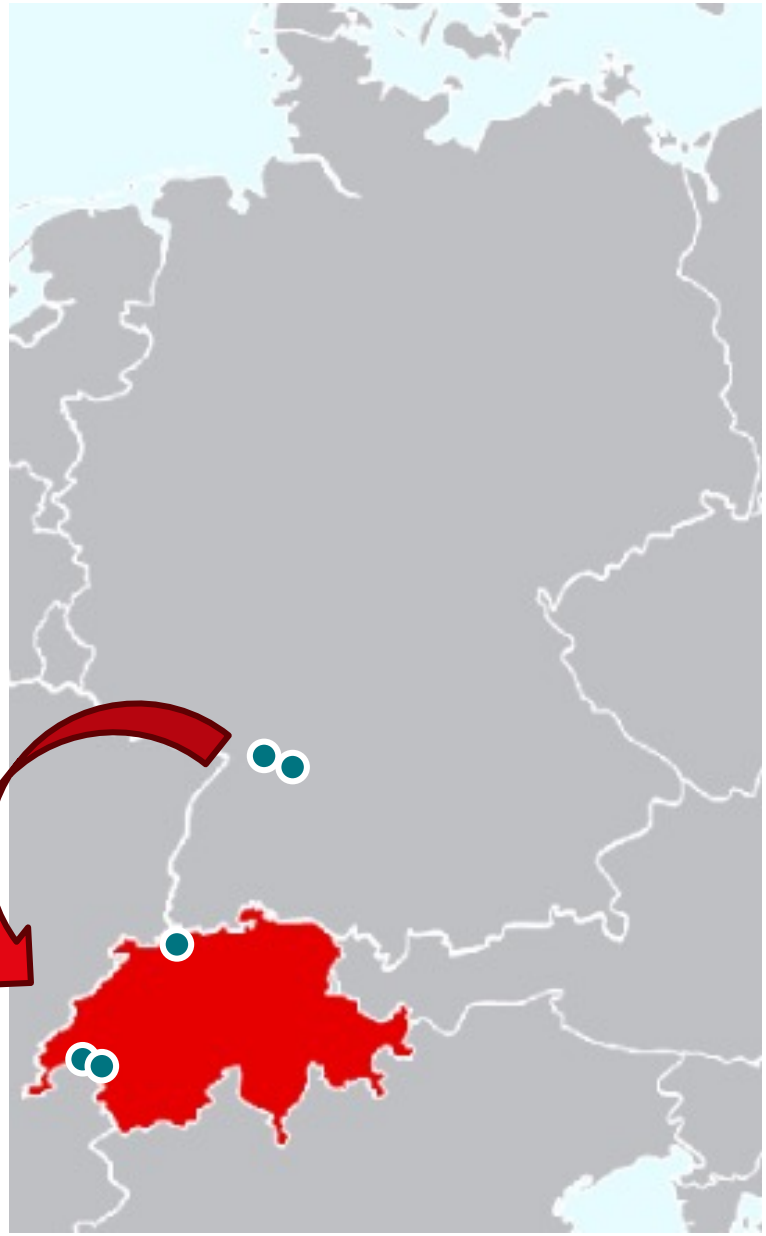
Welcome to the lab!

