Presently it is common practice for doctors to dose individuals based on a range given from the Physician Desk Reference. The dose range is based off a series of clinical test done by pharmaceutical companies and dosed based on an individual who is 70 kg. Prescribers adjust some medicine based on the weight of individuals especially in pediatrics. Adjustments can be based on pharmacokinetics which takes into account the average rate that people break down and eliminates drug in their system. With taking this into account along with the volume of plasma in an individual (based on weight) a prescriber can reach a target concentration (therapeutic concentration) (Hayat *et al*., 2014).

The issue with this method is one it is not common practice due to the complex math behind it but also that the elimination rate of a drug is based on an average instead of an individual. In order to take into account, the rate that an individual eliminates a drug from their body we have to look at a few different things. First we figure out what enzymes break down the active components of the drug in question and how much of the drug does each enzyme break down. Then we look at the rate that each enzyme breaks down (metabolizes) a drug. The metabolic rate of each enzyme can be figured out based on DNA sequencing. Using DNA sequencing we can find genetic markers that are associated with each enzyme. Based on these markers we can categorize the metabolic rate of an enzyme as either a poor metabolizer, ultra-rapid metabolizer, or extensive metabolizer (Ma *et al*., 2011). This in combination with an individual’s weight allows us to calculate a personalized dose range for a patient.

In order to calculate the dose for each patient we will create a quarry based on the previously mentioned information. Through creating a database that holds all the information, it allows easy reference for doctors on future dosing. It also creates a system in which all the information stored about several individuals and the results of the dosing be used to improve the dosing model for future prescribing.