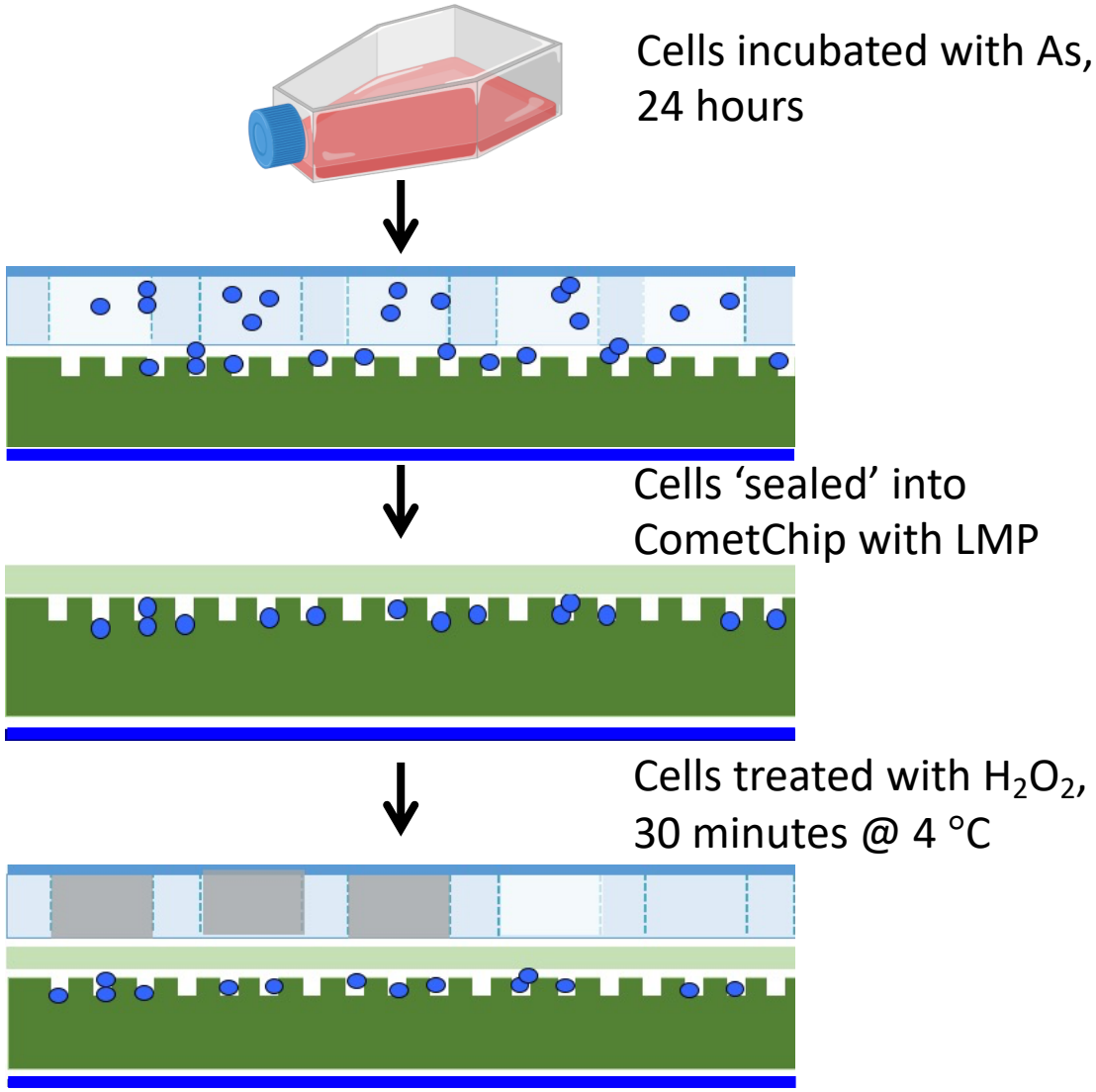
M1D6:
Image and analyze high-throughput genome damage assay

1. Prelab discussion
2. CometChip data analysis
3. Data summary prep!

Due dates are coming soon!

