

“How to prepare for lab”



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Version 1 from 22. august 2023

Why do we prepare for lab?

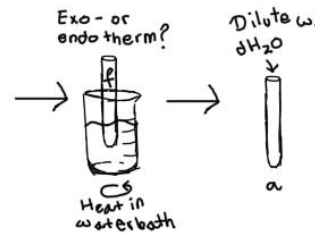
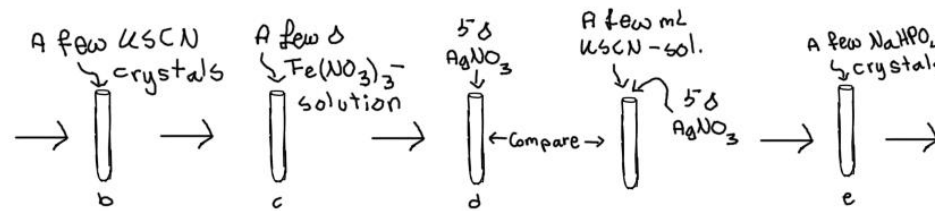
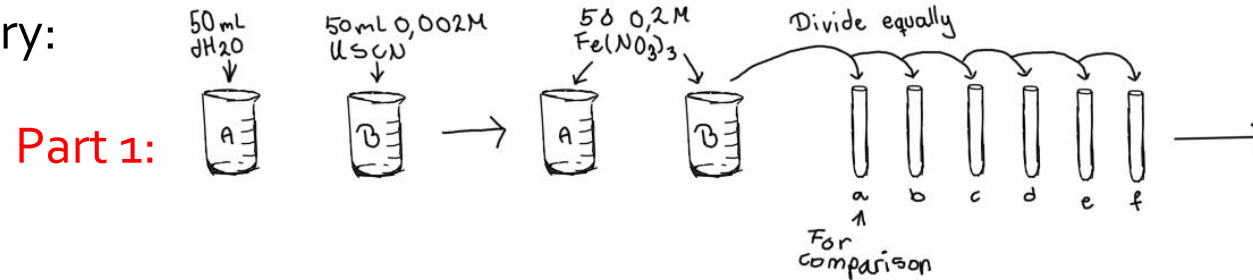
- To know what to do
 - If there is a specific order to perform the experiment
 - If there is a specific technic to understand
 - If there is something to be aware of regarding safety
 - If there are anything to prepare (calculation, buffers, etc.)
 - If there are a specific thing to remember to note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

How to prepare for lab?

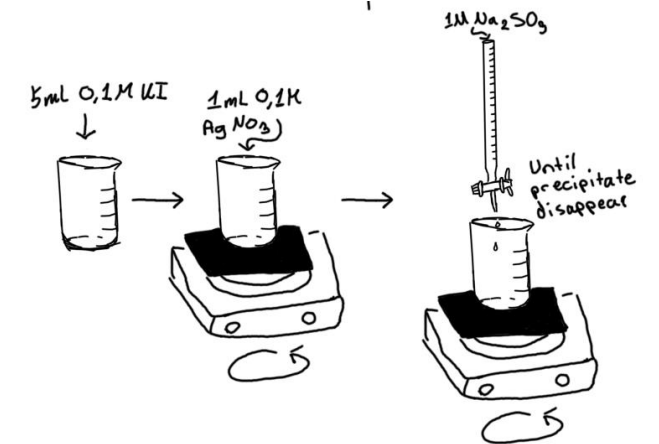
- Read the protocol/manual
 - Understand the purpose of the experiment, what are you aiming to prove/find?
 - Look up all the abbreviations or word you do not understand to ensure that you know them
- Make a flow diagram
 - To ensure that you understand the steps and orders and what to use
 - Helps you 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)

Example of flow diagram - 1

General and organic chemistry:
Equilibrium



Part 2:



Example for scheme to document results:

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 ₂ S ₂ O ₃ added (mL)

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 from spectrophotometer:

