

# Structure Manipulation

**Talk to a Teacher**

**<http://spoken-tutorial.org>**

**National Mission on Education through ICT**

**<http://sakshat.ac.in>**

**Snehalatha Kaliappan**

**IIT Bombay**

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# Learning Objectives



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- ▶ **Open a structure on the Chimera window**



# Learning Objectives

- ▶ **Open a structure on the Chimera window**
- ▶ **Move, rotate and zoom the structure**



# Learning Objectives

- ▶ Open a structure on the Chimera window
- ▶ Move, rotate and zoom the structure
- ▶ Scale and clip the structure



# Learning Objectives

- ▶ Open a structure on the Chimera window
- ▶ Move, rotate and zoom the structure
- ▶ Scale and clip the structure
- ▶ Change the display



# Pre-requisites



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- **Undergraduate Biochemistry**





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- ▶ **Undergraduate Biochemistry**
- ▶ **Structural Biology**



# System Requirement



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- ▶ **Ubuntu OS version 14.04**



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- ▶ **Chimera version 1.10.2**



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- ▶ **Mozilla firefox browser 35.0**



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- ▶ **Chimera version 1.10.2**
- ▶ **Mozilla firefox browser 35.0**
- ▶ **Working internet connection**



# UCSF Chimera



# UCSF Chimera

- ▶ **Software for interactive visualization and analysis of molecular structures**





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- ▶ Software for interactive visualization and analysis of molecular structures
- ▶ Developed by the Resource for Biocomputing, Visualization, and Informatics (University of California, San Francisco)



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- ▶ <http://www.cgl.ucsf.edu/chimera>



# Summary



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- ▶ **Open a structure on the Chimera window**
- ▶ **Download pdb files from PDB database**
- ▶ **Move, rotate and zoom the structure**
- ▶ **Scale and clip the structure**



# Summary

- ▶ **Change the display using menus.**
- ▶ **Remove the water molecules**
- ▶ **Add hydrogens**



# Assignment



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- Download the pdb file of **Leucine zipper** (pdb code 1zik) from PDB database



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- ▶ Download the pdb file of **Leucine zipper** (pdb code 1zik) from PDB database
- ▶ Open the pdb file on Chimera window using **open** option in **File** menu





# Assignment

- ▶ Download the pdb file of **Leucine zipper (pdb code 1zik)** from PDB database
- ▶ Open the pdb file on Chimera window using **open** option in **File** menu
- ▶ Change the display to **wire** and all the aromatic structures as **disks**



# 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>