Dr. Alexandra Bezler

September 2025



My scientific journey

Lecturer
- EPFL, Switzerland

Scientist
- UNIL, Switzerland
- EPFL, Switzerland

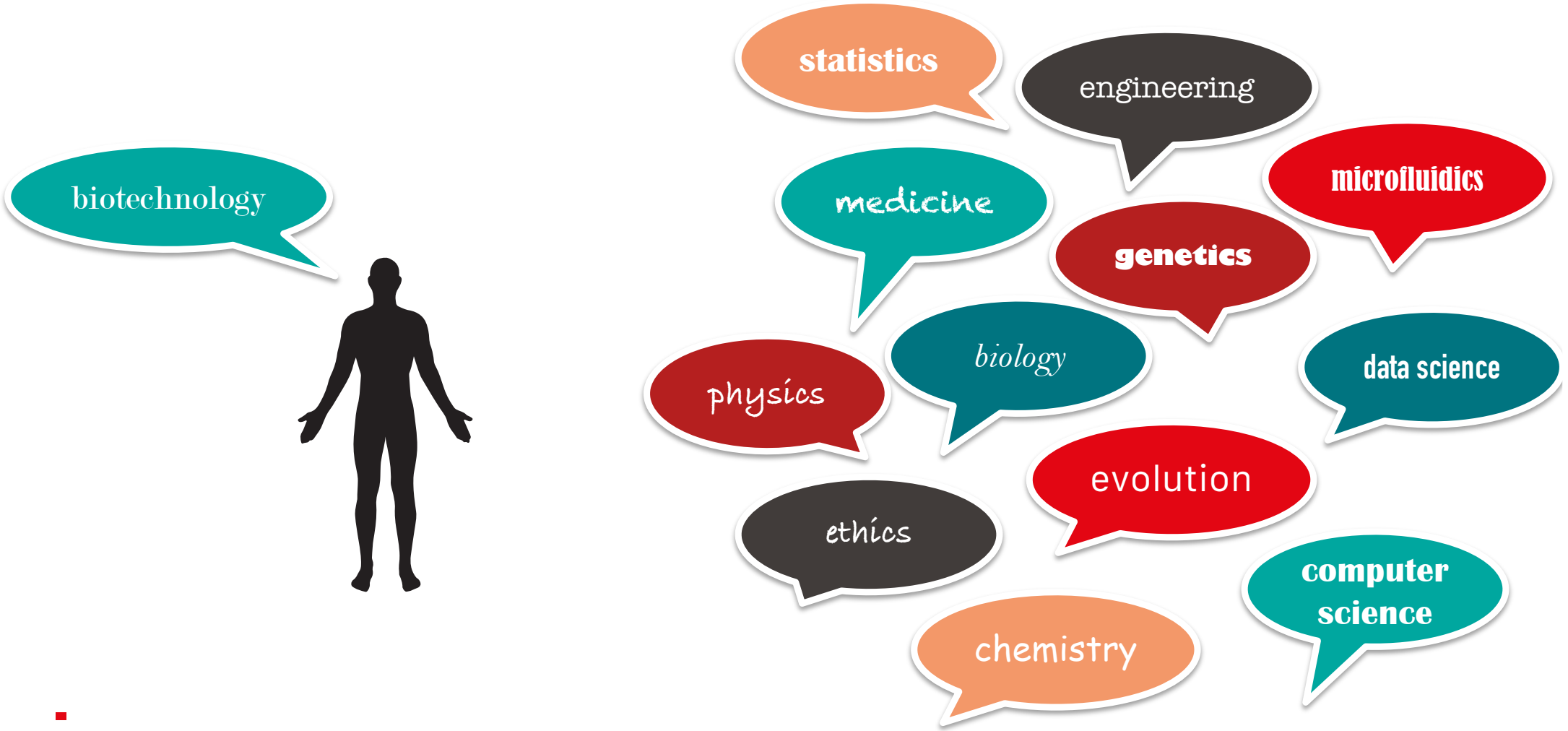
PhD
- EPFL, Switzerland

Research Internships
- Syndey, Australia
- FMI Basel, Switzerland
- EMBL, Heidelberg, Germany
- LionBiosciences, Heidelberg, Germany

MSc Biotechnology, Mannheim, Germany

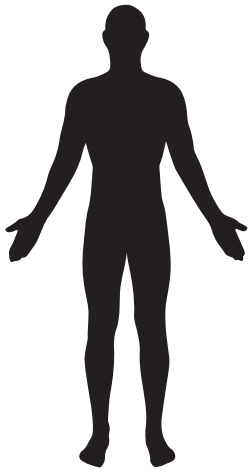

Greetings to all of you who made the journey enjoyable!

Speaking Science



Predictions on your future career:

1. Working with:



2. Speaking:

Working in a group

1) Embrace diversity

2) The team is better than you

3) Communication is key

This week

Tuesday

- Course overview
- Benchling software – in class
- Biosafety training – at home

Friday

- Figures and figure legends
- Electronic lab notebook

Labo intégré en sciences de la vie

Put theory into practice!

Theoretical background:

- Biologie générale BIOENG-110
- Biologie moléculaire et cellulaire I+II BIO-205 +BIO-207

Practical Work Prepares you for:

Bachelor project

Interdisciplinary projects (MAKE)

Master project

Internship

Career in Life Sciences

Learning Outcomes

- To learn **basic techniques** in molecular biology and biochemistry
- To acquire **good laboratory practice**
- To built skills in **recording and analyzing** data
- To write a **scientific report/ poster**
- To use specific **software**
- To work in **any team**

➡ **Career in Life Sciences**

1-year Project

Fall semester

Clone pancreatic α-amylase cDNA into an expression plasmid

Spring semester

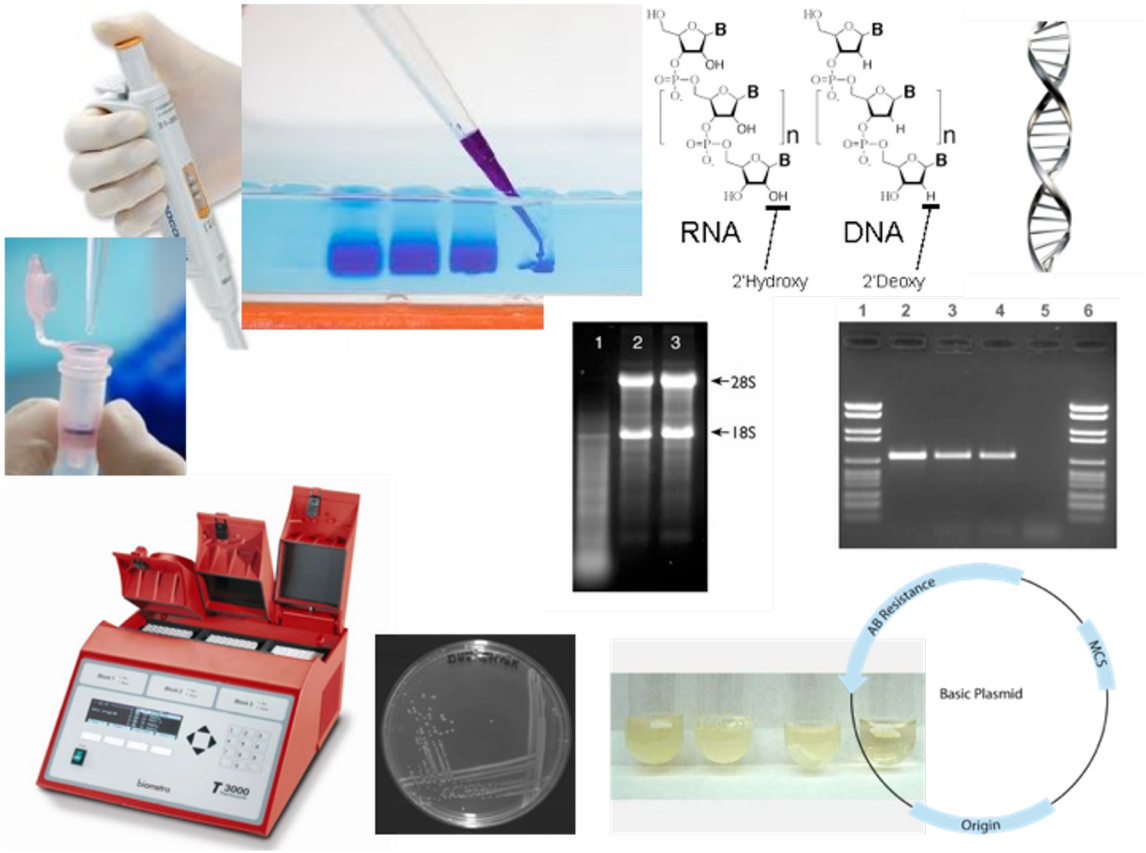
Express recombinant α-amylase in a mammalian cell line