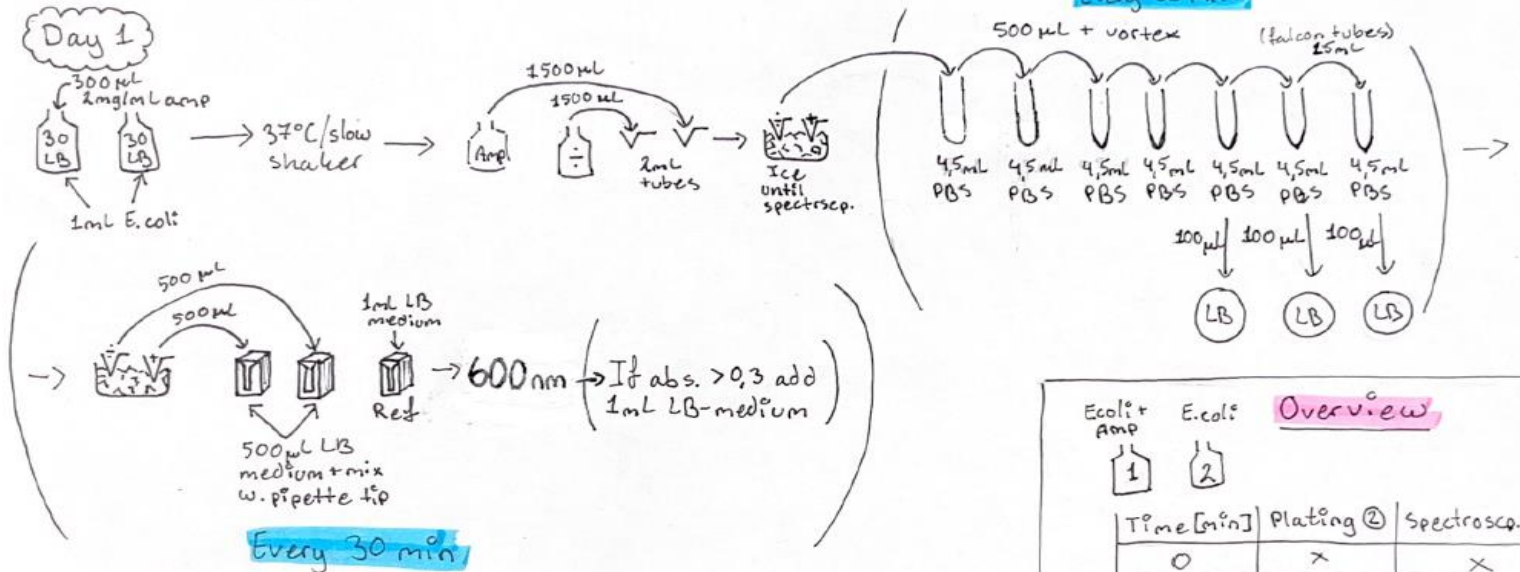
Time [Min]	E.Coli + AMP	E.Coli
0		
30		
60		
90		
120		
150		
180		

Materials:

Spectrophotometer type: _____

Incubator used: _____

Exercise 3 - Growth



Day 2

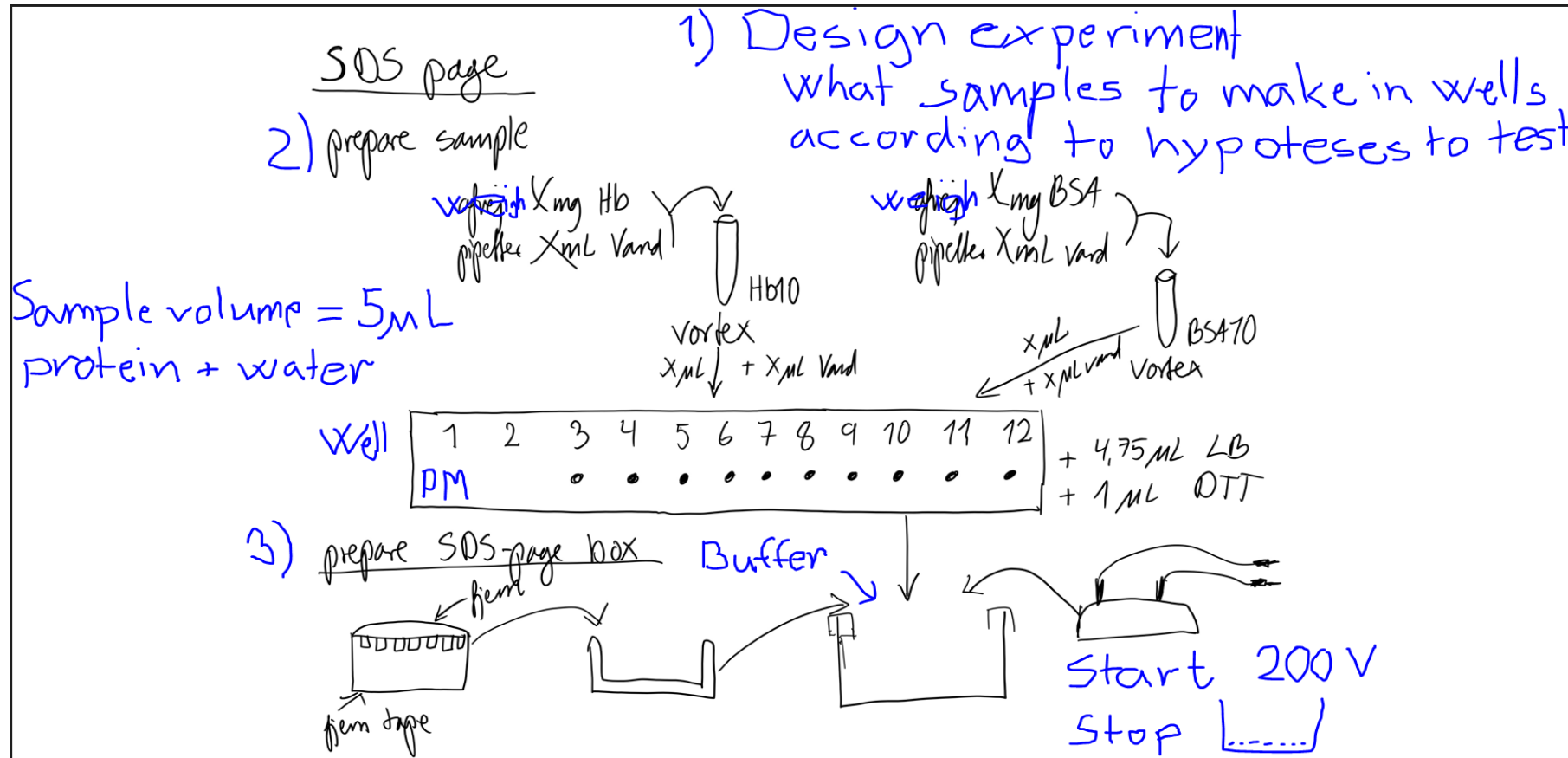
Count colonies until 300
cfu/ml from 1 plate w. 20-30 cfu, and
1 plate w. 200-300 cfu

