**Grad School**

Gayle proposed that I might complete my graduate degree at Wololab, building off work that I have already completed on the Dog Tissue archive. Working in lab has benefits, a quicker graduate progam, work with friends, and the opportunity to contribute to Wololab’s continued success. The danger is that the environment might be inadequately suited to support my research interests. With that in mind the following details my science goals.

**Science Goals**

There are two lines of biology that I am interested in exploring. One is a theoretical exploration of information processing in cellular biology, and the other is model building in cell signaling responses.

Cellular information processing is an appealing study because it quantifies the complexity of modeling cellular processes and the capacity of cells to conduct meaningful computations about their environments and selves. The more computationally rich a cell is the more difficult it will be to model and the more information that it will contain about itself and its environment. Work has been done to characterize the computational properties of the immune system, gene regulatory networks, and genomic rearrangements in ciliates. I’d like to extend this work to RNA editing.

The information processing capacity of a cell has implications in the study of cell signaling. The sophistication of cell’s information processing relates directly to how sophisticated its communications can be. Moreover, we are aware that signaling determines a number of cell phenotypes and behaviors, most notably in development, immunity, and tissue repair. Working on cell signaling systems offers the prospect of accessing the information contained in these communications and the benefit of developing and testing hypothesis with a speed proportional to the signaling frequency. In order to realize the potential speed of hypothesis development in cell signaling it is necessary to employ machine learning algorithms which can continually adjust and improve their models on the millisecond time frames that are relevant in cell signaling. The bottom line is that applying machine learning techniques to cell signaling offers the prospect of developing more science cheaper.

**Assessment**

Ideally, I would like to find a graduate program that focuses on computer science and statistical model building and a laboratory that works on sophisticated cell signaling techniques. If I am accepted to a program that fits those criteria exactly, I would be hard pressed to turn it down. However, if I have to compromise on one point or another, it seems that the Wololab compromise would be one of the most appealing.