Workflow autumn semester

Lab 1	Lab 2	Lab 3
Micropipetting	RNA Isolation	PCR

Lab 4	Lab 5	No Lab
Ligation + Transformation	Plasmid Isolation + Digestion	Report and Revision

BIO-203:
Work with RNA, DNA, Bacteria

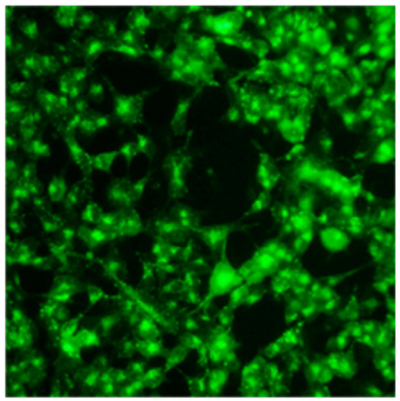
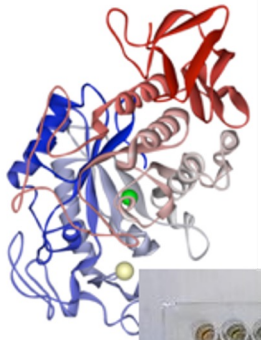


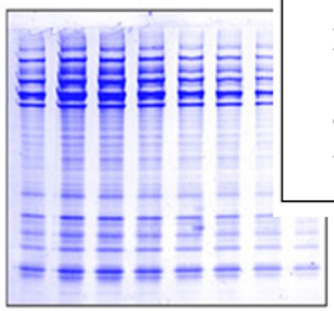
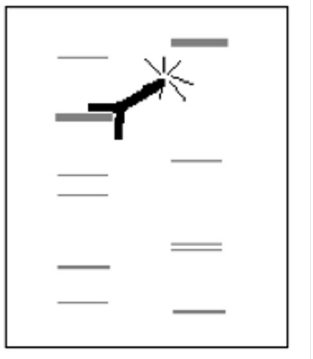
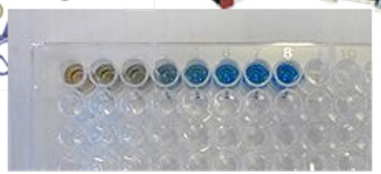
Workflow spring semester

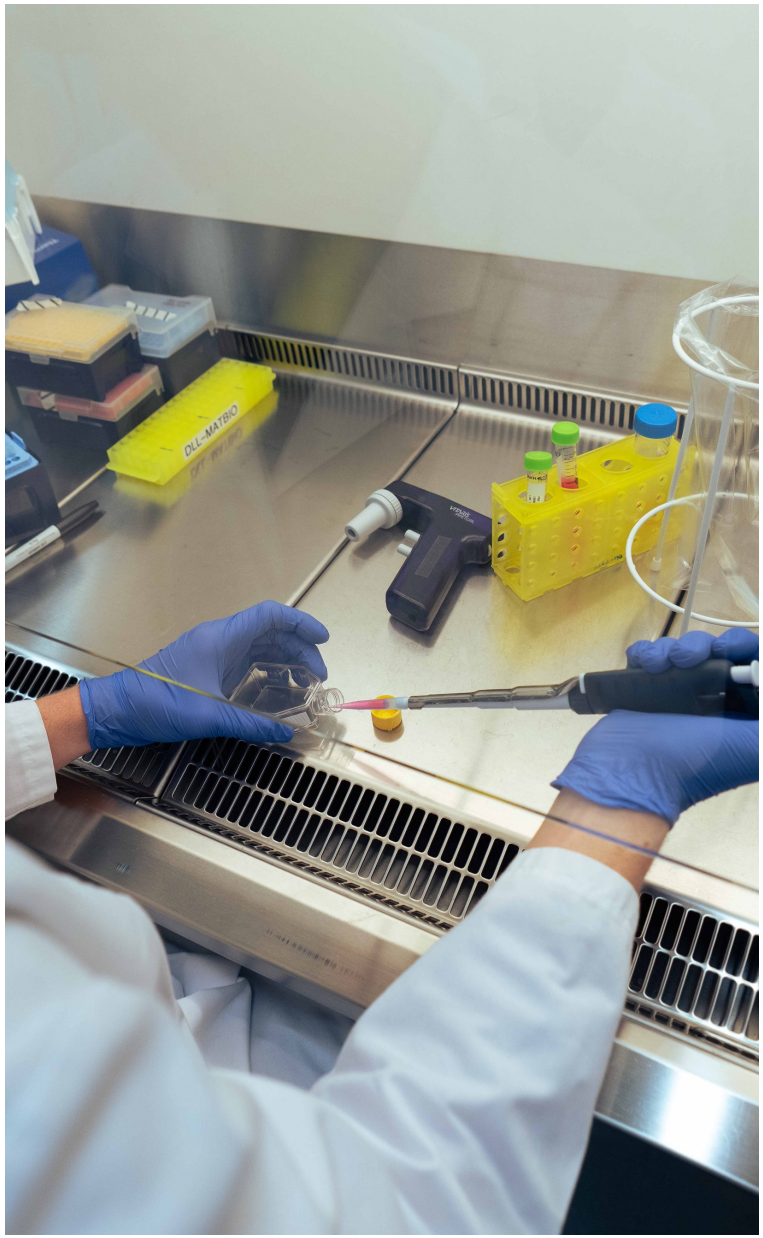
Lab 6	Lab 7	Lab 8
Sequence analysis	Transfection into mammalian cells	Affinity purification

