
Biomovies Documentation

Release 0.5.0

Genís Bayarri, Adam Hospital, Modesto Orozco

Nov 16, 2023

CONTENTS

1 Biomovies	1
1.1 Brief description	1
1.2 Demo	2
1.3 Documentation & help	2
1.4 Software / Hardware requirements	2
1.5 Installation	2
1.6 Features	2
1.7 Technology	3
1.8 Acknowledgements	3
1.9 Copyright & licensing	3
2 Installation	4
2.1 macOS	4
2.1.1 Universal / Intel	4
2.1.2 Apple silicon / ARM64	5
2.2 Ubuntu	5
2.2.1 deb	6
2.2.2 AppImage	6
2.3 Windows	7
3 Getting started	8
3.1 New Project	9
3.2 New Project with Trajectory	9
3.3 Open Project	10
3.4 Import Template	10
3.5 Help	11
3.6 Common shortcuts	11
4 Video Editor	12
4.1 Stage	13
4.1.1 Tools	13
4.1.2 Structure Stage	23
4.2 Timeline	24
4.2.1 Timer	24
4.2.2 Create new timeline item	25
4.2.3 Timeline menu	26
4.2.4 Main structure	30
4.2.5 Descriptions	30
4.2.6 Timeline editor	30
4.2.7 Tips	31

4.3	Representations	31
4.3.1	Keyframes / Clips	34
4.3.2	Trajectories	65
4.3.3	Descriptions	68
4.4	Status Bar	77
4.4.1	Tips	77
4.4.2	Project status	77
4.4.3	Version	77
4.4.4	Theme	78
5	Create Videos	79
5.1	Create New Preview	79
5.2	Create New Movie	80
5.3	Create New GIF	81
6	Utilities	83
6.1	FAQs	83
6.1.1	How easy is to install Biomovies?	83
6.1.2	Which are the software / hardware requirements?	83
6.1.3	How to start a new project?	83
6.1.4	How to edit a movie?	83
6.1.5	How to export my own videos?	83
6.2	Shortcuts	84
6.2.1	Home screen	84
6.2.2	Video Editor	84
6.2.3	Specific Trajectory shortcuts	86
6.3	Tips	86
6.3.1	Stage mouse actions	86
6.3.2	Modify trajectory range	87
6.3.3	Timeline	87
6.3.4	Splitter	87
6.3.5	Theming	87
6.3.6	Show / hide Video Editor areas	88
6.3.7	Hide mouse when recording Preview Video or GIF	89
6.3.8	Use Letterboxing for creating Movies	89

BIOMOVIES



1.1 Brief description

Documentation for **Biomovies**, the **cross-platform** 3D biological structure **video editor**. This cross-platform, open-source software allows the **creation** of **movies** starting from a 3D biological structure file such as a **PDB** or a **MMCIF** file. Additionally, the application **accepts trajectories** coupled with its corresponding topology. The accepted trajectory formats are **NETCDF**, **XTC** and **DCD**.

Thanks to its simplicity and the intuitive interface, users can build videos **easily and quickly**. The application allows the creation of **low resolution** and **HD** videos as well as **animated GIF** images.

The projects can be saved into **.biomovies** files for the sake of **sharing** or **editing** them later. Templates can be **exported** too, allowing to apply the same edition to different biological structures.

Visit the [official website](#) for watching demonstration **videos** and **tutorials**.

1.2 Demo

Visit the [website gallery](#) for seeing demos.

1.3 Documentation & help

All the documentation is accessible through [Read the Docs](#).

1.4 Software / Hardware requirements

- **macOS:** Mac OSX 10.12+ supported, 16GB of RAM recommended
- **Linux:** Ubuntu 18.04 or greater, 16GB of RAM recommended
- **Windows:** Windows 10, 16GB of RAM recommended

1.5 Installation

Please take a look at the [installation section](#) in this same documentation.

