**Module 2 Activity: Case-Based Questions**

**Read the teaching case: “Regeneration of Functional Heart Tissue in Rats”:** [**http://library.umassmed.edu/necdmc/research\_cases**](http://library.umassmed.edu/necdmc/research_cases) **and answer the questions below.**

1.) The research case on stem cells highlights common issues regarding the management of laboratory (lab) notebooks. The NIH requires that record keeping meet certain standards, and it reserves the legal right to audit and examine your lab notebooks as well as any recorded data that are relevant to any research grant award. However, lab notebooks also are important for more reasons than NIH accountability. In a small group brainstorm some additional purposes for maintaining a paper or e-lab notebook.

2.) The NIH provides a set of guidelines that covers the types of information that you should record in a lab notebook. In your group make a list of the project information that you feel should be recorded inside a lab notebook.

3.) How do you think the information should be recorded in a paper notebook?

4.) How do you think mistakes should be handled?

5.) What are some ways that electronic lab notebooks (ELNs) could assist you with data management?

6.) What are some storage and long-term preservation considerations for paper-based lab notebooks?

7.) What are some storage and long-term preservation considerations for ELNs?

8.) How long do you think lab notebooks should be retained?

9.) What kind of regulations or situations can you think of that could impact how long lab notebooks should be retained?

10.) Who owns the laboratory notebook? Who owns the lab notebook in a federally-sponsored study?

11.) Processing and Tracking Specimens Slides

*“We generate about 200 slides per rat heart. At any time, some tissue that was sectioned and on slides may be in one freezer, and some tissue that had not been sectioned yet but was embedded and ready to be sectioned is in another; and still other tissue that may be sitting in a container someplace in another freezer. It should be entered into the excel spreadsheet saying what was done and where it is, but that doesn’t always happen…” Dr. Glenn Gaudette*

A. The team has issues tracking the stages of specimens throughout the course of an experiment. What suggestions could you make to help the research team better track the stages of their specimens?

*“Even that – the location of where they are stored is a problem. We have the usual places where we store things but we have 3 or 4 freezers and if it is not in 1, we look in 2, and so on. The slide box is labeled with the experiment number and the individual slides are labeled with the slide number & experiment number”.*

B. The team has to waste a lot of time looking through freezers to locate specimens. What kind of workflows or technologies could you suggest to better document and track specimen locations?

12.) Tracking Microscopy Images

This project generates a large number of microscopy image files. What kinds of technologies exist to track and manage microscopy images?

13.) Linking the data

*“Multiple research staff may be analyzing the same heart, and one person will be doing the mechanical function of the heart, one will be doing the trichrome staining, another will be doing the actin staining and maybe another will be doing the imaging. The data sets should all be linked in the spreadsheet. There could easily be up to 10 people involved in data analysis, and we have not yet found a good way to link all the data.” Dr. Glenn Gaudette*

The team needs a way to add their data to a common file. What kind of workflows or technologies could you suggest would help these multiple team members edit and add to a common document?

14.) Managing and Preserving Paper Lab Notebooks

*“The content of a lab book relates to a particular experiment and is used by all staff working on that experiment. There is a format they are all supposed to follow, which they don’t always do. There could be on average 5-6 people using the notebook. The paper lab notebook basically performs the function of being an index into the actual datasets and it should record all the information the PI specifies. We also have a paper surgical log that is kept with the animal and whatever project staff writes down in that surgical log should be transferred into the lab notebook – so it has to be in 2 places. It has to be down there in case there is a problem with the animal, but the PI also needs it in the lab notebook to be able to write papers. The older lab notebooks are in the PI’s office, but the ones that are currently in use are in the lab. Older Lab notebooks are only in the PI’s office of lab with no backup.”*

What are some strategies, workflows and/or technologies that you could suggest to help this team manage and preserve their lab notebook and surgical logs?

15. This study produces a large number of data files such as microscopy images. What file naming conventions and folder structures would you suggest students in the lab use for labeling and storing their data files since students are often working on analyzing data from different aspects of the same heart tissue collected during the same experiment?

16. Students also have to label their slides and link these to the data analysis and image files. What kinds of information do you think students should record on these slides?

References:

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