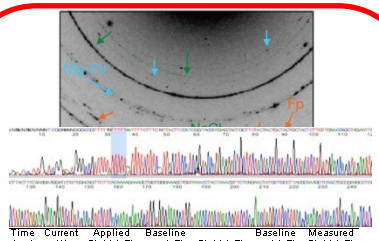
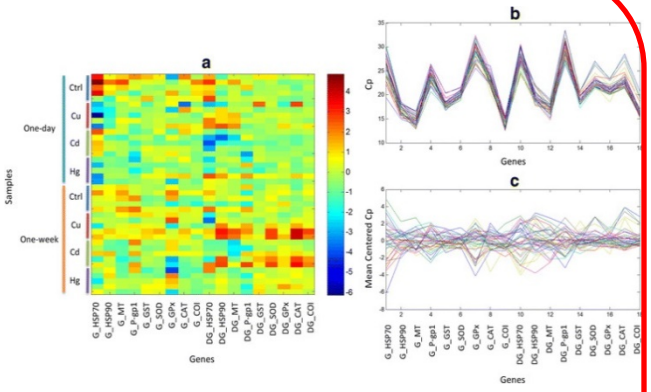
Rezultate – datele brute, rapoartele finale și arhivare

Experiment



Time (sec)	Current (A)	Applied Field (nT)	Baseline pre (uT)	Field (uT)	Baseline post (uT)	Measured Field (nT)
30	0.90	130.50	0.0388	-2.0076	-0.0357	-2009.1
90	0.10	14.50	-0.0357	-0.2000	0.0419	-203.1
150	0.40	58.00	0.0419	-0.8578	0.0268	-922.1
210	-0.60	-87.00	0.0268	1.4526	0.0926	1392.9
270	-0.50	-72.50	0.0926	1.2358	0.0957	1141.6
330	-0.70	-101.50	0.0957	1.6905	0.1212	1582.0
390	-0.20	-29.00	0.1212	0.5373	0.0719	440.8
450	-0.90	-130.50	0.0719	2.1278	0.1570	2013.3
510	0.80	116.00	0.1570	-1.7794	-0.0207	-1847.6
570	0.20	29.00	-0.0207	-0.4224	0.0434	-433.8
630	0.50	72.50	0.0434	-1.1109	0.0263	-1145.7
690	-0.80	-116.00	0.0263	1.9039	0.1260	1827.8
750	0.70	101.50	0.1260	-1.5755	-0.0009	-1638.0
810	0.60	87.00	-0.0009	-1.3533	0.0134	-1359.5
870	-0.30	-43.50	0.0134	0.7689	0.0692	727.6
930	-0.40	-58.00	0.0692	0.9912	0.0752	919.0
990	0.30	43.50	0.0752	-0.6579	0.0429	-718.9
1050	-0.10	-14.50	0.0429	0.2857	0.0585	235.0

Date brute



Date prelucrate
gata de publicare

Cum am procedat? Ce am obținut? Cum și ce concluzii am tras?

Toate detaliile trebuie înregistrate și păstrate pentru a se putea oricând răspunde la întrebările:

In ce consta experimentul? Cine l-a realizat? Cand? Cum a procedat?

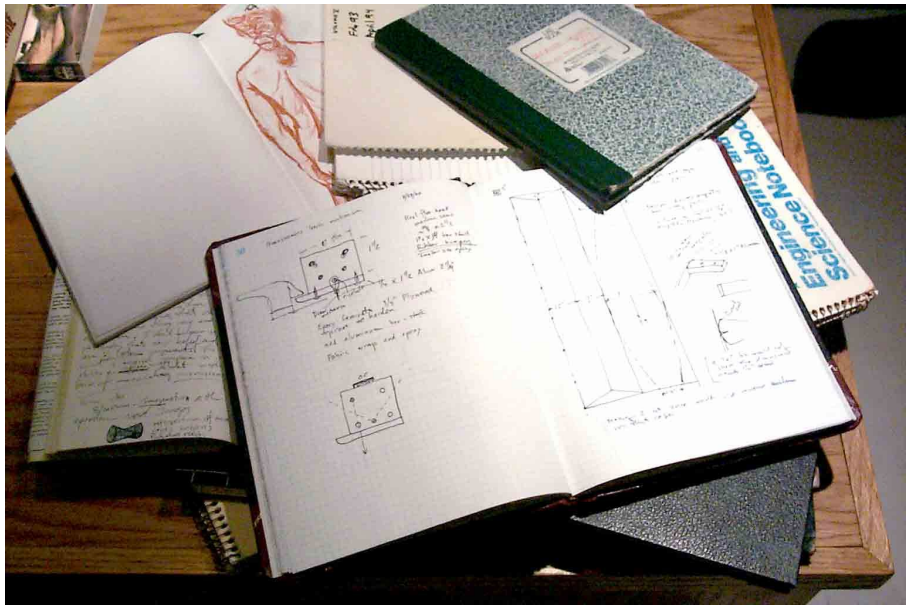
Pierderea înregistrărilor sau înregistrări incomplete pot anula validitatea unui studiu.