1.6 Features

Though we have put all our effort in making **Biomovies** a fully **cross-platform** software, there are a few **minor features** not available in some of the operating systems:

Feature | macOS | Ubuntu | Windows

Create projects | ✓ | ✓ | ✓

Run trajectories | ✓ | ✓ | ✓

Export templates | ✓ | ✓ | ✓

Create preview videos | ✓ | ✓ | ✓

Create HD videos | ✓ | ✓ | ✓

Create animated GIFs | ✓ | ✓ | ✓

Dock menu / JumpList | ✓ | × | ✓

Open recent projects | ✓ | × | ×

1.7 Technology

This project has been built using [Vue JS](#) on top of [Electron JS](#), using the [PrimeVue](#) components library to enhance the user experience.

1.8 Acknowledgements

This project has been developed on top of different JavaScript libraries:

- [NGL viewer: web-based molecular graphics for large complexes](#)
- [NGL Viewer: a web application for molecular visualization](#)
- [FFMPEG WASM](#)
- [Animation Timeline Control](#)

1.9 Copyright & licensing

This software has been developed by the [MMB group](#) at the [IRB Barcelona](#).

© 2023 Institute for Research in Biomedicine

Licensed under the [GPL-3.0 license](#)

INSTALLATION

2.1 macOS

At the moment of launching the current release, the **Biomovies** macOS binaries are **unsigned**. That means that macOS treats them as untrusted software. So, for executing it, please follow the next steps:

- Open the **Finder**.
- Locate the **app** (it might be in the **Applications** folder, or it might still be in your **Downloads** folder).
- **Ctrl-Click or right-click** on the app.
- Select **Open** from the resultant menu and the app will be opened anyway, and an **exception** will be created for opening it normally (i.e. by double-clicking) in future.

If the above steps don't work, here they are the workarounds for make working both the **universal (Intel)** and **Apple silicon (arm64)** version of **Biomovies**:

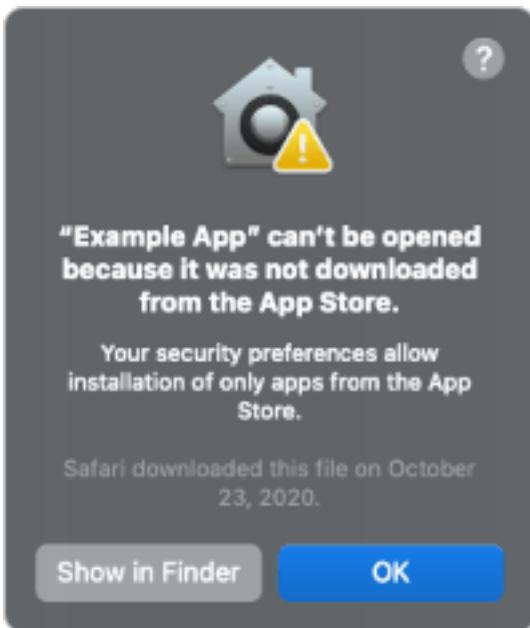
2.1.1 Universal / Intel

A universal binary runs natively on **both Apple silicon and Intel-based Mac** computers, because it contains executable code for both architectures. For downloading the **Universal** version of **Biomovies**, go to the **website download** section and click the *macOS Universal* button. Note that, though this version works as well with an Apple silicon computer, the **ARM64** version is recommended for being more **optimized** for this kind of **architecture**.

Download the **dmg** file, install the application dragging the icon to the **Applications** folder, and, before opening the application, open **Settings > Security and Privacy** and click **Anywhere** under the *Allow apps downloaded from* section:



Note that this option has disappeared from **Mac OS High Sierra** onwards, so in this case, select **App Store and identified developers**. After that, try to open the application and this message will be shown:



Go back to **Settings > Security and Privacy** and, below *App Store and identified developers* a new message will be shown:

“Biomovies” was blocked from opening because it is not from an identified developer

Click the *Open Anyway* button at right and now the application should work.

2.1.2 Apple silicon / ARM64

An **Apple silicon** binary runs only in Apple silicon computers. For downloading the **Apple silicon** version of **Biomovies**, go to the [website download](#) section and click the *macOS Apple Silicon* button.

Download the dmg file, install the application dragging the icon to the Applications folder, and, before opening the application, open the Terminal, **type the following code** and press Enter:

```
xattr -r -d com.apple.quarantine /Applications/biomovies.app
```

Now the application should work properly.

2.2 Ubuntu

For downloading the **Ubuntu** version of **Biomovies**, go to the [website download](#) section and click the *Ubuntu* button (**.deb** and **.AppImage** binaries available). At the moment of launching the current release, there is only a **x64 architecture** binary for **Ubuntu**.

2.2.1 deb

Command line

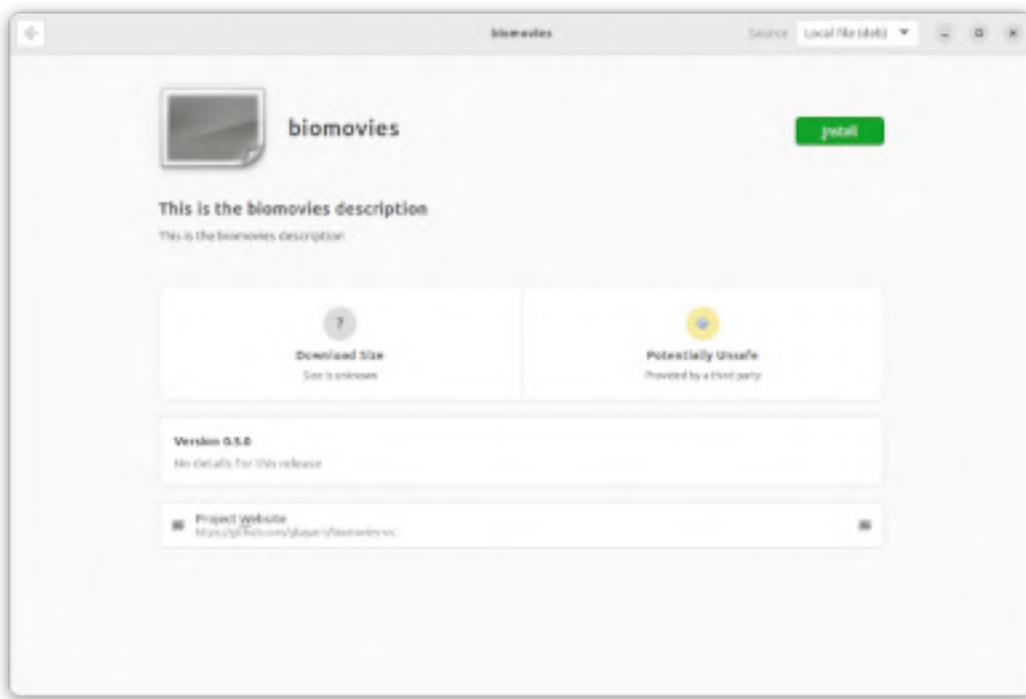
Open the Terminal and **type the following code**:

```
sudo apt install path_to_deb_file
```

Be sure to put the absolute / relative path, not just the file name.

Graphical User Interface

Right click on **.deb** file, select **Open With Other Application** and select **Software Install**. This opens **Ubuntu Software**. Click **Install** button:



Now the application is installed in your computer.

2.2.2 AppImage

First off, be sure to have **FUSE** installed in your computer. If not, please, type on terminal:

```
sudo apt-get install fuse libfuse2 # Ubuntu < 22.04  
sudo apt install libfuse2 # Ubuntu >= 22.04
```

Command line

Open the Terminal and **type the following code**:

```
chmod +x path_to_AppImage_file  
./path_to_AppImage_file
```

Be sure to put the absolute / relative path, not just the file name.

