Project Summary: Insulin Control

Objective: Develop a reinforcement learning-based insulin control system that maintains blood glucose levels within a healthy range for diabetic patients.

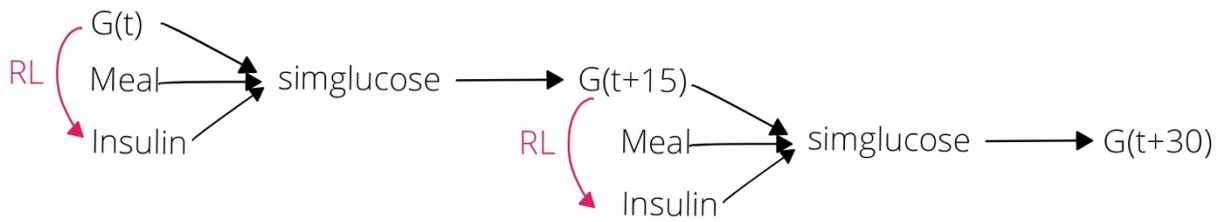
Motivation: Optimal glucose control is critical to prevent complications in diabetic patients. Traditional methods tend to be rigid and non-adaptive. Using RL, we aim for the insulin agent to learn adaptive strategies in response to unpredictable variations in food intake.

System Description:
The system is meant to be discrete with data being generated every 15 minutes. The meal with its carbs level is an input translated by simglucose library into a glucose level G(t).

Insulin Agent: Learns to administer insulin based on observations of glucose levels, with a reward function penalizing both hypoglycemia and hyperglycemia.

The more you stay in the sane range the more you accumulate rewards.

At the beginning if the glucose level is not in the range, the insulin shot is randomized in a "safe" range, then the algorithm should learn the optimal level according to G(t).
At this point simglucose calculates G(t+15 min) considering also the meal and at t+15 min the algorithm check again the level of glucose and decides what to do.



Environment: Based on the *simglucose simulator,* which models glucose dynamics in the human body.