”researchers have a fundamental obligation to create and maintain an accurate, accessible, and permanent record of what they have done in sufficient detail for others to check and replicate their work.” On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. Washington

Înregistrarea datelor în caietul de laborator

Formatul caietului de laborator:

- Legat prin lipire sau coasere în așa fel încât paginile să nu poată fi înlocuite;
- Hârtie neutra, fără lignină, albă, netransparenta, cu o durata de viață de minim 50 ani;
- Paginile numerotate;
- Caietele se numerotează în ordinea completării lor (MM01, MM02,etc.)



Structura caietului de laborator:

- **Pagina titlu ce conține următoarele informații:**
  - Data la care s-a început și data la care s-a finalizat utilizarea respectivului caiet
  - Afilierea instituțională / laborator
  - Numele, adresa de e-mail și numărul de telefon al cercetătorului

- **Cuprins – realizat la final, după ce caietul a fost finalizat – lista experimentelor**

- **Intrări făcute cu cerneală sau extrase cu date tipărite (de la spectrofotometru)**

Inregistrarea completa a unui experiment

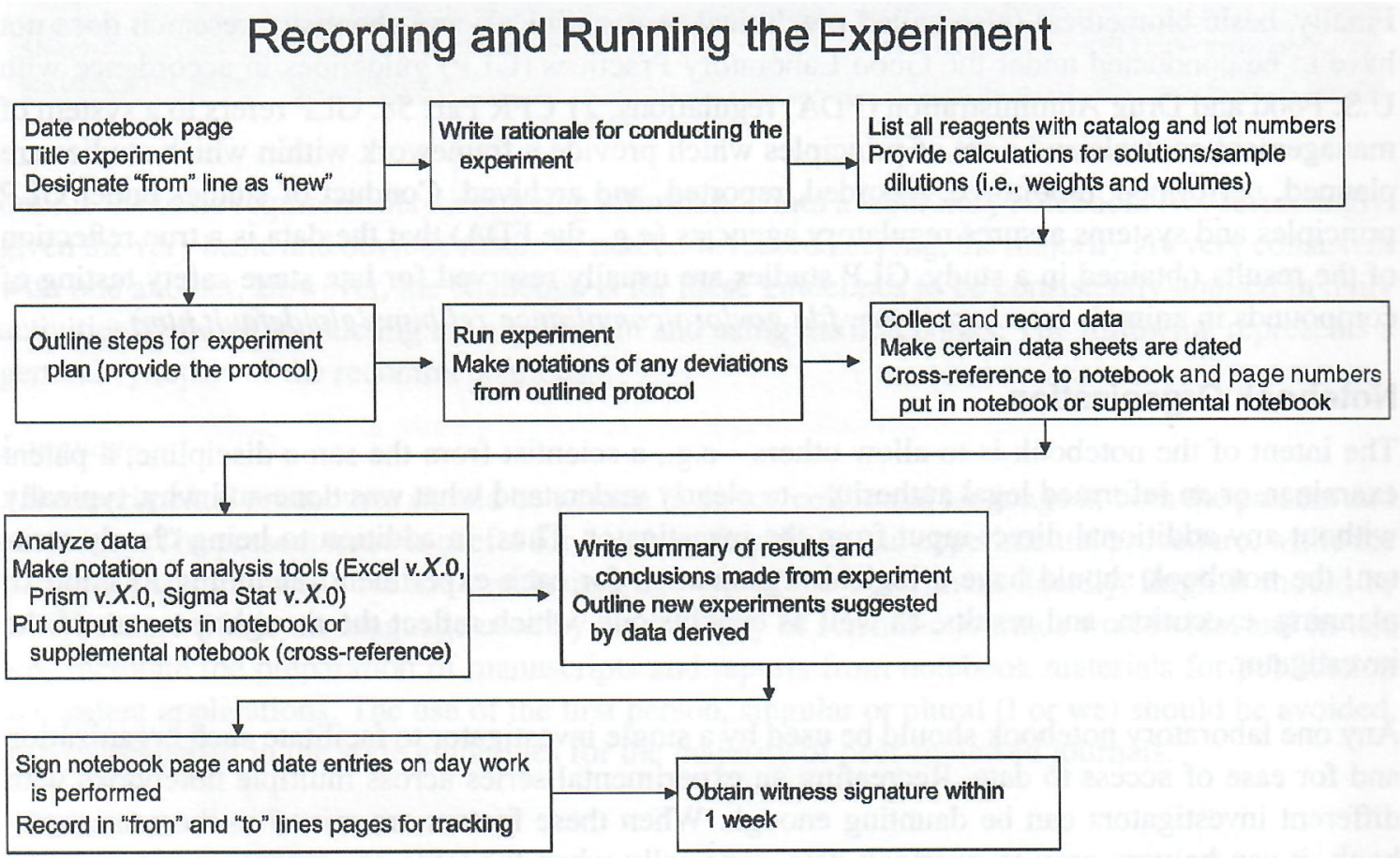


Figure A.2.3 Flow chart representing vital steps in recording and running the experiment.

Current Protocols Essential Laboratory Techniques *Laboratory Notebooks and Data Storage*

Page A.2.6

Exemple de pagini din caiete de laborator

LABORATORY NOTEBOOK 1448 Page 131 of 200

Date: 1-18-06

Title Binding of New Compounds to the Adenosine A_1 Receptor Labeled by [3H] JB007

(cont from pg. new)

Purpose: To repeat IC_{50} value on Cmpd A and assess activity of Cmpd B

Tissue: Rat brain synaptosomes (preparation on 11/17/05) see Notebook 1234 p 84

Reagents: Assay Buffer = 50 mM Tris Phosphate pH 7.4 (4°C)
Tris Sigma Trizma Phosphate (monobasic) cat# TB655
mol. wt = 219 1M = 219 g/L ; 50mM = 10.95 g/L
make 2L stock = 21.9 g/2L in ice cold deionized distilled water pH → 7.4 with HCL

Adenosine deaminase (ADA) Alco Biologicals cat# A-1065
130 International Units/mg ; Supplied as 250 Units/ml = 500 units/mL in glycerol buffer

[3H] JB007 Helvetica Radiosources (Geneva) cat# HZ-217
38 Ci/mmole stock = 27.2 μM
Run final conc. = 5nM
Require 10 x solution = 50 nM
stock 1/500 dilution = 54.4 nM ≈ 50nM
27.2 μM 1/100 = 272 nM 0.1ml in 10ml buffer
1/5 = 54.4 nM 1mL + 4mL buffer

Unlabelled non-specific
10 μM 2 chloroadenosine (Fluka 22997)
Mol. wt 301.7
100μM (1 in 10 dilution) initial
1 mM = 30g 3.0 mg/10mL then dilute 1 in 10
dissolve in buffer

(cont. on pg. 132)
Signature John Hancock Date 1-18-06
Countersignature Fred Nobel Date 1-25-06

Figure A.2.6 A page in a hypothetical notebook prepared by John Hancock and verified by Alfred Nobel.