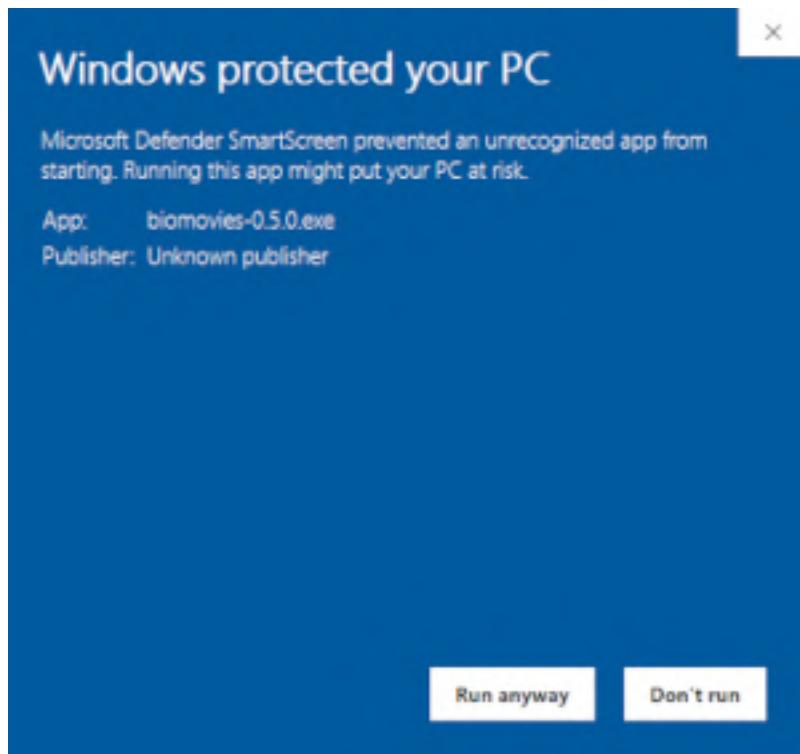
Graphical User Interface

Double click **.AppImage** file.

2.3 Windows

For downloading the **Windows** version of **Biomovies**, go to the [website download](#) section and click the *Windows* button. At the moment of launching the current release, there is only a **x64 architecture** binary for **Windows**.

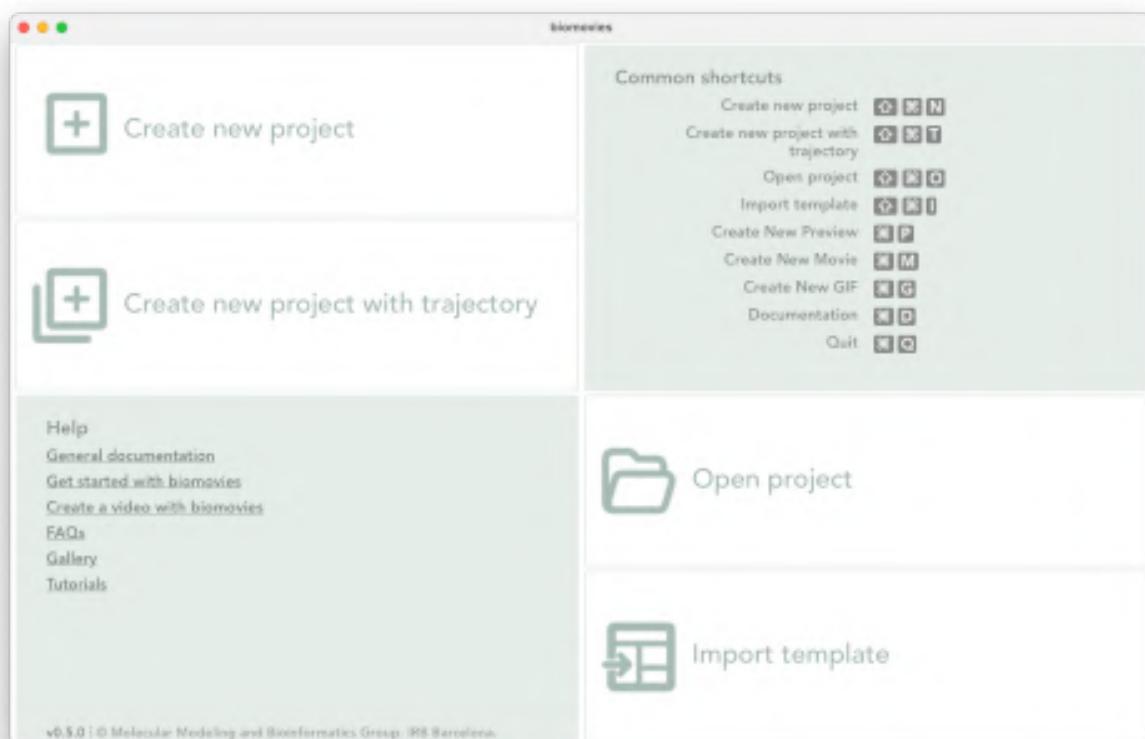
Windows treats the **Biomovies** executable file as an unrecognized app. So, after double clicking the **.exe** file, Windows will open the following window:



Click on *More info* and then, on *Run anyway* button for starting the installation.