Lab 9	Lab 10	Lab 11
Separation of proteins by SDS-PAGE	Western blot + Activity assay	Enzyme kinetics

BIO-204:
Work with Proteins, Mammalian Cells



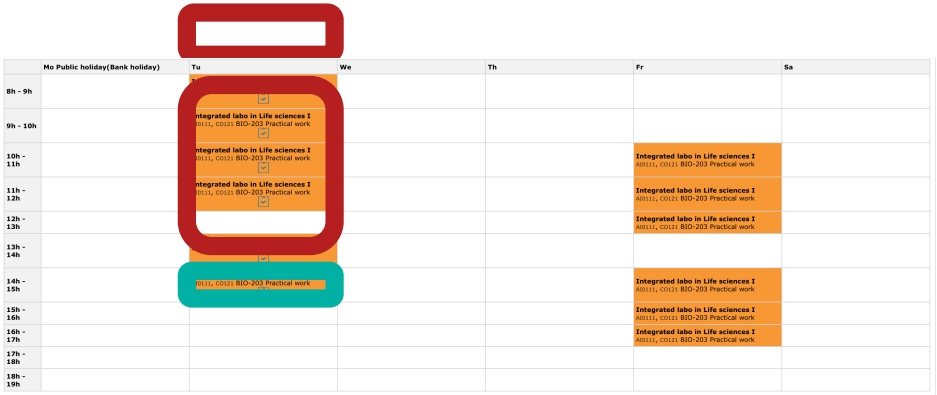
Practical lab sessions: every two weeks

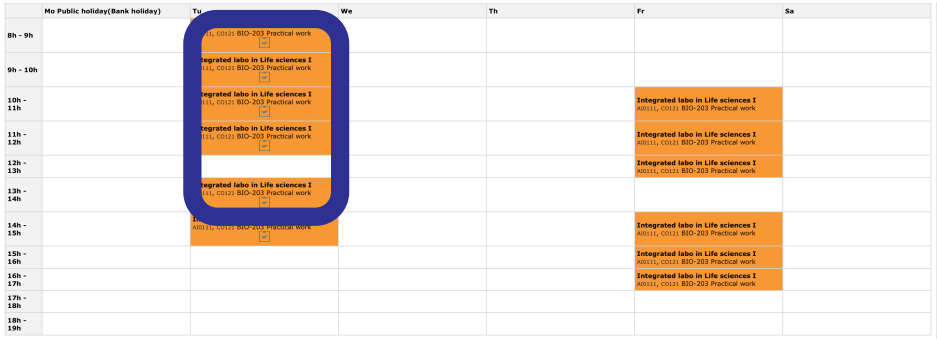
- Lab AI0111, last approximately 3-4 hours
- Breaks: according to experiments, in agreement with your group/ assistant
- Weekly workload during semester: 6 hours
  - read protocols BEFORE lab session
  - exercises, data analysis, writing lab notebook and report/ poster
  - more outside class tasks than regular classes (with every week lectures)
- Total: 90 hours corresponding to 3 ECTS
- Rooms reserved for outside lab tasks (see ISA)

How to distribute the work

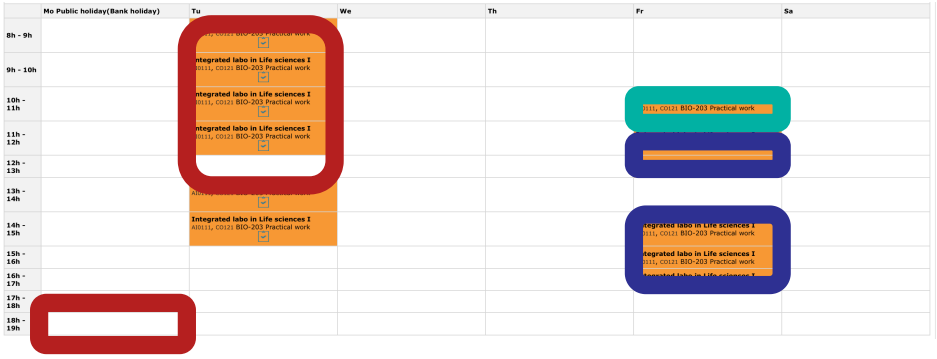
Example group A/C:
Distribute work during week

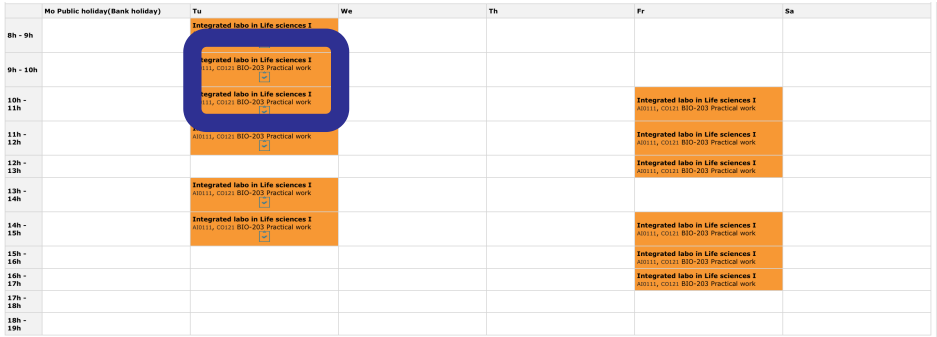
student 1- ALL IN TUEASDAYS





student 2- SPREAD ACROSS WEEK





Teamwork

Lab work

- Share tasks among group members, rotate responsibilities

Questions & Exercises

- Discuss with fellow students/ assistants

Lab report/ poster

- Group members are expected to equally contribute

Conflict within the group?

- Inform your assistant or course instructor

Challenges you might encounter

Calvin & Hobbes
by Bill Waterson

- noise
- light
- smell
- crowded spaces
- new people/ space
- etc

reach out

Lab Safety Rules

- Wear long trousers & closed shoes
- Wear a lab coat – provided
- Wear gloves - think!
- Wear goggles - think!
- Tie up long hair
- No food and drinks in TP lab

- Clean up before you leave

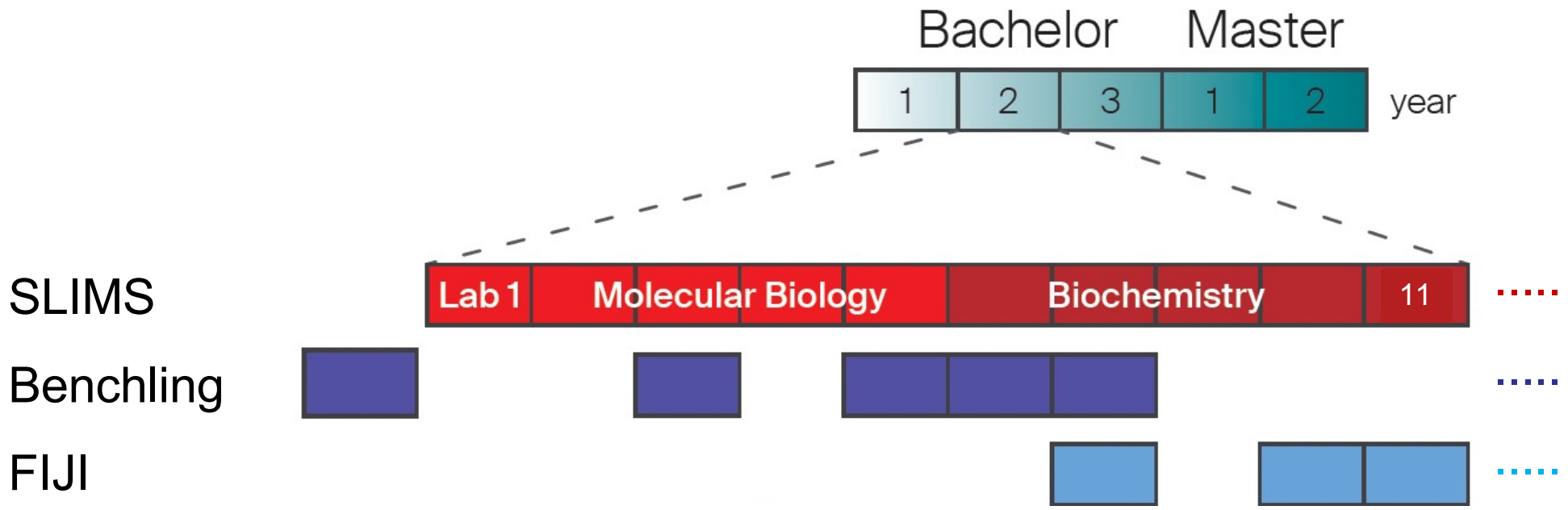
International Team of Assistants

career

Language

		
Course documents & presentations	+	
Assistants speak	+	some
Ask questions	+	+
Exam questions	+	+
Lab notebook & reports	encouraged	allowed

Software Tools



Workshops

Getting started with Benchling software

Creating effective scientific figures and legends

How to analyse scientific data

How to write a scientific report

See Moodle

Evaluation

Continuous control	December	December	
Electronic Lab Notebook	Lab Report/ Poster 1	Exam	LISV I
Continuous control	May	May	
Electronic Lab Notebook	Lab Report/ Poster 2	Exam	LISV II
40%	30%	30%	Final grade

Laboratory Notebook

- A lab notebook is a **legal document** (publication, patents)
- A **record of everything you do** in the lab and **why**
- All **data** must be entered and labeled with an adequate description

Electronic Laboratory Notebook (ELN)

- Each student writes an individual lab notebook
- Preformatted content for each lab session
- Must be completed one week after the lab session

- Assistants will give feedback the week after (Moodle/ SLIMS)
- Use the feedback to improve

Final Laboratory Report/ Poster

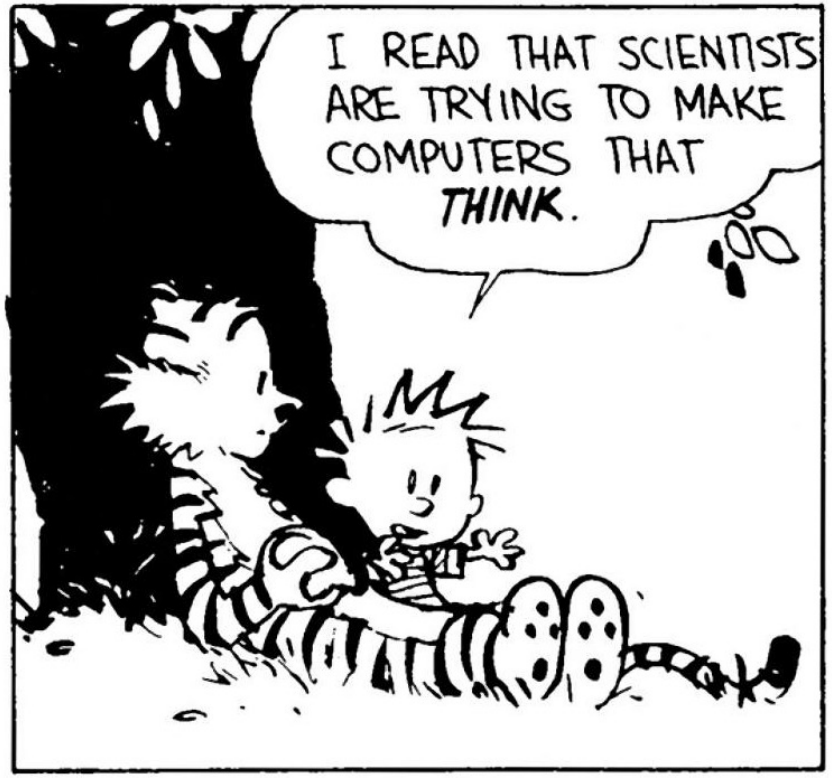
- Submitted at the end of the semester
- Guidelines will be posted on Moodle

