

# Chimera Movie Making

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This tutorial shows how to make animations using Chimera for use on web sites, in journal articles, and talks. We will use maltotriose binding protein, PDB [2gha](#), and Chimera 1.7 snapshot version from September 2012 for our examples.

## Topics

- Spinning a molecule.
- Special effects: silhouette edges, shadows, background color.
- Movies with several motions. Command scripts.
- What to show in an animation. Morphing example.
- Saving your work. Use a session file to setup the initial scene.
- Optional: How to put an animation in a web page.

## Spinning a molecule

- Open 2GHA.pdb.
- Delete chain B. *Select / Chain / B and Actions / Atoms / Delete*
- Color ribbon. *Preset / Interactive ribbons*
- Highlight ligand. *Select / Structure / Ligand and Actions / Atoms / Sphere*
  
- Rotate 360 degrees. *Favorites / Command-Line*  
**turn y 1 360**
- Record "spin" movie.  
**movie record ; turn y 1 360 ; wait ; movie encode**
- Semicolons separate commands on one line.
- **movie record** starts capturing images.
- **wait** prevents going to the next command until motion finishes.
- **movie encode** writes the images to a movie file.



## Special effects: silhouette edges, shadows, background color

- Background white. Command **set bg white**.
- Silhouette edges. *Tools / Viewing Controls / Effects*.
- Enable shadows.
- Background gradient. *Favorites / Preferences*, category Background, background method gradient
- Gray gradient. Click background gradient color well.
- Set window size. Command **window size 640 480**.
- Record movie, 2 degree steps, supersample to smooth edges.

**movie record supersample 3 ; turn y 2 180 ; wait ; movie encode**



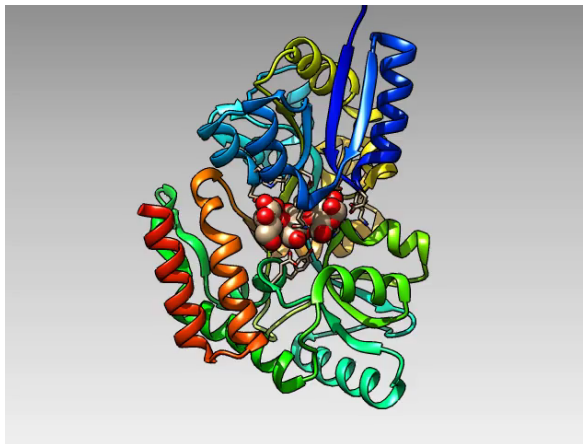
## Movies with Several Motions: Command scripts

- To make more complex movies put commands in a plain text file and run it.
- Try this using Text Edit on Mac, or Note Pad on Windows, or any text editor.

```
movie record
turn y 2 180
wait
movie encode
```

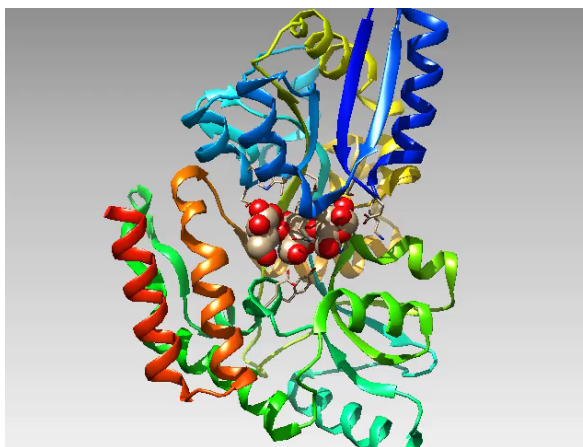
- Zoom in on ligand and do second spin.
- Interactively try this command: **scale 1.02 80**
- Make rotation about center of ligand. Select central ligand atom. *Actons / Set Pivot*

```
movie record
turn y 2 180
wait
scale 1.02 80
wait
turn y 2 180
wait
movie encode ~/Desktop/spin3.mp4
```



- Fade out ribbon so it does not block view of ligand.
- Interactively try this command: **transp 80,r**
- Turn off silhouettes to deemphasize ribbon.
- To make duller transparency try: **set flat**
- To smoothly fade to transparent ribbon use: **movie crossfade 25**

```
movie record
turn y 2 180
wait
scale 1.02 80
wait
movie crossfade 25
transp 80,r ; set flat
turn y 2 180
wait
movie encode ~/Desktop/spin5.mp4
```

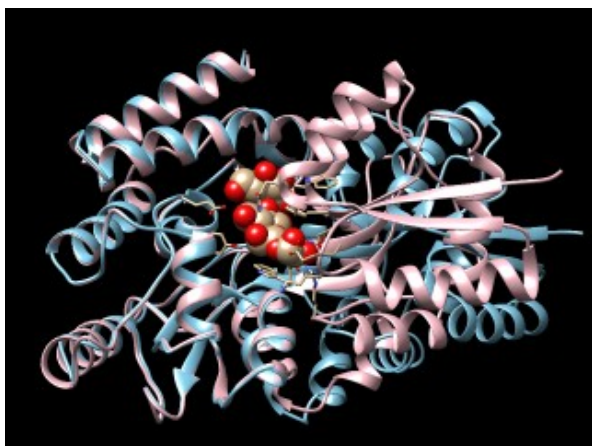


## What to show in an animation. Morphing example

Many of the commands useful in making movies are demonstrated on the [Movie Examples](#) page on [Chimera web site](#) under [Documentation](#).