Overview

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

Example of flow diagram - 3

Biochemistry: SDS-page

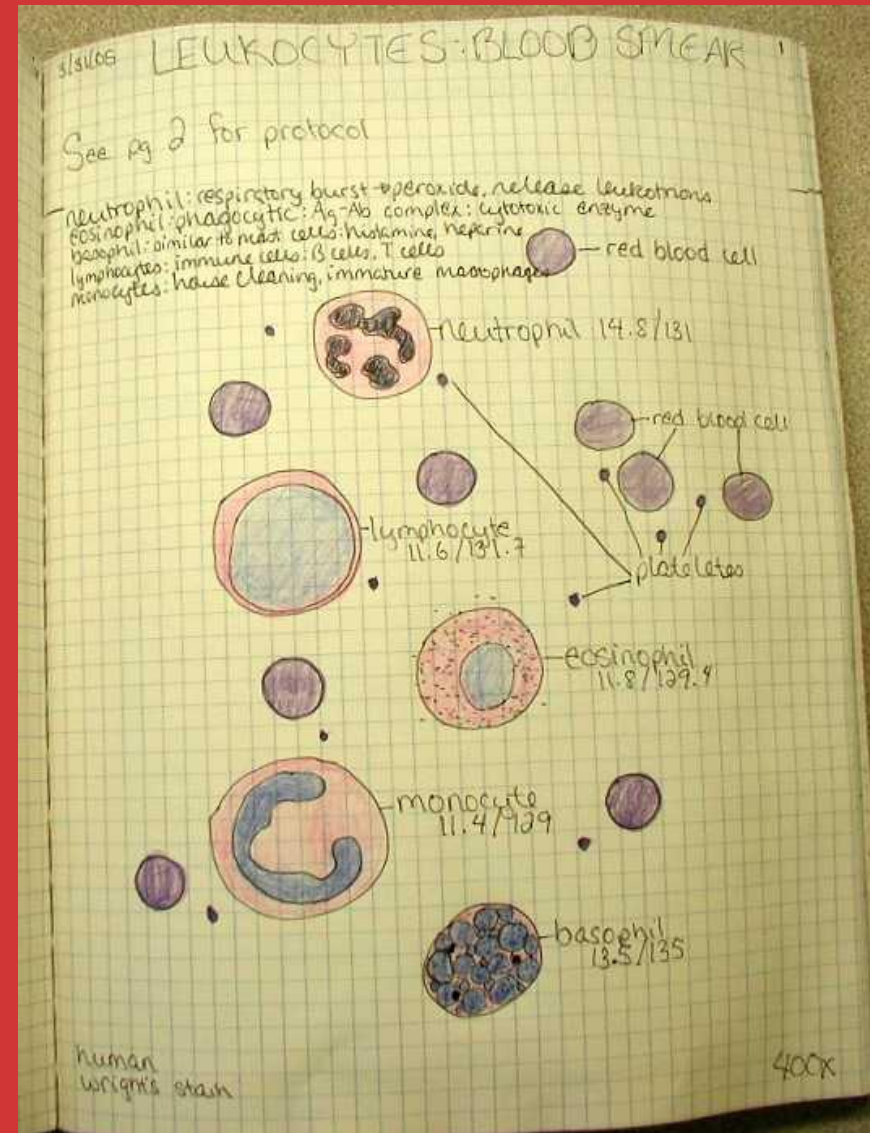


"How to labbook"

"How to avoid meaningless lab-work"

Kresten Jon Korup Kromphardt

Kim Blanksø Pedersen



Why do we keep lab notes?



