

Introduction to Biomedical Engineering: Spring 2021

Homework 1

Due: **3/25 PM 1:10**

Please submit your homework in .doc/.docx format to me (chuang@mail.ee.nsysu.edu.tw). The file name should appear as “your student ID”-hw1. For example: **B069011099-hw1.doc**.

Try to organize your materials rather than just copy-and-paste. You are encouraged to indicate your reference (either websites, books or published papers) in a formal format. Last but not the least, NO late homework permitted.

1. Sir Alan Hodgkin and Sir Andrew Huxley received the 1963 Nobel Prize in Physiology and Medicine for their iconic Hodgkin-Huxley model, which is regarded as one of the most important achievements in biophysics. Please explain how this model works by introducing its basic components and characterizing the mathematical differential equation. An illustrative diagram may help.
2. The main purpose of the myelin sheath, the dielectric layer usually around the axon, is to speed the neural transmission along the myelinated fiber. It was found that abnormal demyelination could happen in neuro-degenerative diseases, such as multiple sclerosis, and decrease the conduction velocity of neural fiber. What is the conduction velocity of the myelinated and unmyelinated fiber of **human being** respectively? Please specify your reference and the measuring method.