LABORATORY NOTEBOOK 1448 Page 132 of 200

Date: 1-18-06

Title See page 131

(cont. from pg. 131)

Compounds Resynthesis
Cmpd A - made 11/15/05 - see D. Triggle Notebook 1743 p 25
Cmpd B - synthesis 12/12/05 - H Gschwend Notebook 1530 p 230

Cmpd A mol. wt = 386
Previous IC_{50} = 9.7 nM Notebook 1234 p 160
Six Five concentrations : 300, 100, 30, 10, 3
300 nM = 3 μM initial (1 in 10 dilution in assay)

1 μM = 386 ug/L 3 μM = 1.16 mg/L

make 1 mM = 3.86 mg/10mL weigh 3.86 mg
dissolve in 0.2mL DMSO dilute with buffer

1 mM 1 in 10 = 100 μM = 1mL + 9mL buffer
1 mL + 9 mL buffer = 10 μM
0.3 mL → 1 mL = 3 μM

3 μM stock stock = 1 in 10 of stock 1mM = 100 μM
→ 1 in 10 → 10 μM.
0.3 → 1 mL = 3 μM = A-1 soln

(cont. on pg. 133)
Signature John Hancock Date 1-18-06
Countersignature Fred Nobel Date 1-25-06

Figure A.2.7 A page in a hypothetical notebook prepared by John Hancock and verified by Alfred Nobel.

Exemple de pagini din caiete de laborator

LABORATORY NOTEBOOK 1448 Page 135 of 200

Title

(cont. from pg. 134)

Set up tubes as follows:

Tubes	[^{32}P]JB007	2-chloroadenosine	Buffer	Cmpd.	Tissue
1-3	0.1	-	0.1	-	0.8
4-6		0.1	-	-	
7-9		-	-	0.1 A1	
*10-12		-	-	0.1 A2	
13-15		-	-	0.1 A3	
16-18		-	-	0.1 A4	
19-21		-	-	0.1 A5	
22-24		-	-	0.1 A6	
25-27		-	-	0.1 B1	
28-30		-	-	0.1 B2	
31-33		-	-	0.1 B3	
34-36		-	-	0.1 B4	
37-39		-	-	0.1 B5	
40-42		-	-	0.1 B6	
43-45		-	-	0.1 C1	
46-48		-	-	0.1 C2	
49-51		-	-	0.1 C3	
52-54		-	-	0.1 C4	
55-57		-	-	0.1 C5	
58-60		-	-	0.1 C6	
61-63		-	0.1	-	
64-66		0.1	-	-	

*note: tube # 11 received 2x amount of tissue

(cont. on pg. 136)

Signature John Hancock Date 1-18-06

Countersignature Alfred Nobel Date 1-25-06

Figure A.2.10 A page in a hypothetical notebook prepared by John Hancock and verified by Alfred Nobel.

LABORATORY NOTEBOOK 1448 Page 138 of 200

Title

(cont. from pg. 137)

Excel Calculations JH 1-19-06

		cpm/replicate			Mean	(-BKG)			Mean	STD	SEM	%CV	% total
Total		3607	2804	2913	3008.5	3128.5	2325.5	2434.5	2528.0	325.9	133.0	12.9	100.0
non-specific		2741	2830	3144		2262.5	2351.5	2665.5					
		429	513	546	478.5	-49.5	34.5	67.5	0.0	58.1	23.7		0.0
		390	487	606		-88.5	8.5	27.5					
Cmpd A	300	815	788	840		336.5	319.5	381.5	684.5	21.1	12.2	3.1	27.1
	100	1120	2307	1098		641.5	1828.5	619.5	947.2	691.8	399.4	73.0	37.5
	30	1347	1292	1390		868.5	813.5	911.5	1014.5	49.1	28.4	4.8	40.1
	10	1641	1690	1696		1162.5	1211.5	1119.5	1513.7	45.0	26.0	3.0	59.9
	3	2404	2380	2240		1925.5	1901.5	1761.5	2177.8	88.6	51.1	4.1	86.1
	1	3109	2889	2946		2830.5	2380.5	2467.5	2492.8	126.9	73.3	5.1	98.6
Cmpd B	1000	860	720	690		381.5	241.5	211.5	480.3	90.7	52.4	18.9	19.0
	300	1206	1157	1120		727.5	676.5	641.5	944.7	43.1	24.9	4.6	37.4
	100	1701	1684	1871		1222.5	1205.5	1192.5	1401.8	19.0	8.7	1.1	55.5
	30	2109	2067	2020		1630.5	1618.5	1541.5	2025.5	48.3	27.9	2.4	80.1
	10	2700	2916	3162		2221.5	2437.5	2703.5	2481.2	241.4	139.4	9.7	98.1
	3	2965	3150	2945		2386.5	2671.5	2466.5	2508.2	147.0	84.9	5.9	99.2
* control	30	513	540	560		34.5	61.5	81.5	181.5	23.8	13.6	13.0	7.2
2-chloroadenosine	10	812	790	745		333.5	311.5	266.5	426.2	34.2	19.7	8.0	16.9
	3	1918	1078	987		539.5	597.5	508.5	894.2	45.2	26.1	5.1	35.4
	1	1600	1790	1765		1121.5	1311.5	1286.5	1474.8	103.2	59.6	7.0	58.3
	0.3	2251	2068	2246		1772.5	1589.5	1767.5	2012.0	104.2	60.2	5.2	79.6
	0.1	2560	2643	2975		2081.5	2364.5	2496.5	2314.2	212.0	122.4	9.2	90.7

