**Date and Time**: 05 Sep 2024, 8:30am

**Location**: Zoom

**Attendees**: Dr. Backus, Dr. Reif, Dr. Cooper, Prof. Hope, Zachary, Milo, Lillian, Mehrezat, Devanshi

**Objectives**

* Get more background
* Look at the data and gain insights into how it is collected and the challenges and inconsistencies in the process

**Minutes** (taken by Milo & Devanshi)

* General conversation about logistics, Zoom room administration (8:30)
* Dr Cooper joins (8:37) and introduces herself
* Introductions (8:37)
* Funding focus on mosquito dataset and what the data needs are (8:43)
* Reports need to be mosquito focused (for the funders) although we can have other species involved and use their data sets. All official communications about our process need to highlight the results in terms of mosquito data.
* We took a look at Backus & Patterson 2023 paper on the R-EMF problem (Remf Manuscript) (8:47)
  + Building our understanding of how different sizes of insects require different resistances under conductivity
  + Set R level for different insects which change the appearance of the waveforms. Magnify the EMF waveforms
* Dr. Cooper presents on mosquito waveforms (8:52)
  + We take a look at Wayadande Backus et al 2020 mosquito EPG
  + Description of waveform types for these mosquitos. Looked deeper into waveform types L3, M3, M4 (1172, Insect Science, Cooper 2023)
  + Classification of mosquito feeding periods (variations and recognizing differences visually, our task is to train computer to recognize all of these)
  + High variation of the waveforms between M\_ and L\_
  + Changing the settings of the instrument changes the waveform drastically (R-EMF problem)
  + Looked at summer 2023 recordings powerpoint
  + Looked at Cooper ICE 2024 midge waveforms
  + Looked at Jove protocol paper
  + Variation in waveform appearance:
    - Internet: insect, host, species, R level
    - Procedural: setup (i.e attaching electrodes incorrectly, offset incorrect – waveform needs to be recognizable under rotation)
* Dr. Bachus Aphid waveforms (9:07)
  + Have both positive and negative waveforms with rectifier at 0 due to potential drop waveform
  + Looking at 3rd generation ACDC model (both ACx citation, DCx citation required
  + Previously a rectifier was thought to be always necessary
  + Demo of how to use windaq
  + Looked at windaq recordings that exemplify the waveforms we are looking for
  + Standard measuring for mosquitoes is done at compression 1 and 5 (Dr Cooper sends chat 9:21)
* Aphid data will have all the same RI level, mosquito data will have many different RI levels (for mosquito data doesn’t have as much difference).
* Dr. Reif asks: do we treat the data as separate for each species or lump all of it together
* Data labels will be integer-keyed and need to convert to

**Takeaways**

* There is substantial variation within the data based on aspects of what is being measured, and there is also variation by who is measuring. This will be a challenge and this additional noise means we will need more data to extract signals or find ways to use human labeling to highlight points of uncertainty. More thought is required here.
* Dr Backus will send us the data within a week or so (specifically, the data for 50 aphids for 8 to 10 hours)

**Action Items**

* Create a document to answer Dr. Reif’s question on how we will treat data from different species
* This document will also include requirements and specifications for what data we need, in terms of species, RI level, post-processing, etc