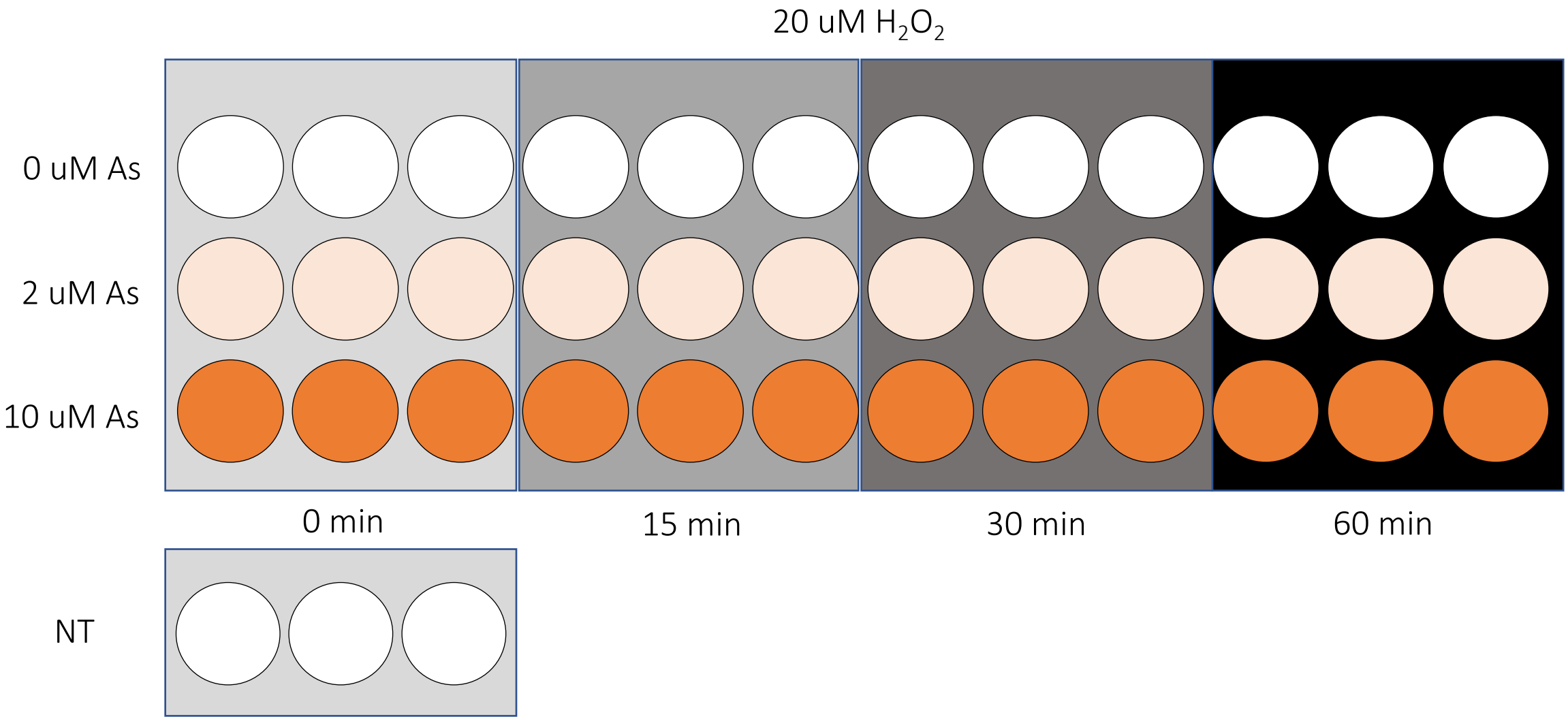
- Data summary (15%)
  - completed in teams and submitted via Stellar
  - draft due 10/4, final revision due 10/14
- Mini-presentation (5%)
  - completed individually and submitted via Gmail
  - due 10/11
- Laboratory quizzes (collectively 5%)
  - scheduled for M1D4 and M1D7
- Notebook (collectively 5%)
  - one entry will be graded by Aimee 24 hr after M1D7
- Blog (part of 5% Participation)
  - due 10/5 via Blogspot

Let's review…

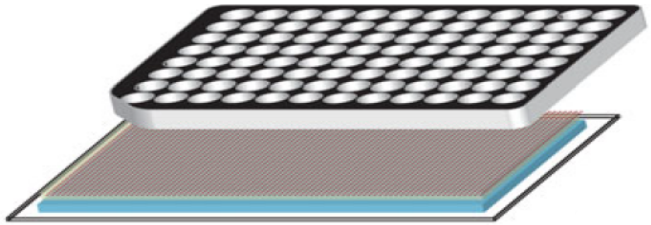


- How was recovery tested?
- What type of DNA damage are we measuring with the CometChip experiment?