Morphing is one of the most useful kinds of animation, making it easier to see differences between two conformations of a molecule.

- Open 2ghb.pdb, no maltotriose ligand bound.
- Delete chains B and C.
- Use MatchMaker to align 2ghb to 2gha. *Tools / Structure Comparison*
- Color 2gha ribbon pink. Command **color pink,r #0**
- Morph using *Tools / Structure Comparison / Morph Conformations*
- Hide original structures with *Favorites / Model Panel*
- Show ligand from 2gha: **~ribbon #0 ; ~display #0 ; display ligand**
- Show morph residues near ligand: **disp #2 & ligand zr<5**
- Use MD Movie dialog *File / Record Movie...*
- To use morph in a command script: **coordset #2 1,41**



Structure superposition.



Morph movie.

## Saving your work. Use a Session File to Setup the Initial Scene

To save your movie making work, save a Chimera session that sets up the scene, and use a command script that records the movie.

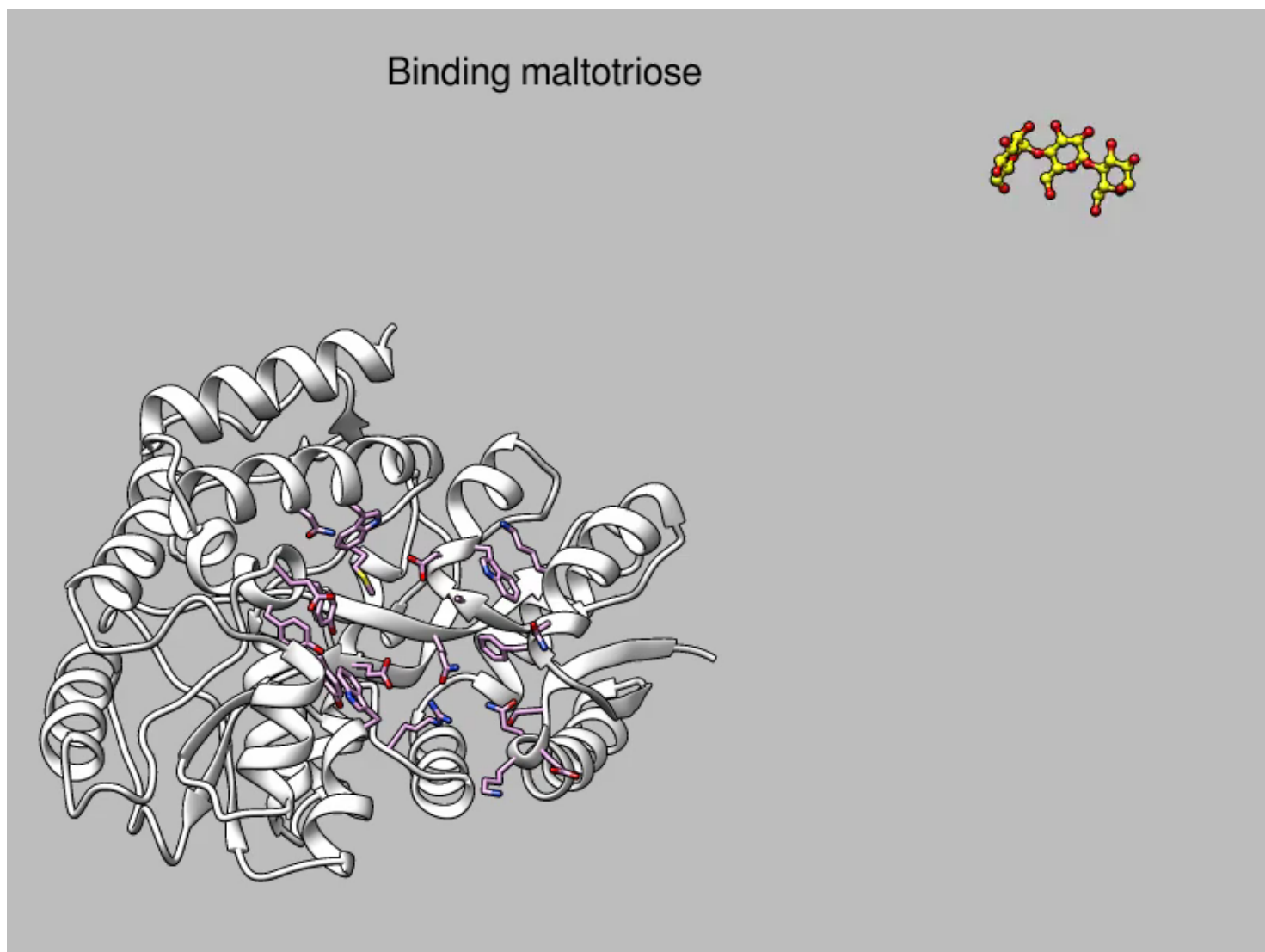
- Save session with calculated morph. *File / Save Session As...*
- Save command script that records the movie.

```
movie record
coordset #2 1,41
wait
movie encode
```

