PROFESSIONS-
HØJSKOLEN
ABSALON

"How to prepare for lab"

Majbrit Maden

Version 1 from 22. august 2023

Why do we prepare for lab?

- To know what to do
  - If there is a specific order to perform the experiment
  - If there is a specific technic to understand
  - If there is something to be aware of regarding safety
  - If there are anything to prepare (calculation, buffers, etc.)
  - If there are a specific thing to remember to note during the experiment
- To ensure safer and well executed experiments

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How to prepare for lab?

- Read the protocol/manual
  - Understand the purpose of the experiment, what are you aiming to prove/find?
  - Look up all the abbreviations or word you do not understand to ensure that you know them
- Make a flow diagram
  - To ensure that you understand the steps and orders and what to use
  - Helps you during the experiment to know what to do next
- Preparation prior to start the experiment
  - Prepare document to conduct the experiment
  - Prepare equations & calculations
  - How to obtain the needed concentration (how much to weight out)
  - What dilutions is needed (how to do the dilution)

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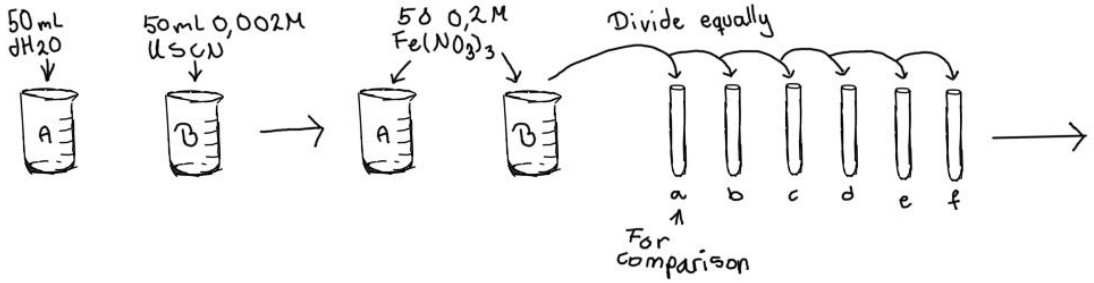
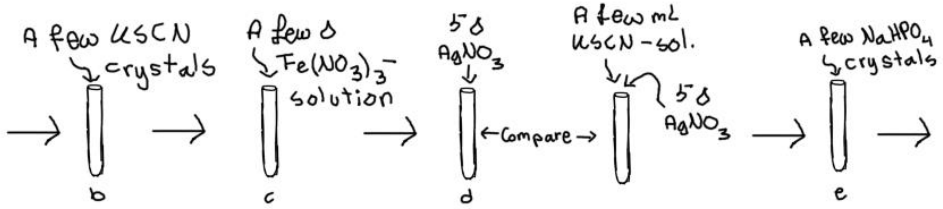
Example of flow diagram - 1

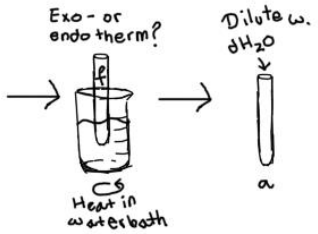
General and organic chemistry:
Equilibrium

Part 1:

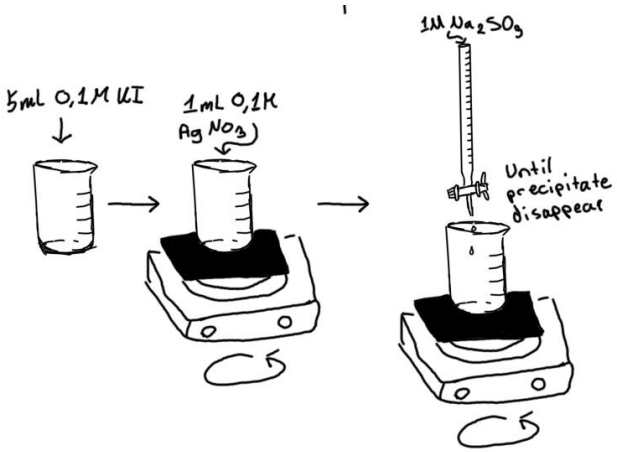




Example for scheme to document results:



Part 2:



Pt. 1

Test tube	Added *(compound/heat)*	Observations *(Colour/precipitate/exo- or endotherm)*	Equilibrium pushed towards
a			
b			
c			
d			
e			
f			

Pt. 2

0,100 M KI added (mL)	0,100 M $AgNO_3$ added (mL)	1,00M $Na_2S_2O_3$ added (mL)

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Angela Kristiansen

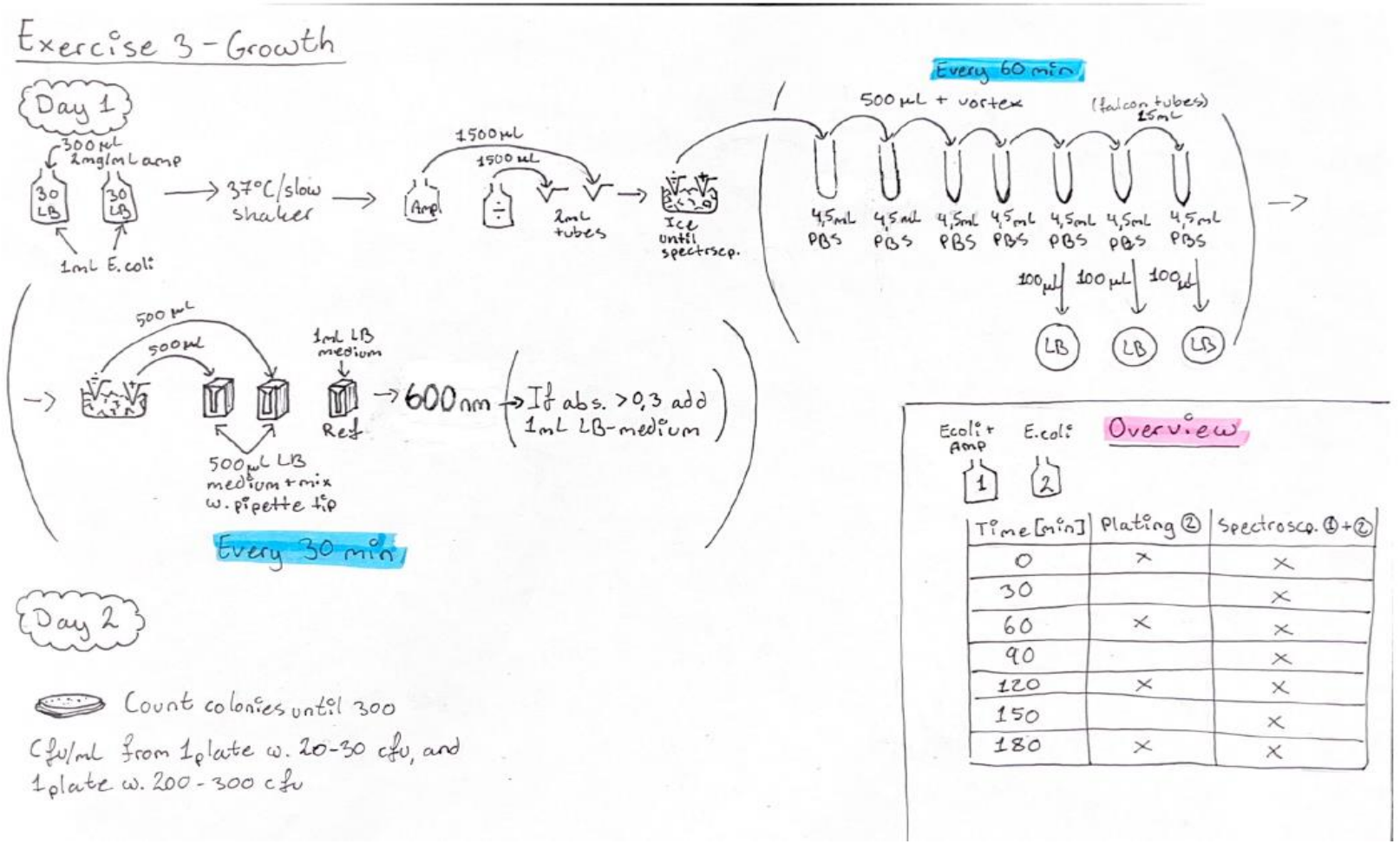
Example of flow diagram - 2

Microbiology:
Growth of E. coli measured by spectrophotometer & plate count

Prepared excel scheme to document the experiment Day 1. Including calculation of ln and plot with linear regression.
Results form spectrophotometer:

Time [Min]	E.Coli + AMP	E.Coli
0		
30		
60		
90		
120		
150		
180		

Materials:
Spectrophotometer type: _____
Incubator used: _____



Time [min]	Plating ②	Spectroscp. ①+②
0	x	x
30		x
60	x	x
90		x
120	x	x
150		x
180	x	x

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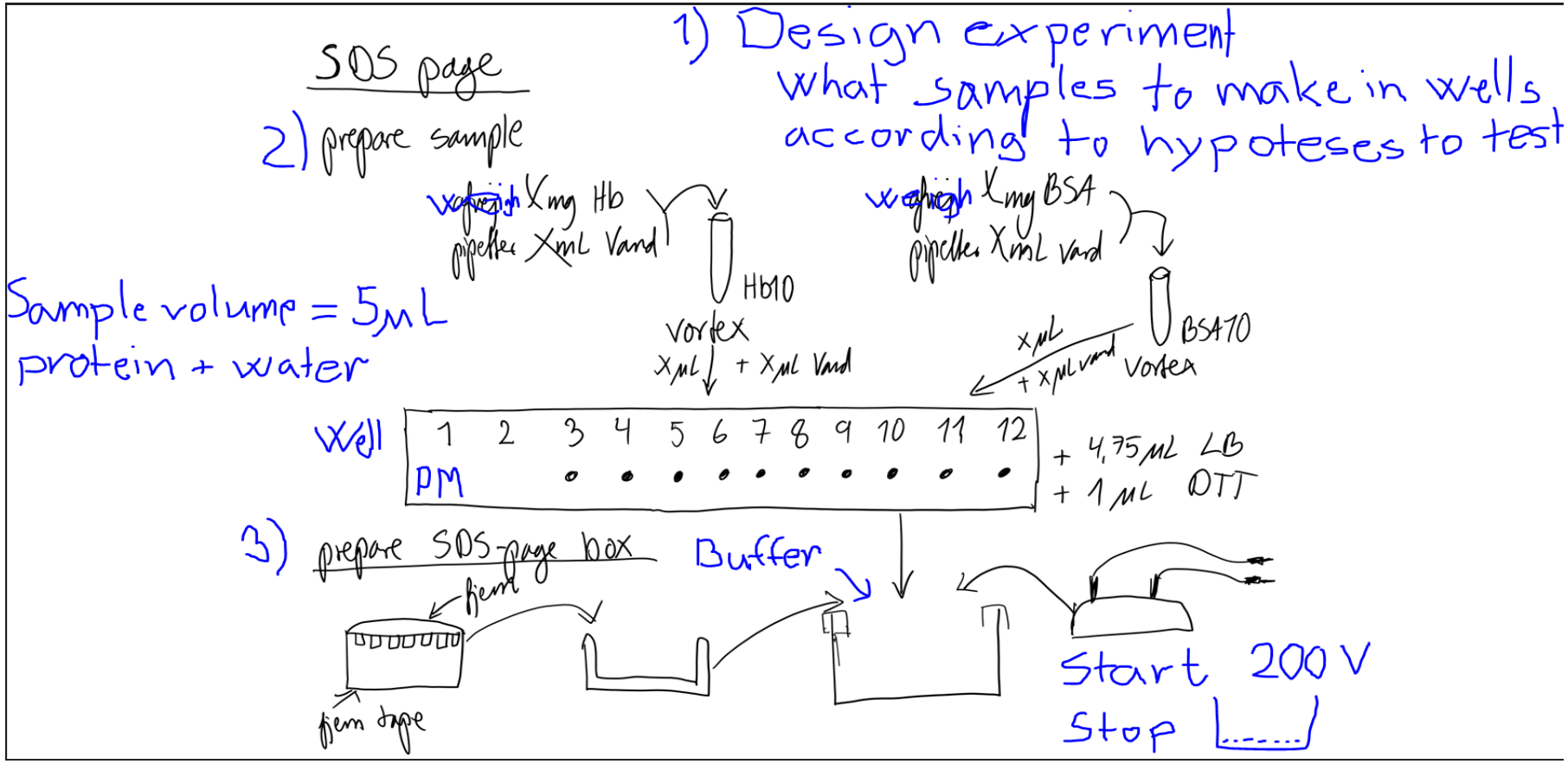
Angela Kristiansen & Majbrit Madsen

