World Academy of Science, Engineering and Technology
International Journal of Biotechnology and Bioengineering
Vol:8, No:12, 2014

A Geometrical Perspective on the Insulin Evolution

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Abstract : We study the molecular evolution of insulin from the metric geometry point of view. In mathematics, and particularly in geometry, distances and metrics between objects are of fundamental importance. Using a weaker notion than the classical distance, namely the weighted quasi-metrics, one can study the geometry of biological sequences (DNA, mRNA, or proteins) space. We analyze from the geometrical point of view a family of 60 insulin homologous sequences ranging on a large variety of living organisms from human to the nematode C. elegans. We show that the distances between sequences provide important information about the evolution and function of insulin.

Keywords : metric geometry, evolution, insulin, C. elegans
Conference Title : ICBBE 2014 : International Conference on Bioinformatics and Biological Engineering
Conference Location : Bangkok, Thailand
Conference Dates : December 24-25, 2014