Managing your lab notebook

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Why is your notebook important?

- Reproducibility
- Legal document
- NSF data management plan
  - Sharing
  - Preservation

Table of contents

- First two pages
- Date, project page
- Electronic copy
- Print-out

Entry

- Date
  - recollections
- Project title or number
- Purpose (may be integrated in the title)

24 Sep 2016 Experiment 288

PCR of GFP-*ANIA00457* construct

Purpose: Transformation of *Arabidopsis* for localization studies

2 Oct 2034 Experiment 605 Results:
Testing inhibitor strength on eIF2

Continued from 1 Oct 2034, p. 35

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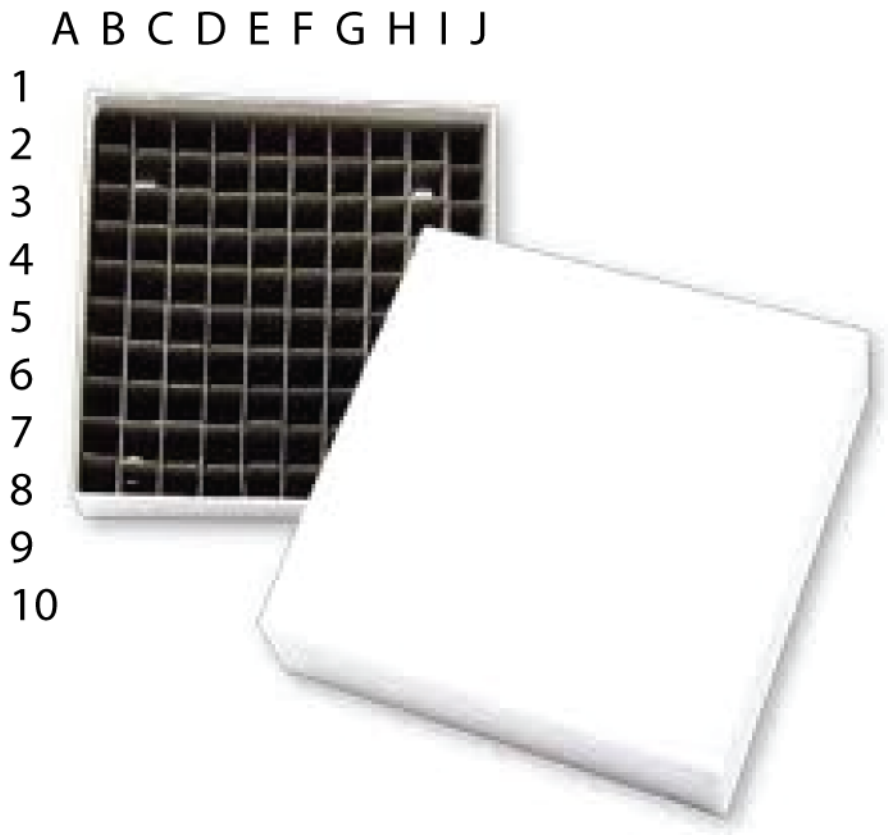
Continued on 4 Oct 2034, p. 42 MI

New protocol

- Buffers, strains, chemicals, solvents
- Lot numbers (very important for enzymes or high-purity compounds)
- Strain location
- Equipment calibrations
- Step-by-step procedure

Cataloging and referencing

- You may only have two strains now, but…
- Find out your lab standards
- Create a database now
  - Consistent naming and numbering
  - Details
  - Location (alpha-numeric grid)


A B C D E F G H I J
1
2
3
4
5
6
7
8
9
10

Examples of personal database entries

Strain/plasmid database

Box	Slot	Strain name	Parent strain	Genotype	Notes	Date	Source
1	32	MI5748	*E. coli*, *BL21*	*pET24, AN003653, T7 pro, ampR, lacI*	overexpression	05 June 2016	Invitrogen

Examples of personal database entries

Primer database

Box	Slot	Primer name	Sequence	Tm [C]	Purpose	Date
5	C6	yBABXhoIR	ATCTCGAGATCGATGCTAGCT	58	clone *yBAB* into pET28	12 Nov 2134

Examples of personal database entries

Article database

Year	Author	Title	Relevance to my work
2016	Isek Bases	The sequencing of the red kangaroo genome reveals a role for junk DNA	MadE82 binds Rad52 on GC-rich DNA

Old protocol

- Option I—the printout
  - Check lot numbers
  - Date in the upper margin
  - Mark each step and any deviations with a pen
  - Paste into the notebook, sign and date along the edge
- Option II—repeating an easy task for the n^{th} time

  EtOH precipitation as on 23 June 2190, p.90

Results

- Experiment name/date
- Observations
- Graphs, images and other output of digital data processing

Sample results

Data!

- Excel files
  - =CELL("filename")

C:\Users\Vessela\Desktop\[sample graph.xlsx]Sheet1

  - Write the formula used to process the raw data

c=A/ϵ*l, processed data [mM]=1000*raw data/6220
(NADH extinction coef. at 340 nm)=raw data/6.22

- Digital images
  - Print thumbnails
  - List folder/names—either make the names self explanatory, or add description in the notebook

Data!

- Hard copy images, chromatographs, microscope slides
  - Binder
  - Date each
  - Label with the experiment name and extend to give a unique ID
  - Reference in notebook with description

Exp. 349 Results (continued from 12/29/2104, p. 10)
Binder5/20140904/exp.349 image 1/HeLa stained with DAPI 350nm/461nm FV1000 Olympus 200xlens

Sequencing data

- Gene name
- Folder containing sequence file
- What was the purpose of sequencing
- Any differences with publicly available sequence?

ANID004376 in Sequences/20450405; sequenced after cloning to ensure PCR didn't introduce errors; no mutations found

Data mining

- Databases
- Key parameters in search
- Outcome

NCBI/biosystems

tyrosine biosynthesis/conserved domains

Hits: AAT_like ID: 99734,

CM_2: Chorismate_mutase type II ID: 201989,

CM_pl-yst: monofunctional_chorismate_mutase, eukaryotic type ID: 130861,

PheA ID: 31793

Sequence alignments

- Sequence ID
- Software
- Folder containing saved alignments
- Conclusions

Conclusions

- Did the experiment succeed, fail or was it inconclusive
- Will you repeat it? Will you change anything?
- Any new thoughts about the process and its implications?

Notebook activity

Read the narrative of a day in the lab and construct a notebook entry based on the information contained in it. If the details given are incomplete (they are), supply the missing piece.