Example of flow diagram - 3

Biochemistry: SDS-page



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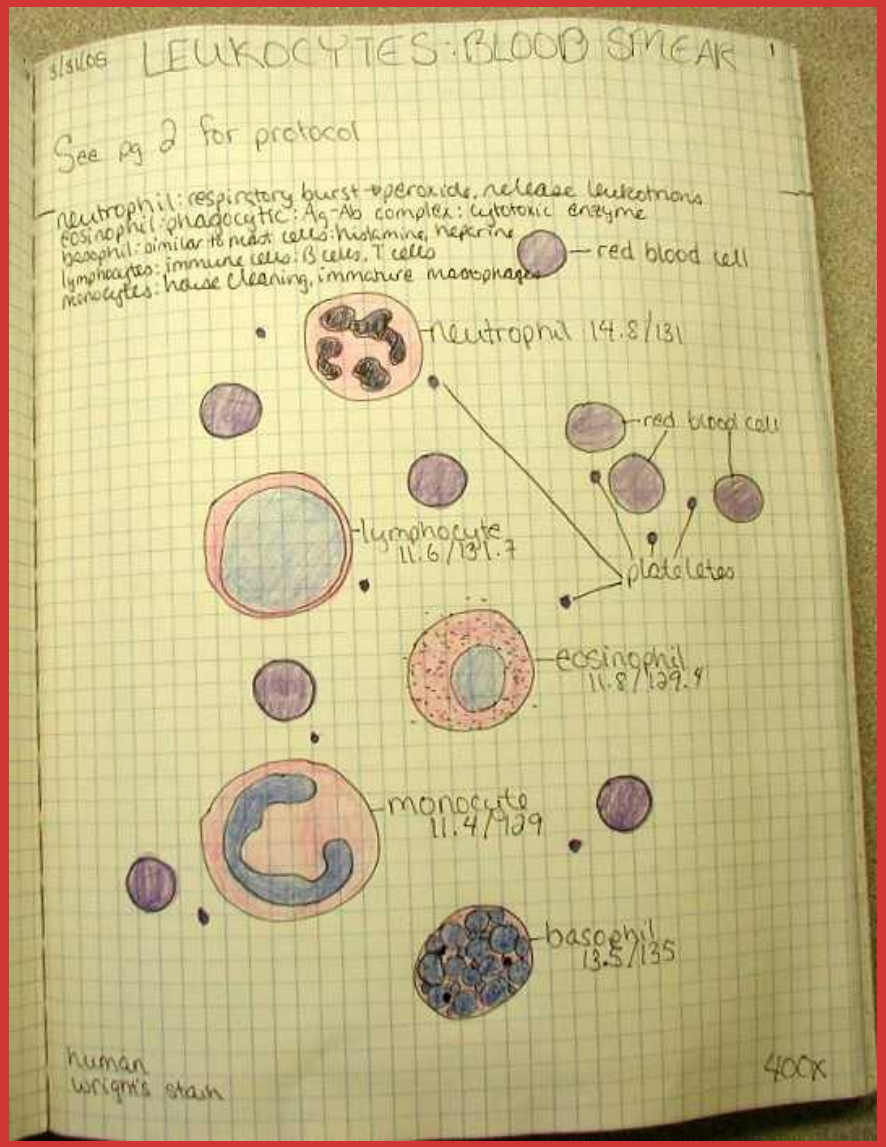
Majbrit Madsen

"How to labbook"

"How to avoid meaningless lab-work"

Kresten Jon Korup Kromphardt

Kim Blanksø Pedersen



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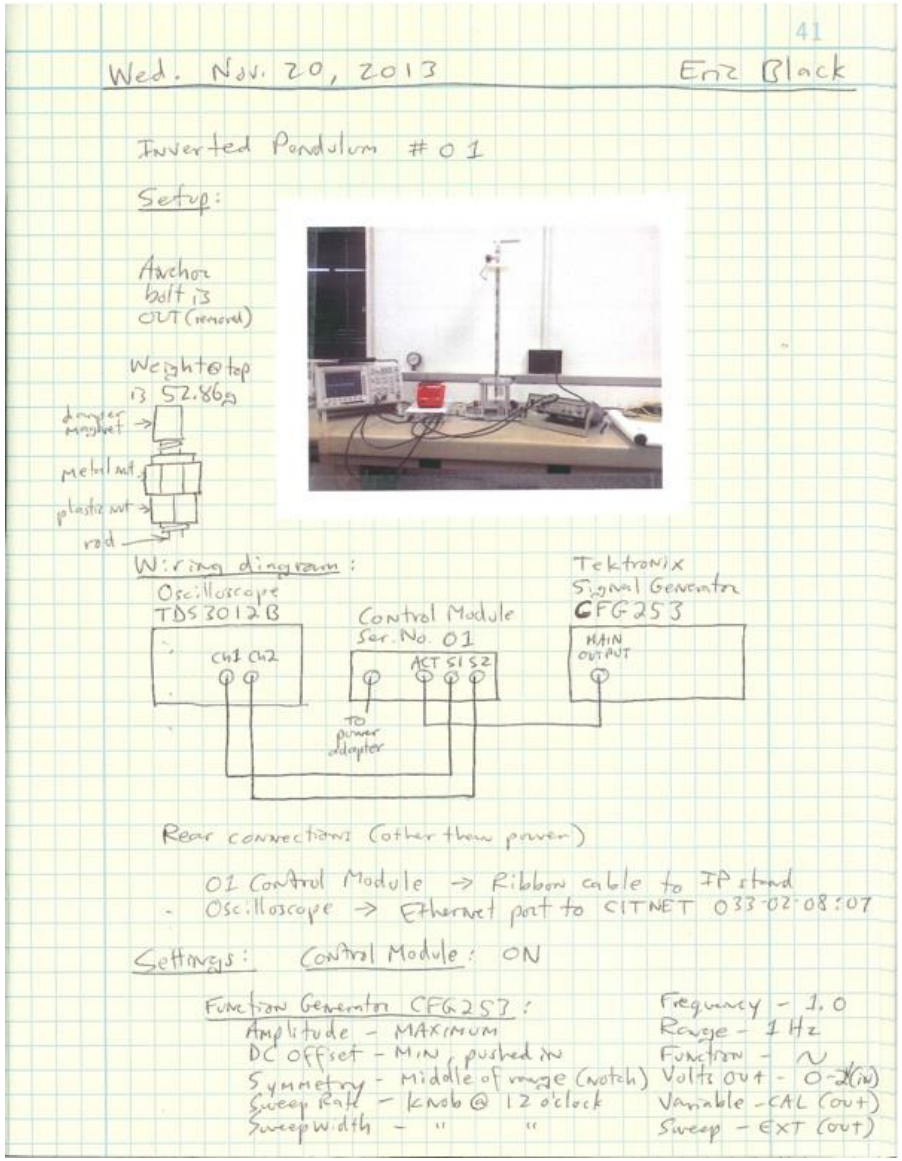
What is a Lab Book?



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Wed. Nov. 20, 2013 Eric Black

Inverted Pendulum #01

Setup:

Anchor bolt is OUT (removed)

Weight@top is 52.86g

Wiring diagram:

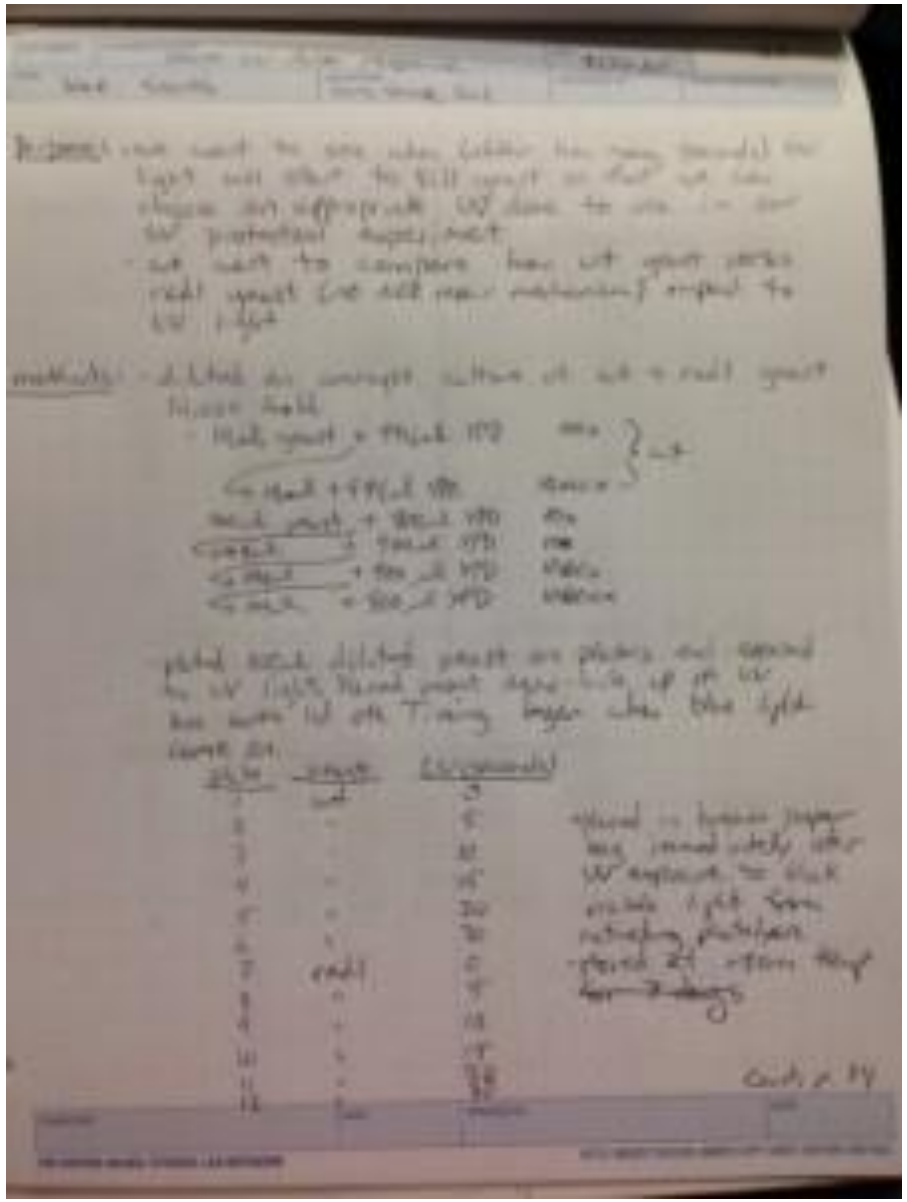
Rear connections: (other than power)

01 Control Module → Ribbon cable to IP stand
- Oscilloscope → Ethernet port to CITNET 033-02-08-07

Settings: Control Module: ON

Function Generator CFG253:
Amplitude - MAXIMUM
DC offset - MIN, pushed in
Symmetry - Middle of range (notch)
Sweep Rate - knob @ 12 o'clock
Sweep width - " "

Frequency - 1.0
Range - 1 Hz
Function - ∿
Volts out - 0-2(in)
Variable - CAL (out)
Sweep - EXT (out)



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Why do we keep lab notes?

- To document that we have actually done what we have done → patents / documentation for staying within standards (GxP)
- To remember what we have done
  - Troubleshooting is impossible without notes!
- So that others can repeat what we have done
- To be able to write a report in the end!!

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What to write?

- Date + operator(s)
- Overall tasks which have been/should be completed
- Keeping track of samples taken + storage of samples → Names of samples must be documented in lab books
  - Arbitrary numbers could be given to samples
- When documenting media formulation → write what you did not what the recipe said you should do!
- Write down mistakes → do not delete typos or remove pages
- What is the name of a datafile generated
  - Where is the datafile stored
- Safety →gloves, fume hood, goggles etc.
- Any special/hazardous waste

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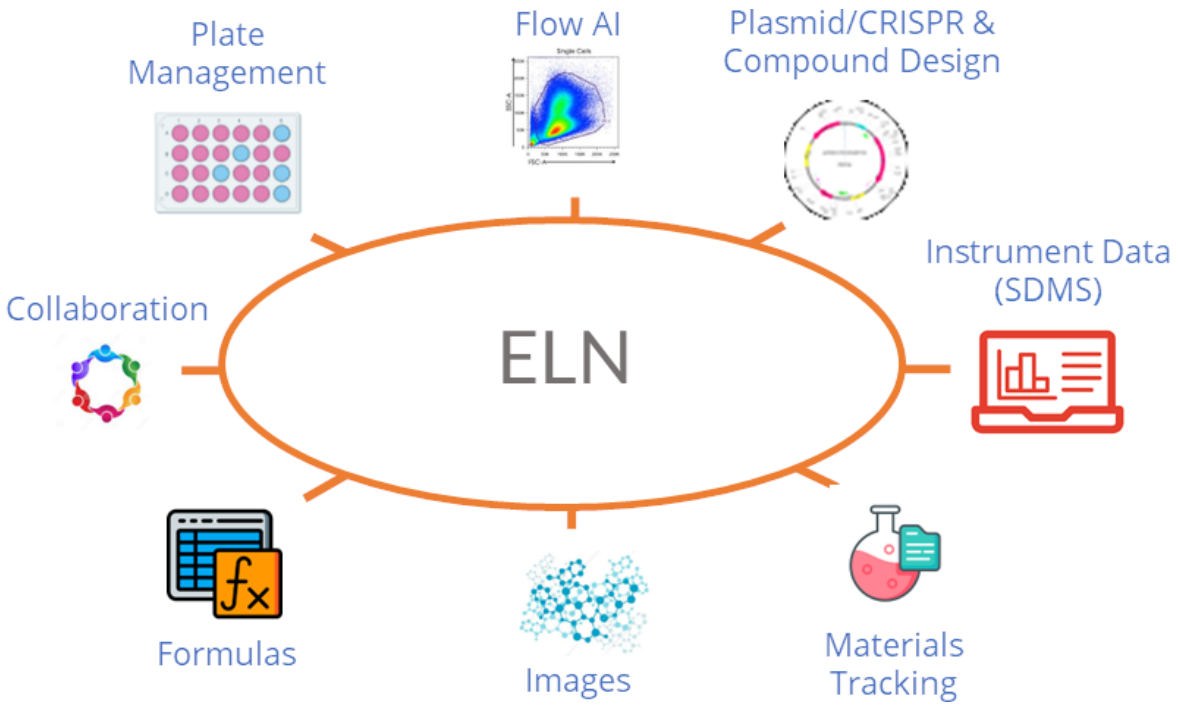
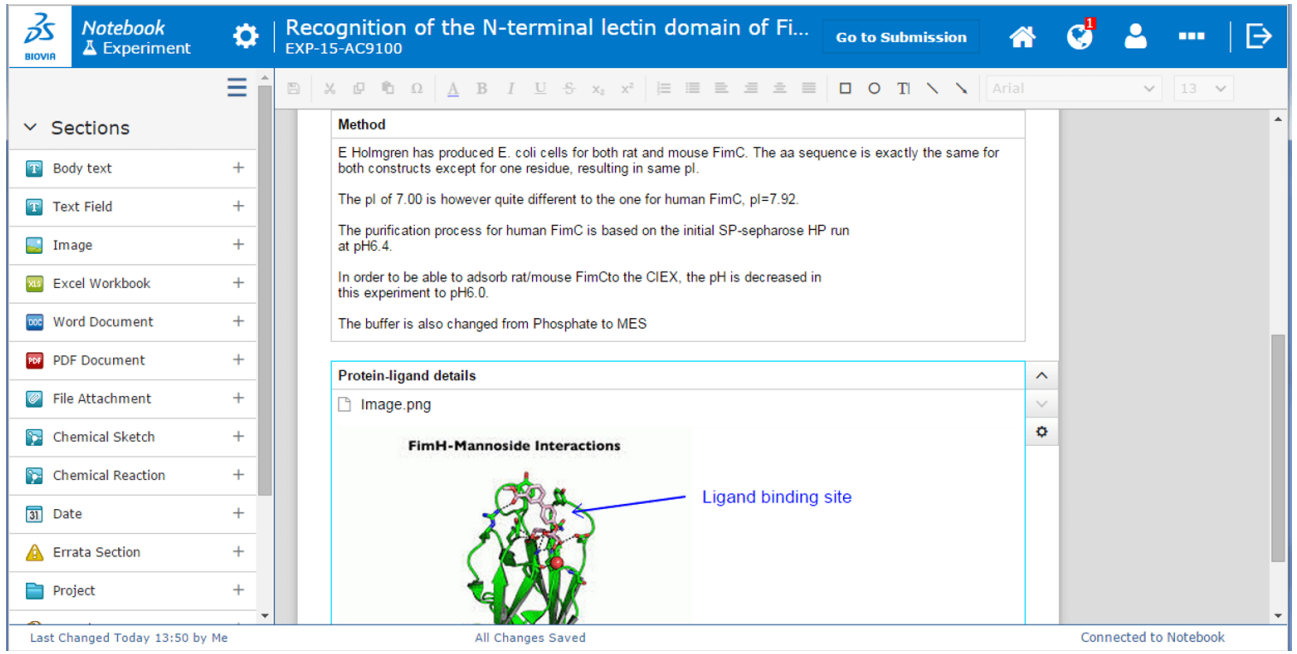
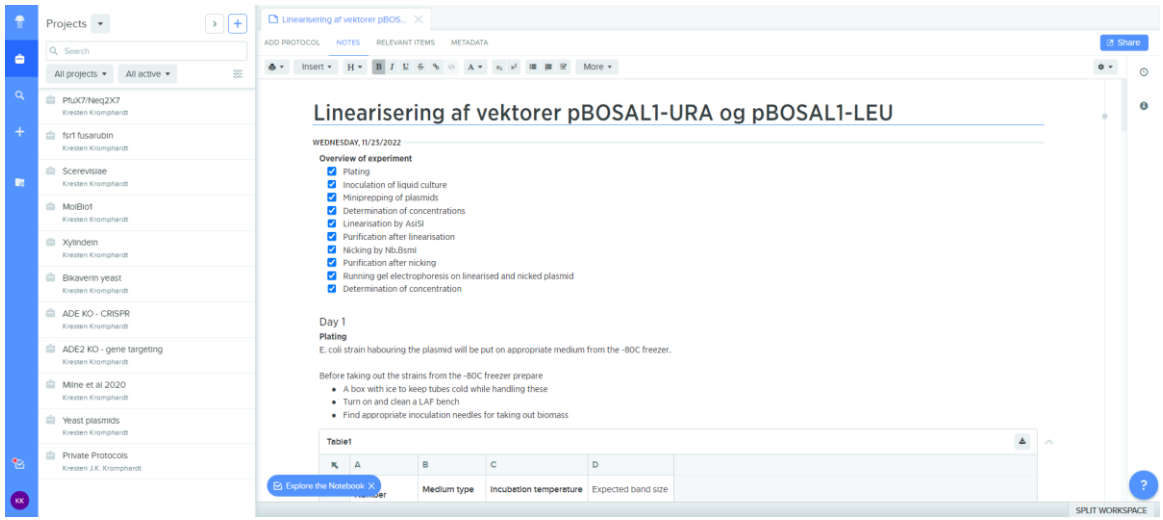
Electronic Lab Notebooks (ELN's)







