Project Management in the Lab

2021 CBR-SBME Summer Studentship Program

Handout content developed by Deb Chen, PhD, 2017

What is project management?

- Getting things done in accordance with a set of acceptance criteria

What does project management look like in your Summer Studentship?

- What is your main project objective (i.e., project aim)?
- What are your specific deliverables? (e.g., lab meeting presentations, final report, others)
    - How could each milestone be broken down into even smaller tasks (e.g., literature review, consulting with your supervisor, perform experiment, analyze results)?

=== Try it out! Schedule your project tasks in your calendar for the remainder of your studentship ===

What are some considerations when planning and monitoring your progress?

- Build in extra time to complete tasks to allow for revisions and unexpected situations
- Schedule regular meeting time with your supervisor
- Create to-do lists
- Use a laboratory notebook

What is a laboratory notebook?

- Living LEGAL document, owned by your supervisor or institution
- Daily record of every experiment you do, think of doing, or plan to do
- Daily record of your thoughts about each experiment and the results
- Basis of every paper and thesis you write (and your final report at the end of the summer!)
- Someone else "skilled in the art" would be able to decipher what you did and how you performed the experiments (to pick up where you left off or reproduce your results)

What goes into a laboratory notebook?

- A detailed account of *every* planned and executed experiment with the amount of detail that would enable another scientist to determine:
    - **When it was done** – dates accompanying every entry, account, or record
    - **How it was done** – detailed protocols, reagents, lot numbers in each entry; when appropriate, use sketches or diagrams to clarify
    - **Why was it done** – explanations of the significance and rationale of each experiment
    - **The results** – your observations, interpretation of results, and conclusion of the experiment
        - Photos and other inserts should be placed securely in your notebook so they don't come loose
        - Include information about where the electronically captured data files are stored
        - Include all data, even from failed experiments or contradictory experiments

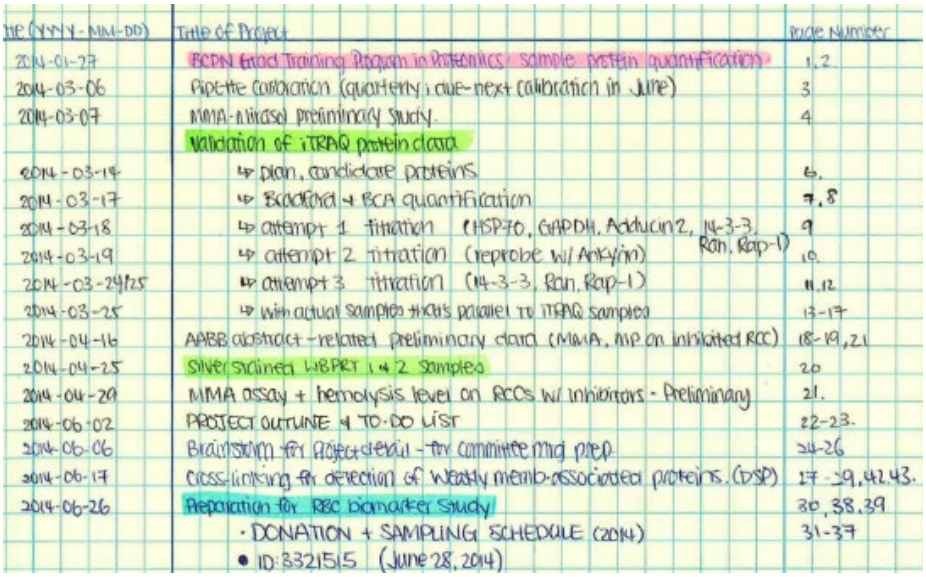
Time saving tips and tricks:

- Keep a Table of Contents – increase ease of looking up previous experiments and protocols
- Cross Reference (e.g., If starting a new experiment on page 48 using the same protocol described on page 22, write on page 48, "*following the same protocol as described on page 22 of this laboratory notebook*.")
- Pre-printed forms – helpful for common, standard procedures

=== Try it out! See if you can find the answers to the following questions in your laboratory notebook ===

- Why was the experiment done?
- What was the experimental plan and rationale behind your approach?
- How was the experiment executed? Do you have enough information to repeat the experiment?
- What strategies might you take with you to help improve your lab notebook for the future?