Details for CometChip experimental steps

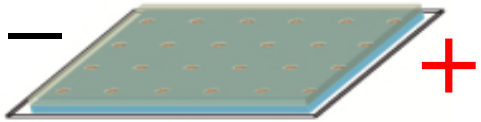


How do we visualize DNA damage?

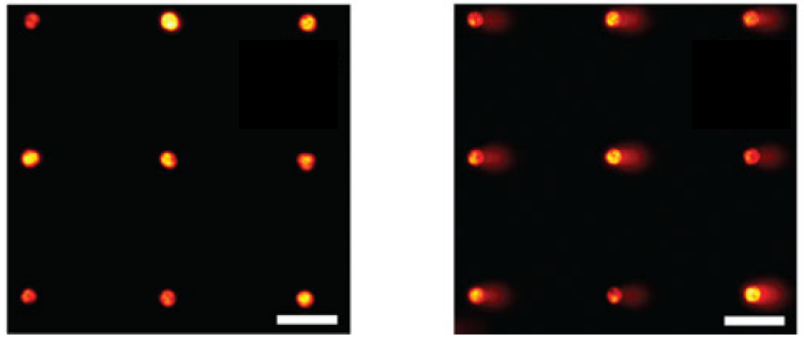


treat captured cells in comet chip with H_2O_2 and As

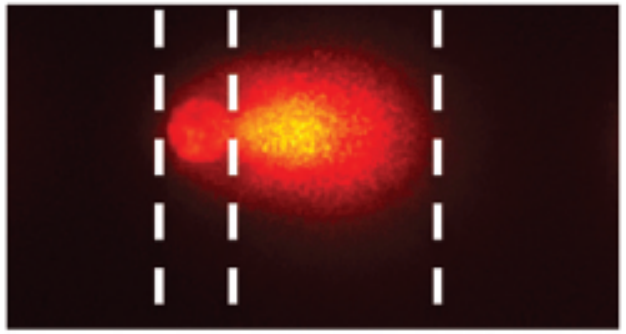
lyse cells & unwind DNA



agarose electrophoresis



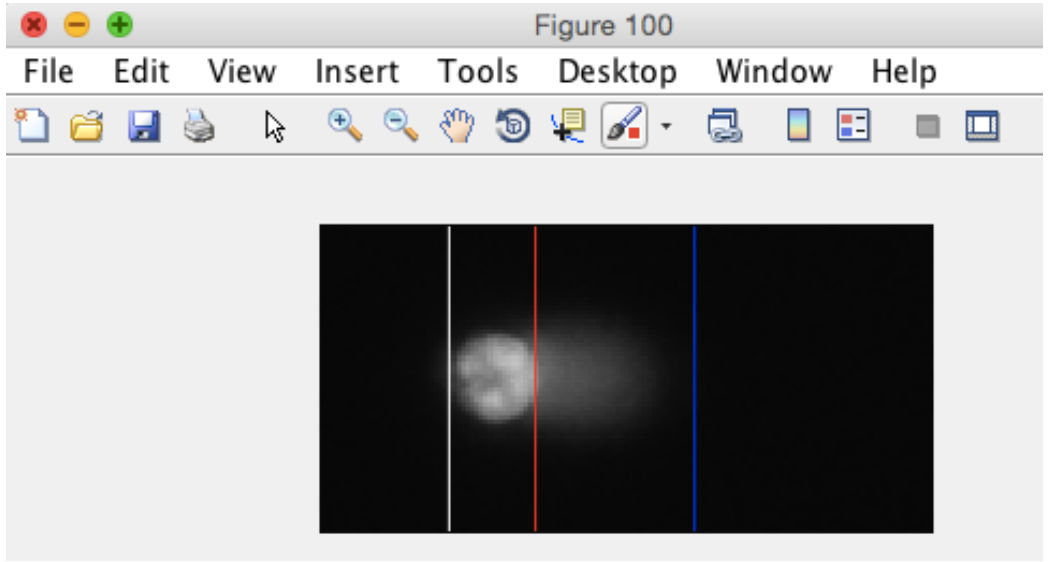
stain DNA and image via fluorescence microscopy