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ELN vs. pen and paper

- ELN's are used extensively in regulated environments (pharma, biotech industry, clinical diagnostics etc.)

- Print instructions which you will be using multiple times → i.e., Lab manual

Find the right ELN for you: https://www.nature.com/articles/d41586-018-05895-3

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"How to do lab reports"

Majbrit Madsen

Version 1 from 22. august 2023

Why do we do lab reports?

- To document what we did and conclude on results and follow the IMR&D structure (introduction, methodology, results, discussion, and conclusion) with some additional elements.

- Report concept:
- https://docs.google.com/document/d/1FcAzA_sWch_9lo_IDAGArtTV5lxLFsqV/edit?amp;ouid=109174344958533626724&rtpof=true&sd=true

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Why do we do lab report review?

- To ensure professional output but avoid obvious mistakes

Input to Check list for review:

- Do it fit to the standard (sections, length, title data)
- Figures, tables and pictures
  - Consecutively numbering
  - Standalone explanation text
  - Reference in text to all
- References when stating facts
  - Check that all references are used in text
  - All references must be relevant, remember to refer to protocol
- Did we include what was required?
- Is there a conclusion on the results and perspectivation to literature if relevant?
- Is all theory relevant for this report?
- No new information in Discussion or Conclusion section
  - Relevant facts must be introduced in the Introduction section

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