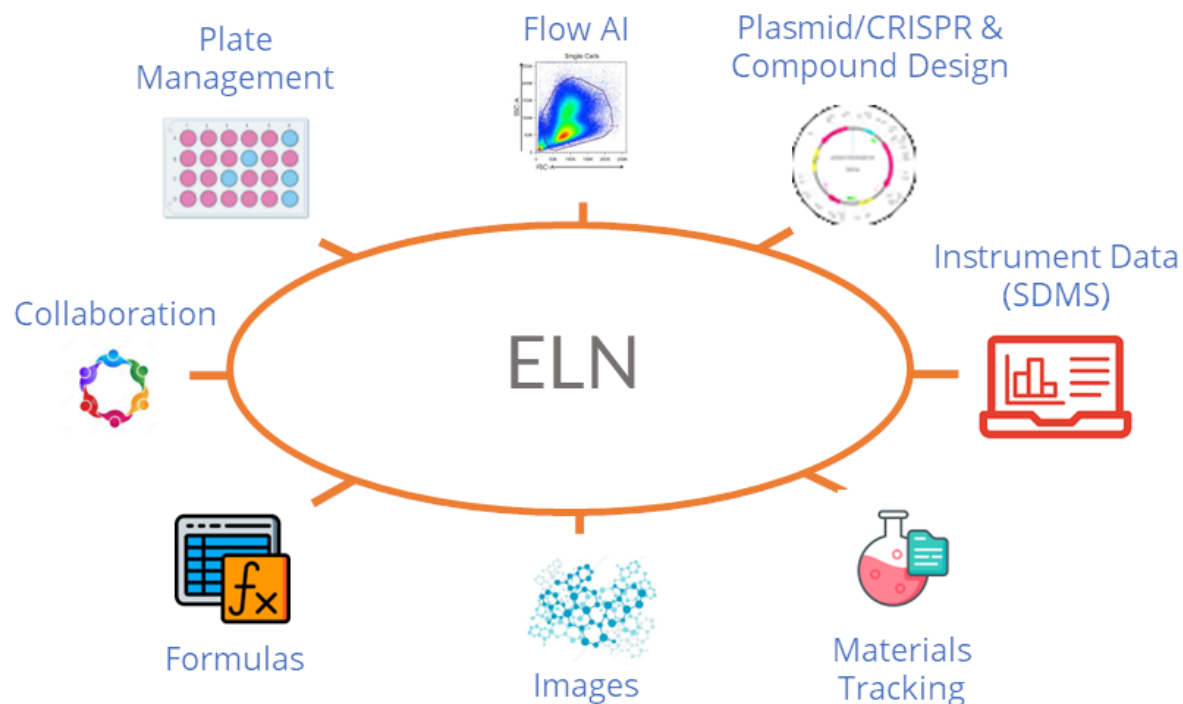
- To document that we have actually done what we have done → patents / documentation for staying within standards (GxP)
- To remember what we have done
 - Troubleshooting is impossible without notes!
- So that others can repeat what we have done
- To be able to write a report in the end!!

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

Electronic Lab Notebooks (ELN's)



The screenshot shows the BioVIA Notebook Experiment interface. The title bar indicates the experiment is "Recognition of the N-terminal lectin domain of FimC" (EXP-15-AC9100). The main content area is divided into sections:

- Method:** Contains text describing the production and purification of E. coli cells for rat and mouse FimC, including details about plasmid sequences and purification conditions (pH 7.00, SP-sepharose HP, pH 6.4, MES buffer).
- Protein-ligand details:** Includes an image of a 3D molecular model titled "FimH-Mannoside Interactions". A blue arrow points to a specific region labeled "Ligand binding site".

The interface also features a sidebar with various content types (Body text, Text Field, Image, Excel Workbook, Word Document, PDF Document, File Attachment, Chemical Sketch, Chemical Reaction, Date, Errata Section, Project) and a bottom status bar showing "Last Changed Today 13:50 by Me" and "All Changes Saved".

The screenshot displays a laboratory ELN interface for a project titled "Linearisering af vektorer pBOSAL1-URA og pBOSAL1-LEU". The interface includes a sidebar with project navigation, a main content area with a protocol overview, and a table for experimental conditions.

Overview of experiment

- Plating
- Inoculation of liquid culture
- Miniprep of plasmids
- Determination of concentrations
- Linearisation by AclI
- Purification after linearisation
- Nicking by Nt.BstNI
- Purification after nicking
- Running gel electrophoresis on linearised and nicked plasmid
- Determination of concentration

Day 1

Plating

E. coli strain harbouring the plasmid will be put on appropriate medium from the -80C freezer.

Before taking out the strains from the -80C freezer prepare

- A box with ice to keep tubes cold while handling these
- Turn on and clean a LAF bench
- Find appropriate inoculation needles for taking out biomass

Table1	A	B	C	D
Medium type				
Incubation temperature				
Expected band size				

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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>

“How to do lab reports”

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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_glo_IDAGArtTV5lxLFsqV/edit?amp;oid=109174344958533626724&rtfpo=true&sd=true

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