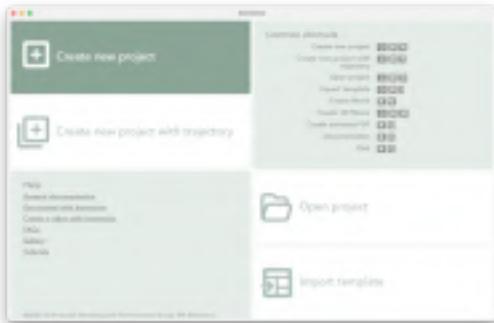
CHAPTER THREE

GETTING STARTED



Application home screen

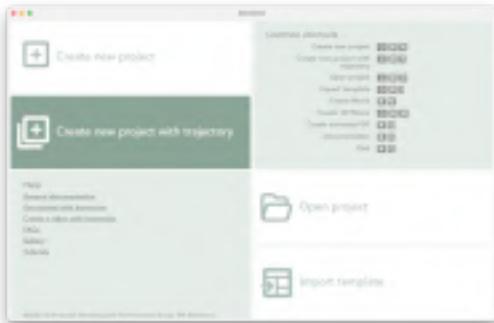
3.1 New Project



Creating a new project with **Biomovies** is as easy as clicking the *Create new project* button (or via menu: *Project > New Project*) and selecting a 3D biological structure file (in **PDB** or **MMCIF** format) from the user's computer.

Shortcut: **⌘/Ctrl + ⌘ + N**

3.2 New Project with Trajectory



The process of creating a new project with a **trajectory** starts by clicking the *Create new project with trajectory* button (or via menu: *Project > New Project with Trajectory*) and selecting a 3D biological structure file (in **PDB** or **MMCIF** format) as a topology and its corresponding trajectory (in **NETCDF**, **XTC** or **DCD** format) from the user's computer. Note that both files must be selected at the **same time**, so it's recommended to have them in the **same folder** at the time of creating the new project.

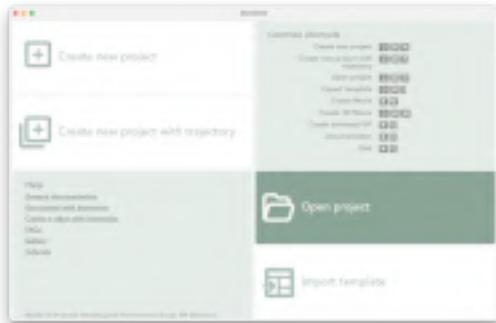
Be aware that, if the **trajectory** doesn't fit the **topology**, **errors** will happen in the representation of the structure. It is very important too that the trajectory is **well created** and **tested** with its corresponding topology in a visualization program such as **VMD**.

Take into account that, depending on the **trajectory size** and the **memory** of the computer, the loading process can take a while. Consider as well that, if the trajectory is big and the project is saved in a **.biomovies** file, this file will contain the trajectory along with the topology. So, consequently, the **final size** of the project file will be **big** as well.

In those cases it can be worth considering exporting the project **as a template** instead of saving it as a project. A **template** only saves the project information (but not the structure and the trajectory) and, therefore, the **file size** is really **small**.

Shortcut: **⌘/Ctrl + ⌘ + T**

3.3 Open Project

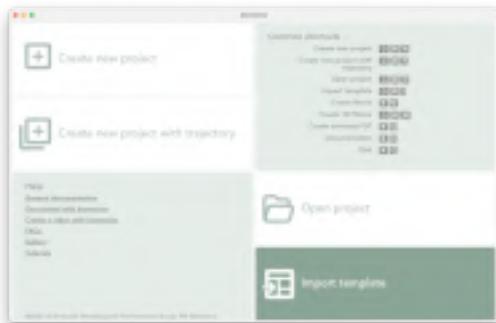


Just click the *Open project* button (or via menu: *Project > Open Project* or *Project > Open Recent*) and select a **.biomovies** file from the user's computer. A **.biomovies** file contains all the necessary information of the project, including the **3D structure** file and the **trajectory** file (if necessary).

