Bioinf. Ge

- Elements of Bioinformatics
- Programming for bioinformatics
- Statistics and probability

1.5 year

Masters thesis

3rd sem.

**Optional courses
&
Masters thesis**

2nd sem.

Mandatory courses

1st sem.

MSc Biology Major Bioinf. Ge-Lau

- Elements of Bioinformatics
- Programming for bioinformatics
- Statistics and probability

1.5 year

Masters thesis

3rd sem.

**Optional courses
&
Masters thesis**

2nd sem.

Mandatory courses

1st sem.

MSc Biology Major Bioinf. Ge-Lau

- Elements of Bioinformatics
- Programming for bioinformatics
- Statistics and probability
- Sequence a genome
- 1st steps in programming

1.5 year

Masters thesis

3rd sem.

**Optional courses
&
Masters thesis**

2nd sem.

Mandatory courses

1st sem.

MSc Biology Major Bioinf. Basel

1.5 year

Masters thesis

3rd sem.

Masters thesis

2nd sem.

Optional courses

1st sem.

Zurich

- Master's in Computational Biology and Bioinformatics
- Jointly organised by: ETHZ and Univ. Zurich

MASTER THESIS	30 credit points	1.5 YEAR
LAB ROTATIONS	9 credit points	
GENERAL COURSES	21 credit points	
CORE BIOINFORMATICS	30 credit points	
PREPARATION (depending on the Bachelors degree)		
BACHELOR in: Biology, Chemistry, Mathematics, Physics, Computer Science or Engineering		

Zurich

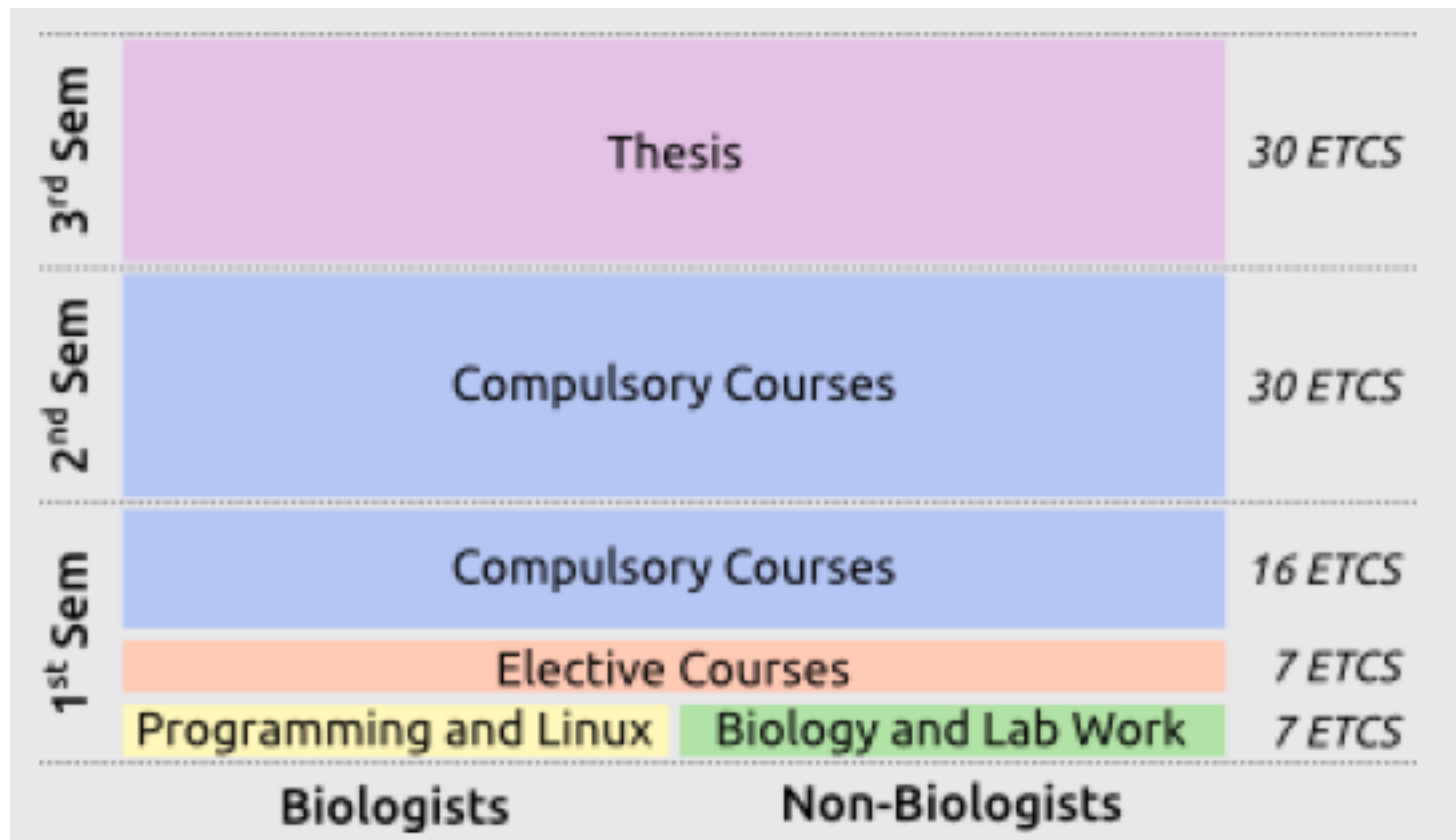
Core Bioinformatics grouped in 3 focus areas:

- Structures: molecular modeling, structural bioinformatics
- Sequences: sequence analysis, alignment, phylogenetic trees
- Systems: modeling and analysis of biological networks

At least one course from each of the three focus areas has to be attended

Bern and Fribourg

- Master's in Bioinformatics and Computational Biology
- Jointly organised by: Universities of Bern and Fribourg



Conclusions (just some)

- MSc cross institutions: need to have a common understanding since the start
- MSc in bioinformatics is difficult to be research driven: pre-required knowledge
- Define these pre-requirements early: otherwise too much time spent in filling the gaps

Thank You



Swiss Institute of
Bioinformatics