Entries in Prism GraphPad JH 1-19-06

	X Values	A			B			C		
	Conc. (nM)	control			Cmpd A			Cmpd B		
	X	A:Y1	A:Y2	A:Y3	B:Y1	B:Y2	B:Y3	C:Y1	C:Y2	C:Y3
1	0.01									
2	0.03									
3	0.10	2081.5	2364.5	2496.5						
4	0.30	1772.5	1589.5	1767.5						
5	1.00	1121.5	1311.5	1286.5	2630.5	2380.5	2467.5			
6	3.00	539.5	597.5	508.5	1925.5	1901.5	1761.5	2386.5	2671.5	2466.5
7	10.00	333.5	311.5	266.5	1162.5	1211.5	1119.5	2221.5	2437.5	2703.5
8	30.00	34.5	61.5	81.5	868.5	813.5	911.5	1222.5	1205.5	1192.5
9	100.00				641.5		619.5	1630.5	1618.5	1541.5
10	300.00				335.5	319.5	361.5	727.5	678.5	641.5
11	1000.00							381.5	241.5	211.5

Data Transform X = Log x for non-linear regression analysis

(cont. on pg 139)

Signature John Hancock Date 1-19-06

Countersignature Alfred Nobel Date 1-25-06

Figure A.2.13 A page in a hypothetical notebook prepared by John Hancock and verified by Alfred Nobel.

Exemple de pagini din caiete de laborator

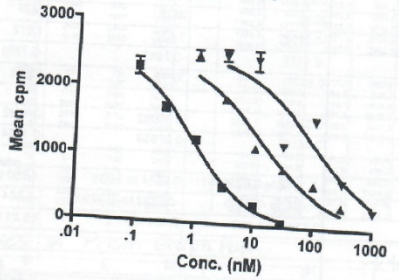
LABORATORY NOTEBOOK 1448 Page 140 of 200

Title

(cont. from pg. 139)

Competitive Binding Inhibition
IC_{50} values

1-19-06



Results: Positive Control (2-chloroadenosine) IC_{50} = 0.85nM

Compound A IC_{50} = 12.8nM

Compound B IC_{50} = 93.8nM

Specific binding for assay 3006.5 - 478.5 cpm
= = good signal to noise

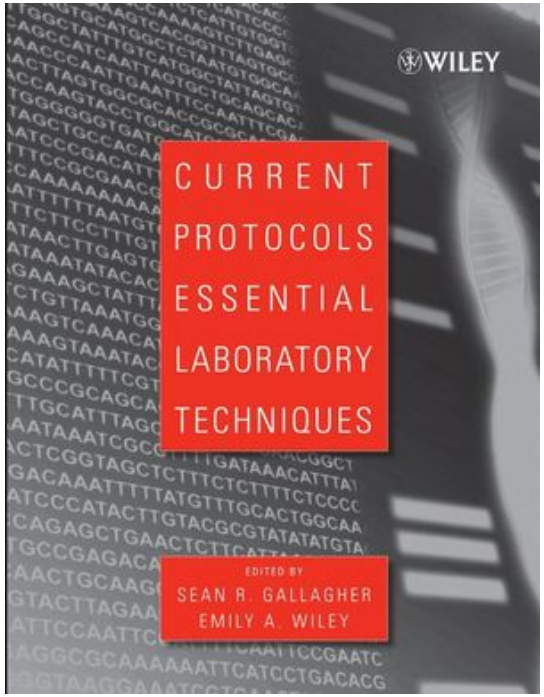
Conclusions: IC_{50} for Compound A in good agreement with previous value of 9.7nM (Notebook 1234 p.160)
Compound B = less active than Compound A - need to repeat to see if SAR is developing at the A_1 receptor

