

3D-Models of Enzymes

Talk to a Teacher

<http://spoken-tutorial.org>

National Mission on Education through ICT

<http://sakshat.ac.in>

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Learning Objectives



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- **Load structure of *Human Pancreatic Hexokinase* on Jmol panel**



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- ▶ **Load structure of** *Human Pancreatic Hexokinase* **on Jmol panel**
- ▶ **Modify the display of** *secondary structure*



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- ▶ **Load structure of *Human Pancreatic Hexokinase* on Jmol panel**
- ▶ **Modify the display of *secondary structure***
- ▶ **Highlight amino acid residues at the active site**



Learning Objectives



Learning Objectives

- ▶ Highlight substrate and cofactors of the enzyme



Learning Objectives

- ▶ Highlight substrate and cofactors of the enzyme
- ▶ View *Ramachandran* plot for protein



Pre-requisites



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- ▶ Knowledge of basic Biochemistry



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- ▶ **Familiar with basic operations from Jmol Application window**



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- ▶ Familiar with basic operations from Jmol Application window
- ▶ **‘Proteins and Macromolecules’ in Jmol Application series**
<http://spoken-tutorial.org>



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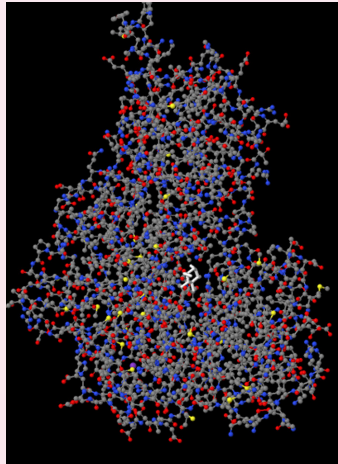
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- ▶ **Mozilla Firefox Browser 22.0**



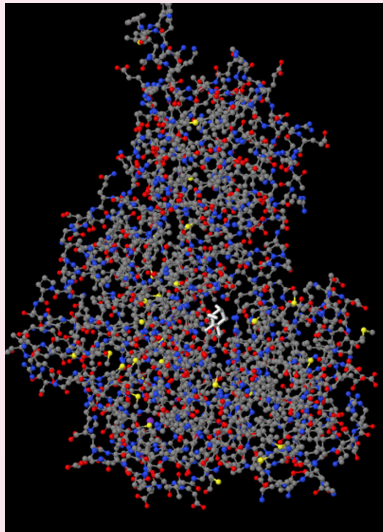
Human Pancreatic Hexokinase

- * Monomeric protein of 465 amino acids
- * 2 Domains: Large domain and small domain.
- * Active-site is located in the cleft between two domains.



Human Pancreatic Hexokinase

- * **Active-site has 3 amino acid residues, *Asparagine 204*, *Asparagine 231*, *Glutamic acid 256*.**
- * ***Alpha-D-Glucose* as substrate.**



Summary

- ▶ Load structure of Human Pancreatic Hexokinase using *PDB* code (*3IDH*)
- ▶ Modify the display of secondary structure
- ▶ Highlight amino acid residues at the active site



Summary

- ▶ **Highlight substrate and cofactors of the enzyme**
- ▶ **View Ramachandran plot for proteins**



Assignment

- ▶ Load the .pdb file of enzyme Lysozyme on Jmol panel
- ▶ Highlight the substrate bound to the enzyme
- ▶ Highlight the amino acids at the active-site



About the Spoken Tutorial Project

- ▶ Watch the video available at http://spoken-tutorial.org/What_is_a_Spoken_Tutorial
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Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test
- ▶ For more details, please write to contact@spoken-tutorial.org



Acknowledgements

- ▶ Spoken Tutorial Project is a part of the Talk to a Teacher project
- ▶ It is supported by the National Mission on Education through ICT, MHRD, Government of India
- ▶ More information on this Mission is available at

<http://spoken-tutorial.org/NMEICT-Intro>

