

# *Proteins and Macromolecules*

**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 structures of proteins from *Protein Data Bank (PDB)***



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- ▶ **Download .pdb files from PDB database**



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- ▶ **Download .pdb files from PDB database**
- ▶ **Display secondary structure in various formats**
- ▶ **Highlight hydrogen bonds and disulfide bonds**



# Pre-requisites



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- ▶ If not, watch the relevant tutorials available at <http://spoken-tutorial.org>



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- ▶ **Mozilla Firefox Browser 22.0**



# Jmol for Biomolecules

## Structure analysis of large biomolecules

- ▶ *Proteins and Macromolecules*
- ▶ *Nucleic acids (DNA and RNA)*
- ▶ *Crystal structures and Polymers*



# Summary

- ▶ **Load structures of protein from *Protein Data Bank (PDB)***
- ▶ **Download .pdb files from the database**
- ▶ **View 3D structure of insulin using *PDB code (4EX1)***



# Summary

- ▶ **View protein structure without water molecules**
- ▶ **Display secondary structure in various formats**
- ▶ **Highlight hydrogen bonds and disulfide bonds**



# Assignment

- ▶ Download the .pdb file of human Hemoglobin from *PDB* database
- ▶ Show secondary structure in cartoon display
- ▶ Highlight the *Porphyrin* units of the protein

<http://www.rcsb.org/pdb/home/home.do>



# About the Spoken Tutorial Project

- ▶ Watch the video available at [http://spoken-tutorial.org/What\\_is\\_a\\_Spoken\\_Tutorial](http://spoken-tutorial.org/What_is_a_Spoken_Tutorial)
- ▶ It summarises the Spoken Tutorial project



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- ▶ It summarises the Spoken Tutorial project
- ▶ If you do not have good bandwidth, you can download and watch it



# 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](mailto: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>