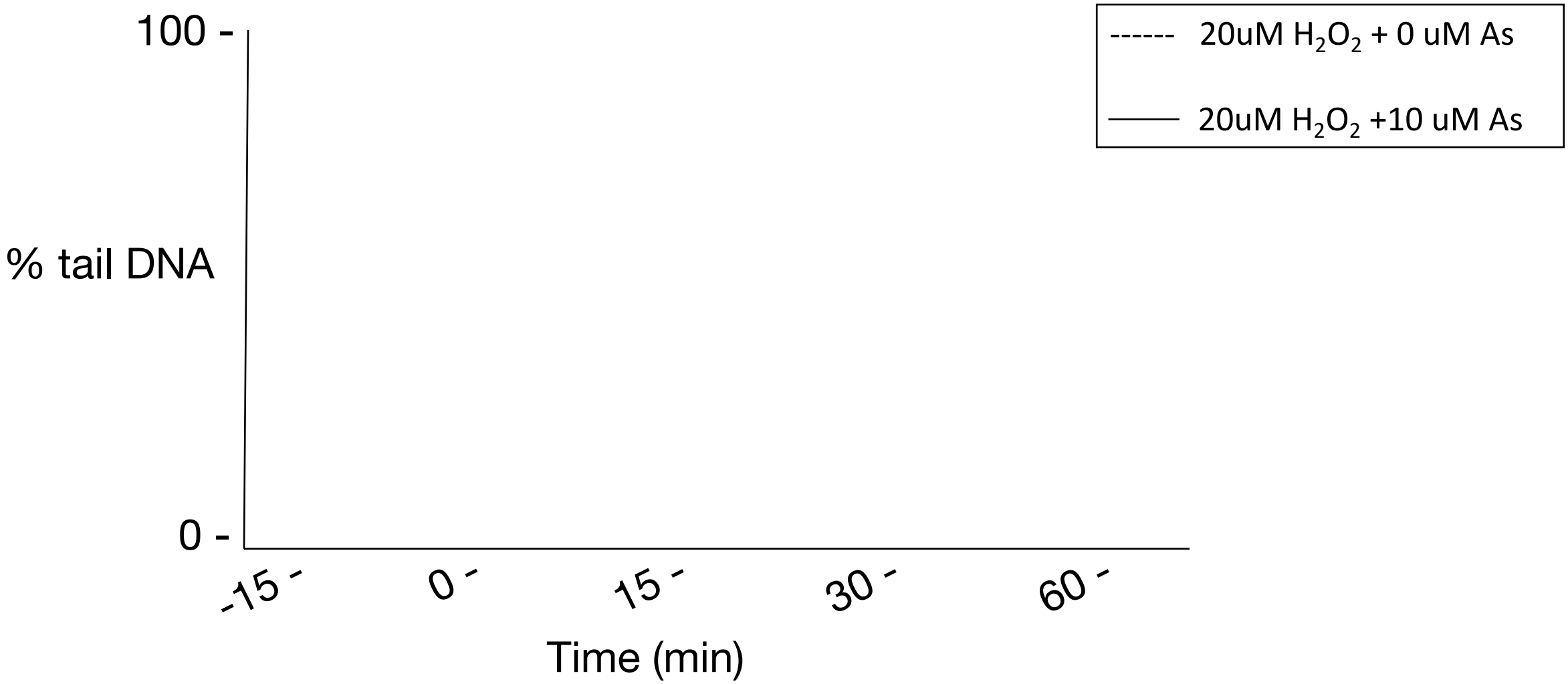
analyze using Matlab

How do we quantify CometChip data?

- Assess comet images in Matlab
  - Do recommended parameters (on wiki) accurately measure most comets in your sample?
- Compare % Tail DNA between comets from Matlab analysis
  - Do the data appear consistent?
- Use Excel to analyze compiled CometChip data

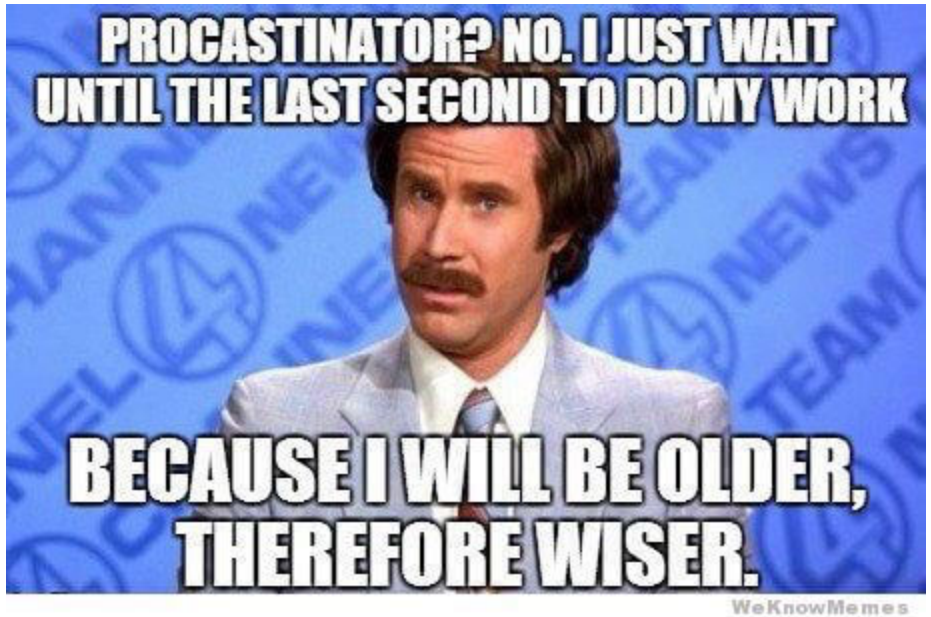


How will you plot CometChip data?



For today…

- Work through CometChip data analysis
  - Record your notes in your laboratory notebook
- Continue gamma-H2AX data analysis
- Strategize for Data summary preparation



For M1D7…

- Outline Implications & Future works section

Notes on the Data summary…

Sections to include:

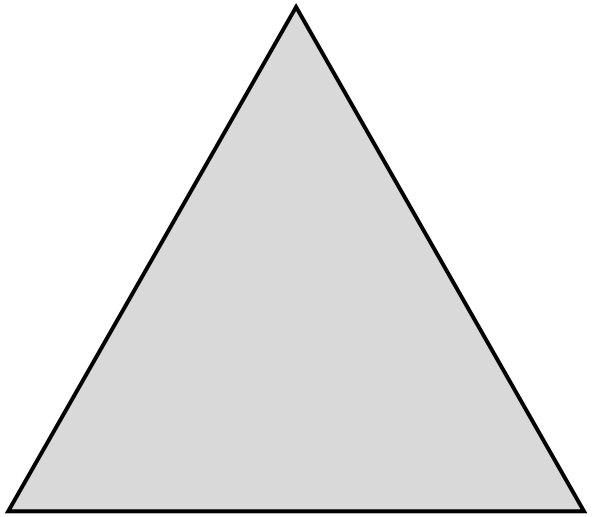
1. Title
2. Abstract
3. Background & Motivation
4. Figures, Results & Interpretation
5. Implications & Future work

What figures should be included?

Notes on Implications & Future works…

- Start with a very similar paragraph to the last paragraph in your Background/Motivation (restate major results and broad implications)
- Follow same order as in Figures/Results
  - Tie together the conclusions from your data
  - If necessary, describe caveats of experiment and suggest improvements
  - Identify unknowns and speculate (within reason)
  - Don’t make huge generalizations or overreach the results shown
- Propose future experiments, identify new questions that arise
  - Incremental next steps that can be tested / measured
- Come back to the big picture / impact statement topic introduced in background

How should you conclude your story?



- What are the main findings / conclusions?
- What are the implications of the results?
- How do the results relate to the research question / hypothesis?
- How do the results advance what is known?

Implications and Future Work: potential topics [edit]

- ***Topic***: Did your results match your expectations?
  - If no, provide a putative explanation. If yes, how can you further test if your hypothesis is correct?
- ***Topic***: Based on the results, whether they matched your expectations or not, what experiments might you recommend next?
  - Follow-up experiments could distinguish between competing explanations of a given outcome or broaden the sample set for a question you already asked, to give just two examples.
- ***Topic***: How might this assay be improved?
- ***Topic***: How might this assay be used as a research tool? in the clinic? in industry?