Analysis of Protein Structure Prediction for cause of Glucagonoma and its effect when hDAT drug is introduced to it using PyMOL and BLAST tool

The interaction between glucagon and Dipeptidyl Peptidase IV (DPP-4) is primarily related to the regulatory role that DPP-4 plays in the metabolism of glucagon. Here are key points to understand this interaction:

### **Understanding the Interaction**

1. **Function of Glucagon**:
   * Glucagon is a hormone that raises blood glucose levels by promoting glycogenolysis (breakdown of glycogen) and gluconeogenesis (production of glucose) in the liver.
2. **Role of DPP-4**:
   * DPP-4 is an enzyme that inactivates several hormones, including glucagon. It does this by cleaving specific peptide bonds in these hormones, leading to their degradation.
3. **Mechanism of Interaction**:
   * When glucagon is released into the bloodstream, DPP-4 can bind to it and cleave it, reducing its effectiveness in raising blood sugar levels.
   * This interaction is crucial in maintaining glucose homeostasis, particularly in conditions like diabetes where glucagon levels may be abnormally high.

### **What to Look For in PyMOL**

When you visualize glucagon and DPP-4 in PyMOL, you want to:

* **Examine Binding Sites**: Look for potential active sites on DPP-4 where glucagon might bind. This is often where the enzyme would cleave or inactivate the hormone.
* **Analyze Structural Proximity**: Measure distances between glucagon and DPP-4 to see how closely they might interact.
* **Identify Key Residues**: Look for amino acid residues in DPP-4 that are involved in binding or cleavage of glucagon.

### **Summary of Interactions**

1. **Binding**: DPP-4 binds to glucagon.
2. **Cleavage**: DPP-4 cleaves glucagon, leading to its inactivation.
3. **Regulation**: This interaction helps regulate blood glucose levels.