- Describe the aims, experiments, results and discussion of the data (figures + figure legends)

Use of AI

- Be critical
- Allowed for text only
- Not for data analysis/ images

- You are responsible for
  - your learning
  - your submissions



Exam

- Multiple choice questions
- December 16

Class Representatives

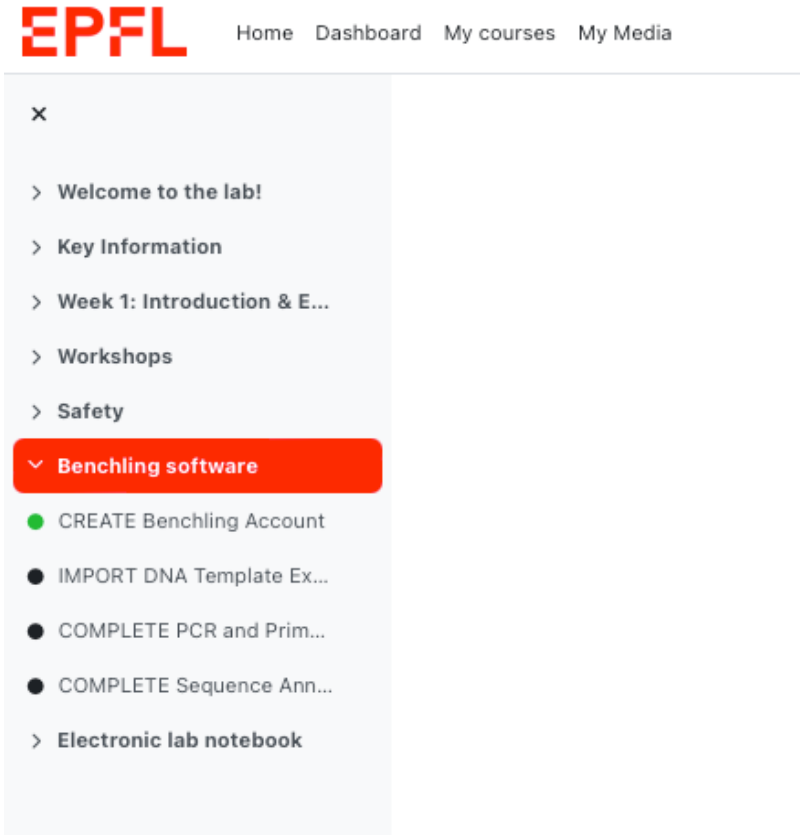
- Please contact me after election

Questions ?

Moodle

- show how to navigate menu on left side
- ‘mark as done’

- to focus on a topic close unused tabs



EPFL

Intro Benchling Software

Dr. Alexandra Bezler

image source
Benchling.com

Benchling: What? Why?

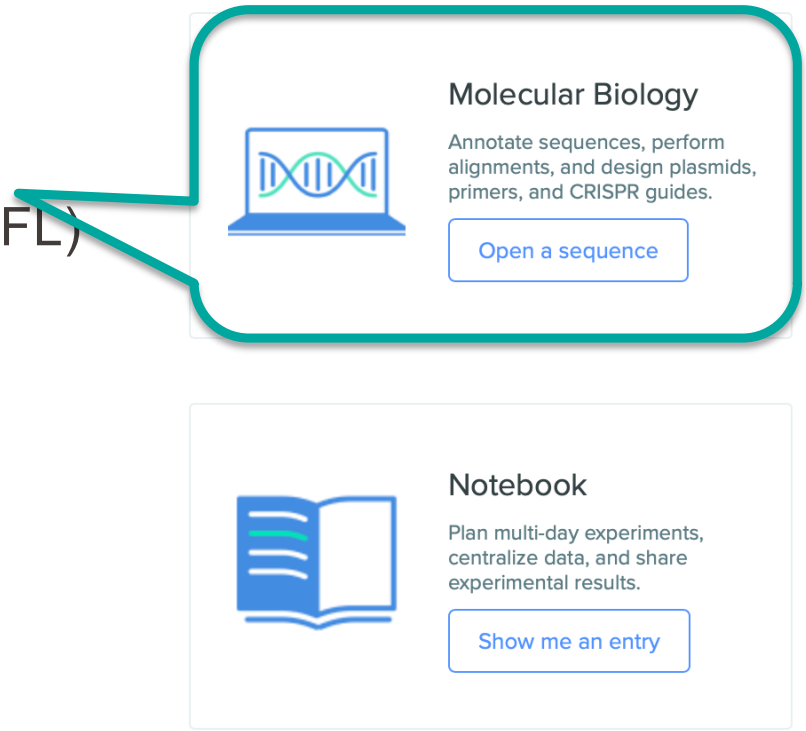
DNA sequence visualization + analysis

Professional tool (used in industry + EPFL)

Cloud based software

Basics quick to learn

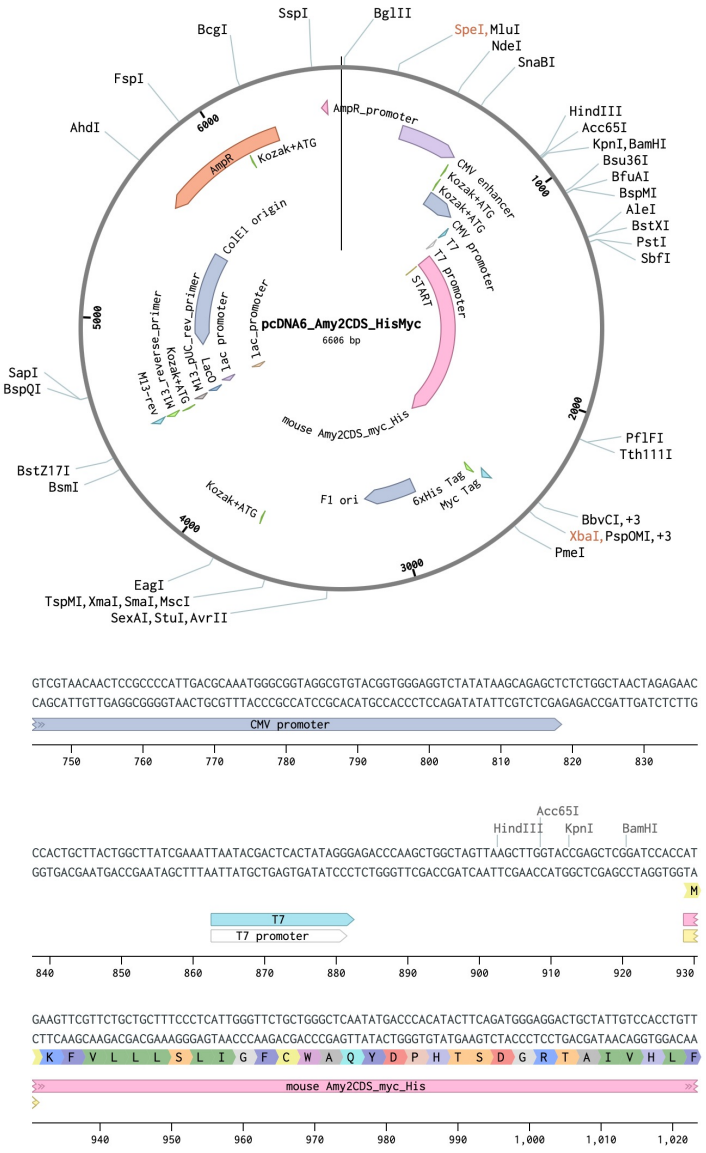
‘How to’ tutorials



Using Molecular Biology Tools

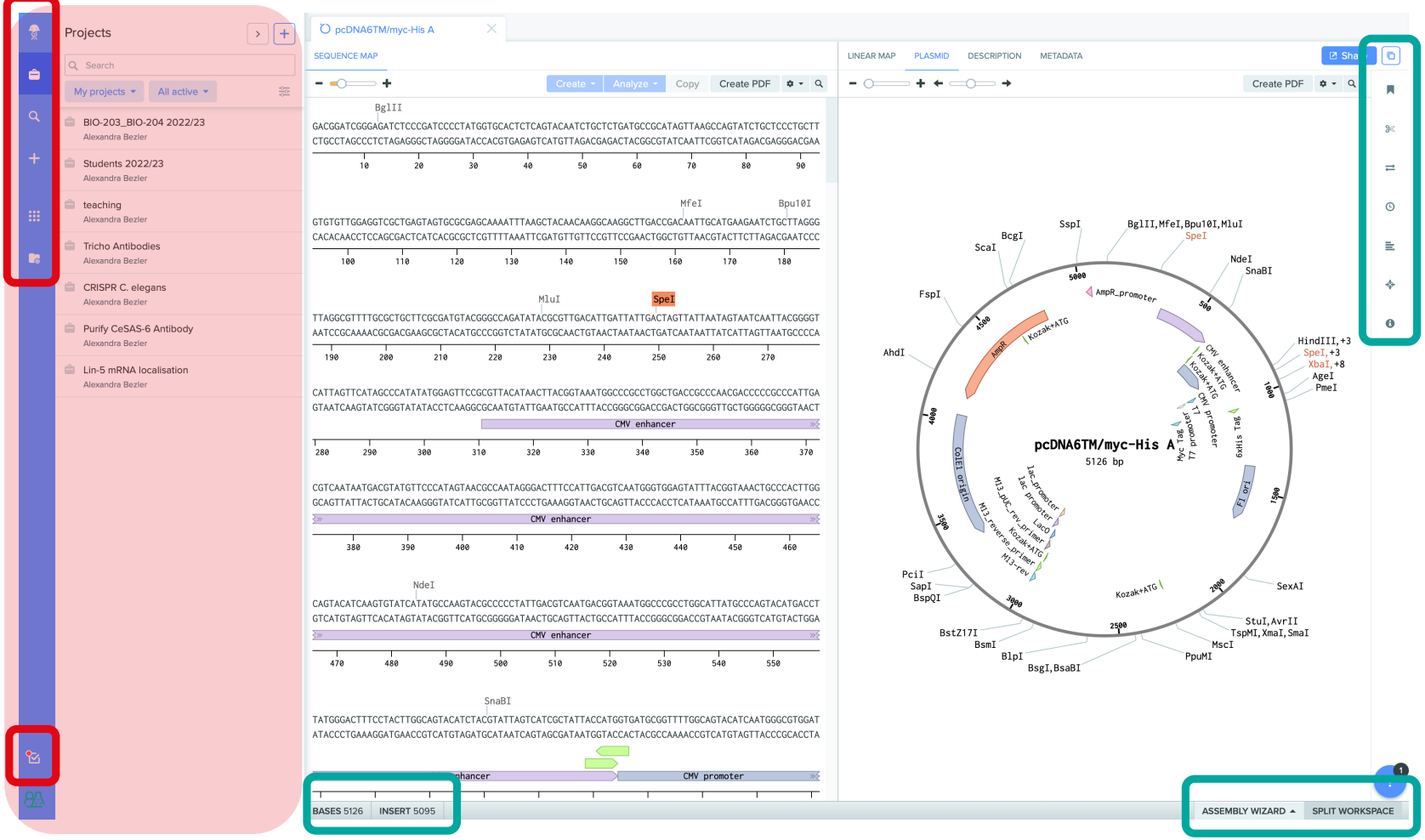
BIO-203/ BIO-204:

- annotate sequences
- restriction digest
- primer design
- translation
- sequence alignment
- virtual cloning



Account

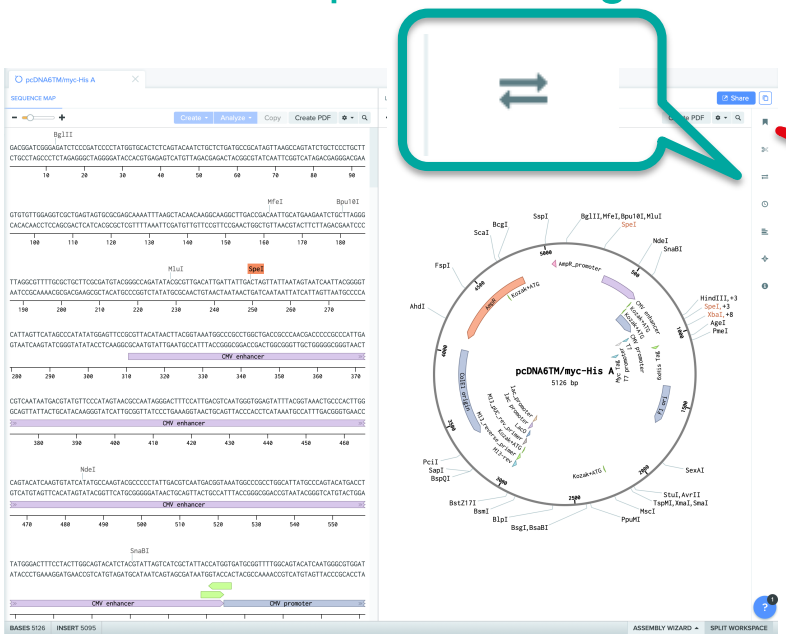
Molecular Biology



Your turn to play:
See Moodle Benchling

Worked example 1

PCR and primer design



Worked Example 2

Sequence annotation

first copy file to your account

Your tasks

Today

- ✓ create Benchling account
- ✓ exercise 1
- ✓ exercise 2

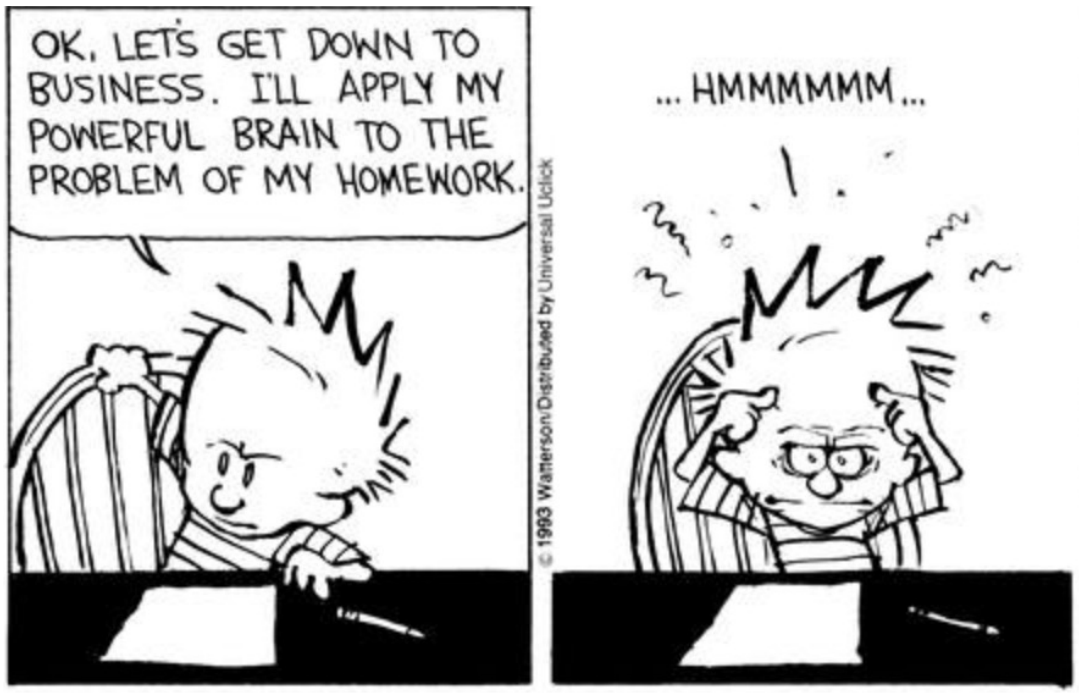
Homework

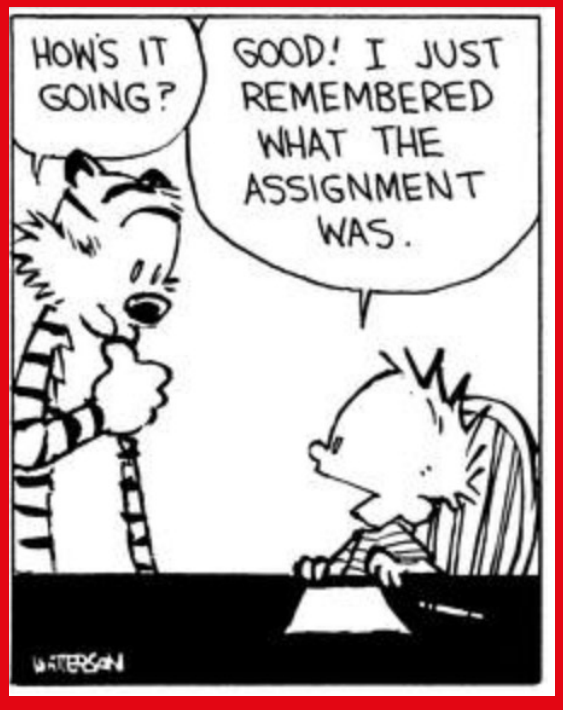
biosafety (Moodle)

- **presentation**
- **quiz**

finish Benchling exercises

See you soon!





Calvin & Hobbes
by Bill Waterson