Structure of Lys B28 Pro B29 Insulin

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When insulin diffuses into blood streams, it is broken down from hexamer to monomer. LysB28 ProB29 insulin, however, is theorized to have a monomeric structure instead of the hexameric structure of the normal human insulin. And wouldn't need to be broken down. Lys B28 Pro B29 is therefore more capable, accurate and more efficient than normal human insulin. The goal for this project was to analyze the structure of protein LysB28 ProB29 Human insulin through an application called Pymol, and determine the structure of this protein. To achieve this goal, three main steps were needed. The first step was protein production through E. Coli. The sample then went through two steps of Purification: Nickel column and Superdex 200. Then proteins were crystallized using 192 different buffers. The results indicated the buffer (1.6 M Magnesium Sulfate Heptahydrate 0.1 M MES Monohydrate pH 6.3) produced the best crystallized insulin. Crystallized proteins were then placed under x-ray. Data was then collected and analyzed by Pymol. By examine the 3D structure of this protein in Pymol, it was determined that the protein was no longer a hexamer but a dimer. Also, the protein retained its Alpha and Beta chain structure. In conclusion, the goal of this project was achieved. It was proven that the alternative insulin configuration (Lys B28 Pro B29) was possible.

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