**MEETING NOTES**

**2014-07-24**

Discussion of future work with the mechanical-load clamp, ver.2

* Stiffness examples confirm that new clamp performs just as well, or better than, previous clamp
* Regarding stiffness, what do we want to learn?
  + Spiking versus limit-cycle oscillations -> Calculate the residence time distribution. Spikes will be Poisson
    - Detrend/center time trace
    - Initialize vector of zeros
    - Find excursions with moving windows and update those below some threshold with ones – Moving window with mean and standard deviation -> choose window size, thresholds (mean+m\*std\_up, mean-n\*std\_down)
      * Or median and median absolute deviation (mad(x,1))
    - Find spikes in vector as ones
    - Gives times for up and down states
    - Can also set up a buffer region between two thresholds that is not counted – vectors of 1, 0, and 0.5
    - **How much time do we need?**
      * Try with an artificial trace first at different lengths of time first
      * Will determine how much of the state diagram we can map with this method
      * Do this for a few operating points in DIFFERENT bundles for long periods of time (e.g. five points per bundle)
    - Goal:
      * RTDs for spiking in both directions, limit cycles (five operating points), also for bistable and multimodal(?)
        + Do this both at the head and the tail of the fish, finding difference between classes of excitability
      * Hold at different offset forces and quantify spike frequency
        + Do this both at the head and the tail of the fish, finding difference between classes of excitability
* Revisit mass and drag
* Calculate the mass of a borosilicate glass cylinder with the dimensions of a stimulus fiber.
  + Should this be added to the load clamp?

**2014-07-31**

Discussion of gentamicin controls

* The previous gentamicin controls did not have enough time (only one second) per operating point.
* As a result, the analysis was poor:
  + Significance was sometimes found for different parameters, with very small p-values, in the control data
  + One cannot tell if this behavior is real or if it is due to the short time traces
  + Additionally, it is hard to tell if a bundle is oscillating with only one second of data (with only 500 ms on average analyzed)
* PLAN: Repeat the gentamicin experiments on robustly oscillating hair bundles

**2014-08-07**

Review of new gentamicin data and use of state diagram analysis tools