

Ryan Kim

Biochemistry, CBS, 2008

Mentor: Do-Hyung Kim,
Biochemistry, Molecular Biology,
and Biophysics Department

Regulation of Glucose Transporter 4 Transportation by Proline-Rich Protein 5

Glucose Transporter 4 (GLUT4) is a protein that brings in sugar molecules called glucose from the bloodstream into the cell and vice versa. GLUT4 is stored always inside the cell until a hormone from the bloodstream called insulin, signals the target cells to bring GLUT4 to the plasma membrane, the cell's surface. Once the cell detects insulin, a signaling cascade initiates until it reaches the Mammalian Target of Rapamycin, also known as mTOR, a serine/threonine protein kinase that is the master control of cell growth and differentiation. From there, the mTOR, through protein binding and phosphorylation, signals GLUT4 to move to the plasma membrane. Should the signaling pathway not work in numerous cells, individuals run the risk of obtaining dangerous health conditions such as diabetes. My experiment observes GLUT4's relationship with another protein called Proline Rich Protein 5 (PRR5). PRR5 binds to mTOR and silences the signals between the insulin and mTOR. My hypothesis is that there is an inverse relationship between PRR5 expression and GLUT4 transportation: the less PRR5 is expressed, the more GLUT4 could move to the plasma membrane and vice versa. My experiment involves adding two types of genetic material into the cell using viruses: one that will silence the expression of PRR5 and another that will overexpress the protein. After confirming the viral infection, I will use a confocal microscope with GLUT4 antibodies to observe the location of the GLUT4 molecules and compare them to normal cells.



Poster Number: Session: