**An Overview of my Case Study**

Peptide quantitation is an important aspect of biochemistry and molecular biology that helps in understanding the concentration of peptides in samples (Song et al., 2023; Csibra and Stan, 2022). Among the diverse methods to quantify peptides, fluorescence-based assays are particularly notable for their sensitivity and specificity (Csibra and Stan, 2022’ Fang et al., 2019). Moreso, several questions come up whenever fluorescence-based peptide quantification method comes to mind: Is there any relationship between peptide concentrations and fluorescent intensity of samples? If a relationship exists, what is the strength of the relationship between the variables? Can peptide concentration be estimated using the fluorescent reads? Given that fluorescence-based assays revolve around the linear relationship between peptide concentrations and the fluorescent intensity of the samples, reports have indicated that it is feasible to estimate peptide concentrations based on the fluorescent reads (Hall et al., 2016)). However, the process of running the wet lab, and generating the standard plot using other statistical tools for peptide estimation in a sample can be tedious, costly, and time inefficient. To make the estimation process easier and more efficient, I decided to test ChatGPT’s resolve to help with the generation of R codes to develop an automated tool to visualize the relationship between the two variables and make estimation based of the relationship. ChatGPT is a large language model (LLM) and has been reportedly used in the creation of shinny apps (Dario, 2024).

This case study titled “Using ChatGPT to create a Shiny app (PepQuant) for visualization and estimation of peptide concentration in a sample” is intended to create a shiny application that facilitates peptide quantification by allowing researchers to upload CSV files containing peptide concentration (in µg/mL) and Relative Fluorescent Units (RFU) data either from their local system or through a URL. My goal is to use ChatGPT generated shinny R codes to understand if there is any relationship between peptide concentrations and fluorescent intensity of samples. If a relationship exists, then understanding the strength of the relationship between these variables becomes important towards peptide concentration estimation using the fluorescent reads. To achieve this, I prompted ChatGPt repeatedly for a functional shiny R code to enable me to achieve my objectives following a modification of the method used by (Whiting, 2022). The series of prompting led to the generation of both functional and nonfunctional codes which has been documented and deposited bin Github. Cumulatively, the prompts led to over ninety lines of R codes that successfully generated the desired Shinyapp using R (R Core Team 2024). The code included packages such as “shiny”, “ggplot2” and “readr” that make it easy to build interactive web applications directly from R, improves data visualization, and read rectangular data like csv. The key features of the app include data input options either local .csv upload or through a URL and an option to specify whether the dataset has header information, data visualization through a scatter pot that shows the relationship between the variables, regression analysis as the app calculates the R2 value to quantify the strength of the linear relationship between concentration and RFU, and concentration estimation as researchers can input RFU values and the app estimates the corresponding peptide concentration using the linear regression model fitted from the dataset. This underscores its usefulness in data analysis and quality control as well as experimental design and sample preparation.

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