Examples:



Date (YYYY-MM-DD)	Title of Project	Page Number
2014-01-27	RCPN Grad Training Program in Proteomics: sample protein quantification	1,2
2014-03-06	Pipette calibration (quarterly; due next calibration in June)	3
2014-03-07	MMA-kinase preliminary study	4
	Validation of iTRAQ protein data	
2014-03-14	↳ plan, candidate proteins	6
2014-03-17	↳ Bradford + BCA quantification	7,8
2014-03-18	↳ attempt 1 titration (HSP70, GAPDH, Adducin2, 14-3-3 Rdn, Rap-1)	9
2014-03-19	↳ attempt 2 titration (reprobe w/ Ankyrin)	10
2014-03-24/25	↳ attempt 3 titration (14-3-3, Rdn, Rap-1)	11,12
2014-03-25	↳ with actual samples + Kids patient to iTRAQ samples	13-17
2014-04-16	AABB abstract-related preliminary data (MMA, MP on inhibited RCC)	18-19,21
2014-04-25	Silver stained WB PET 1 + 2 samples	20
2014-04-29	MMA assay + hemolysis level on RCCs w/ inhibitors - Preliminary	21
2014-06-02	PROJECT OUTLINE + TO-DO LIST	22-23
2014-06-06	Brainstorm for project detail - for committee mtg prep	24-26
2014-06-17	Cross-linking for detection of weakly memb-associated proteins (DSP)	27-29,42,43
2014-06-26	Preparation for RBC biomarker study	30,38,39
	• DONATION + SAMPLING SCHEDULE (2014)	31-37
	• ID: 3321515 (June 28, 2014)	

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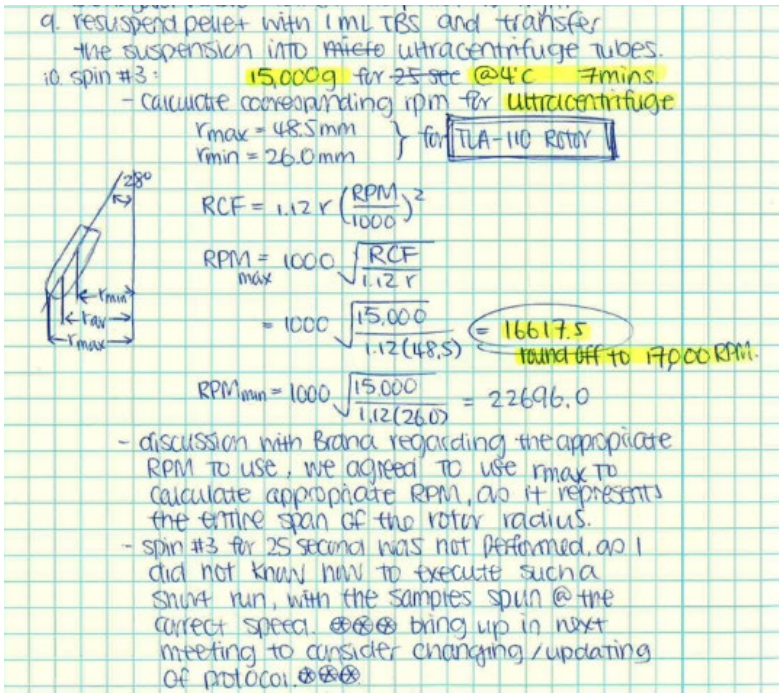

9. resuspend pellet with 1 mL TBS and transfer the suspension into ultracentrifuge tubes.
10. spin #3: 15,000g for 25 sec @4°C 7mins.
- calculate corresponding rpm for ultracentrifuge
r_{max} = 48.5mm, r_{min} = 26.0mm } for TLA-110 Rotor

28°

$RCF = 1.12\,r\left(\frac{RPM}{1000}\right)^2$

$RPM_{max} = 1000\sqrt{\frac{RCF}{1.12\,r}}$

$= 1000\sqrt{\frac{15,000}{1.12(48.5)}} = 16617.5$ found off to 17000 RPM.

$RPM_{min} = 1000\sqrt{\frac{15,000}{1.12(26.0)}} = 22696.0$

- discussion with Brana regarding the appropriate RPM to use, we agreed to use r_{max} to calculate appropriate RPM, as it represents the entire span of the rotor radius.
- spin #3 for 25 second was not performed, as I did not know how to execute such a short run, with the samples spun @ the correct speed. ⊗⊗⊗ bring up in next meeting to consider changing/updating of protocol ⊗⊗⊗

Protocol Development

Additional information:

http://www.ruf.rice.edu/~bioslabs/tools/notebook/notebook.html

http://www.iphandbook.org/handbook/ch08/p02/