Reading and Writing Scientific Research
BCDB Professionalization Workshop
Feb. 1, 2013

1. Strategies for keeping up with the literature:

A. Tools:
1. Field Specific
- Pubcrawler - NCBI emails of specified word search results
- MyNCBI - similar to Pubcrawler
- Table of Contents (ToC) e-mails from top journals/field journals
2. Breadth of Knowledge
- Cell Press – Active Zone
- Faculty of 1000 – mini-reviews of papers
3. Organizational software
- Papers (Macs)
- Endnote (PCs and Macs)
- Quosa (PC)

B. Habits:
- Regular routines of searching the lit and reading papers
  Examples: Read at night, at breakfast, off and on during the day, or schedule aside time specifically each day/week to read
- Advised to read 2-3 papers thoroughly or 3-5 papers skimmed per week
- Read the top 6 journals or from 3-4 topics of interest outside your field – keeps your breadth of knowledge up to date
- Attend conferences/seminars
- Read reviews (for senior students – write a review)

2. Strategies for reading a paper:

These strategies provided by random sampling of faculty members:

A. Abstract – skim paper – read in depth if pertinent or important
B. Discussion (what's the main point of paper) – Figures/Results (do the data convincingly back up their conclusions) – write a summary of what you just read
C. Intro (skim)–glance at methods–Figures/Results–Discussion (in depth)
D. Figures only – formulate own conclusions – Abstract – Discussion – if have questions, go back and read Results

3. Strategies for writing a paper:

A. Begin writing with either the abstract or an outline of the figures/story. Provides a framework for paper.

B. Introduction: Should be literature that relates to your subject, not a general overview of your field (Inverse triangle approach).
C. Materials and Methods: Can be written as you produce the data. Once a data set is complete, you can begin writing the method for data.
D. Figures: Make the figures as you go along, helps you to see what experiments still need to be done and potential holes in your story.
- Legends: Should explain everything in the figure on its own while minimizing repetition of what's written in Results.
E. Results: Don't review lit or past papers, include very little interpretation (save the interpretations for the discussion).
F. Discussion: Begin with the exciting and novel part of your paper. Then put it in the context of the literature, implications and future directions. Beware of too much model building verses a tough, critical analysis of the results.

Considerations when writing your paper:
- appeals to a large audience
- journal's readership/requirements
- relate your work to larger biological terms
- best to use Photoshop and Illustrator for making figures
- student should write the first draft
- have someone outside your field read it before sending it out
- Just do it!

4. Strategies for long-term retention:

A. Put many faces to the paper.
B. Write/draw models of the paper as you're reading.
C. Skim the paper or read abstract/discussion first, prior to reading it in depth.
D. Cultivate a passion and excitement for reading science. Emotional responses contribute to long-term retention.
E. Write a summary of the paper immediately after you've read it (without looking back at it).
F. Stay focused while reading and take notes. Engaged reading.
G. Maintain an "Ideas notebook".