- For each movie you make keep 3 files: the Chimera session, the command script, and the movie (**morph.py**, **morph.cmd**, **morph.mp4**).
- This allows you to later improve the movie, change its size, etc. with little effort.

## A Fancier Movie Example

Includes titling (**2dlabel**), ligand fly in (**savepos / reset**), hydrogen bond display (**hbond**), surface display (**surf**).



Other example animations are on the Chimera [Animation Gallery](#) web page.

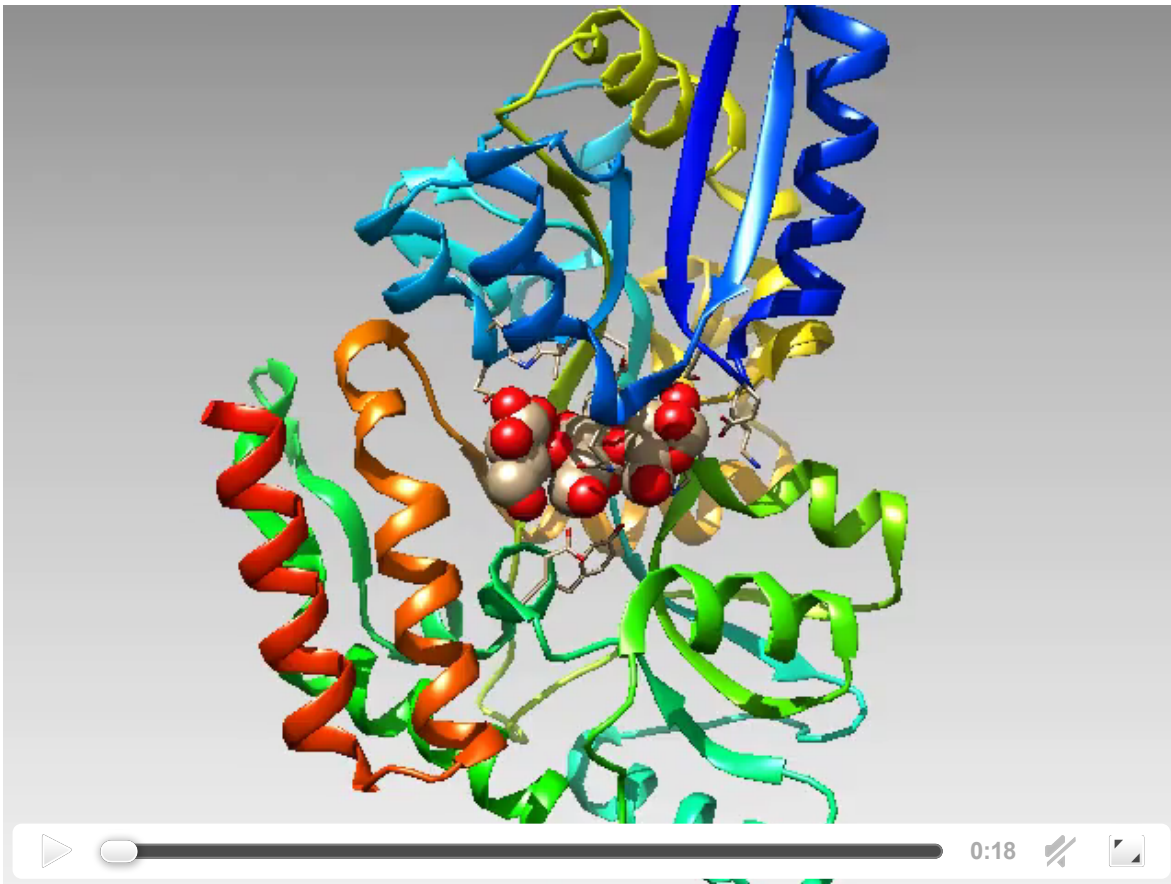
## How to put an animation in a web page

- Use HTML5 video tag to embed a movie in a web page.

```
<html>
<body>

<video width="640" height="480" controls="controls">
  <source src="movie.mp4" type="video/mp4" />
  Your browser does not support the video tag.
</video>

</body>
</html>
```



- Chimera records movies in H.264 format by default.
- Safari and Chrome and Internet Explorer 9 web browsers will play this.
- Firefox does not play H.264. Encode a second format (Ogg Theora) to play in Firefox without plug-ins.