(cont. on pg.)

Signature John Hancock Date 1-19-06

Countersignature Alfred Nobel Date 1-25-06

Figure A.2.15 A page in a hypothetical notebook prepared by John Hancock and verified by Alfred Nobel.



Electronic laboratory notebook - ELN

https://bioactive-storage.mynetgear.com/login.php

https://eurekalabbook.com/

TOOLBOX

LAB NOTEBOOKS GO DIGITAL

A burgeoning array of digital tools is helping researchers to document experiments with ease.

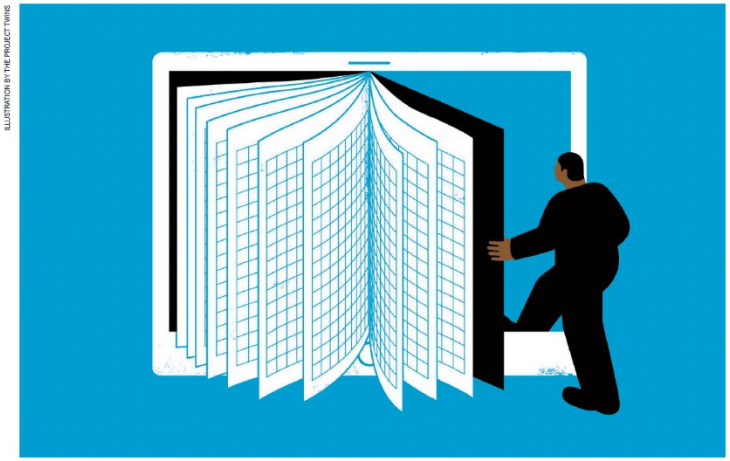


ILLUSTRATION BY THE PROJECT TWINS

BY ROBERTA KWOK

Since at least the 1990s, articles on technology have predicted the imminent, widespread adoption of electronic laboratory notebooks (ELNs) by researchers. It has yet to happen — but more and more scientists are taking the plunge.

One barrier to uptake is the wide range of products available. ELNs comprise software that helps researchers to document experiments, and that often has features such as protocol templates, collaboration tools, support for electronic signatures and the ability to manage the lab inventory. But the ELN market encompasses considerable variety; a study conducted in 2016 by the University of Southampton, UK, identified 72 active products (S. Kanza *et al. J. Cheminformatics* **9**, 31; 2017). "It's just insane," says Sian Jones, a petroleum engineer at the Delft University of Technology in the Netherlands. "It does become very confusing." And many researchers simply lack the time or motivation to make the move to ELNs.

But today's early-career researchers, who have grown up with digital technology, tend to expect — and to embrace — electronic solutions. Recent trends in research have also created a demand for such changes: as scientists deal with increasing volumes of data, gluing printed results into a paper notebook becomes more archaic. Concerns over reproducibility, as well as more stringent requirements on data management from funding agencies, have motivated improvements in the documentation of lab work. And the ELN market has expanded to include more intuitive tools, such as cloud-based products, which are easier to adopt than those requiring information technology (IT) support to install. "I do feel that we're approaching a tipping point," says Alastair Downie, head of IT at the Gurdon Institute at the University of Cambridge, UK.

ELN developers say that they have also seen signs of growing interest. Where researchers once questioned the utility of ELNs, now they are quicker to commit, says Simon Bungers, co-founder of labfolder, an ELN company in Berlin. Benchling, an electronic research platform in San Francisco, California, has seen use of its ELN in academia more than double for the past two years, with tens of thousands of researchers now logging in every day, says chief executive Sajith Wickramasekara. ▸