Recent projects can be opened as well from the **JumpList** in **Windows** and from the **Application dock menu** in **macOS**.

Shortcut: **⌘/Ctrl + ⌘ + O**

3.4 Import Template



Templates are a very interesting option for applying the **same video edition** to **different structures**. They are worth considering too for sharing a project, since a **template** only saves the project information (but not the structure and the trajectory) and, therefore, the **file size** is really **small**.

Clicking the *Import template* button (or via menu: *Project > Import Template*) will ask to select a **.tbiomovies** file from the user's computer. As the **.tbiomovies** file only contains the necessary information to create a new project but **not** the **3D structure** file and the **trajectory** file (if necessary), after loading it, a new dialog window will ask for this **3D structure** file and the **trajectory** file (if it is a trajectory template). After these two steps, a **new project** is created applying the **actions** of the template on the new **3D structure** (and the **trajectory** if provided).

Shortcut: **⌘ + ⌘ + I** for **macOS**, **Ctrl + Alt + I** for **Windows / Ubuntu**

3.5 Help

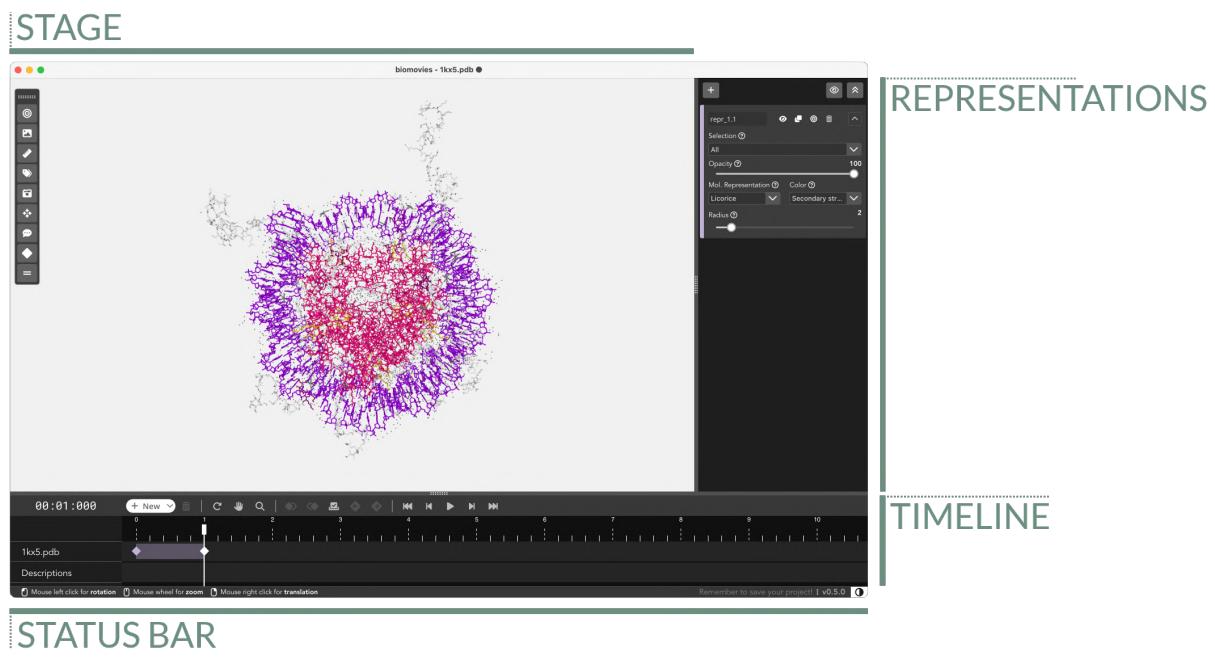
A broad documentation has been written and is available in this same *Read the Docs*. Besides, there are several video examples available in the [Gallery](#) as well as some [Tutorials](#) in the [official website](#).

3.6 Common shortcuts

When launching the application, a list of **common shortcuts** is shown (see figure *Application home screen* in this same section). However, a list with all the shortcuts available can be found in the [Utilities](#) section.

CHAPTER
FOUR

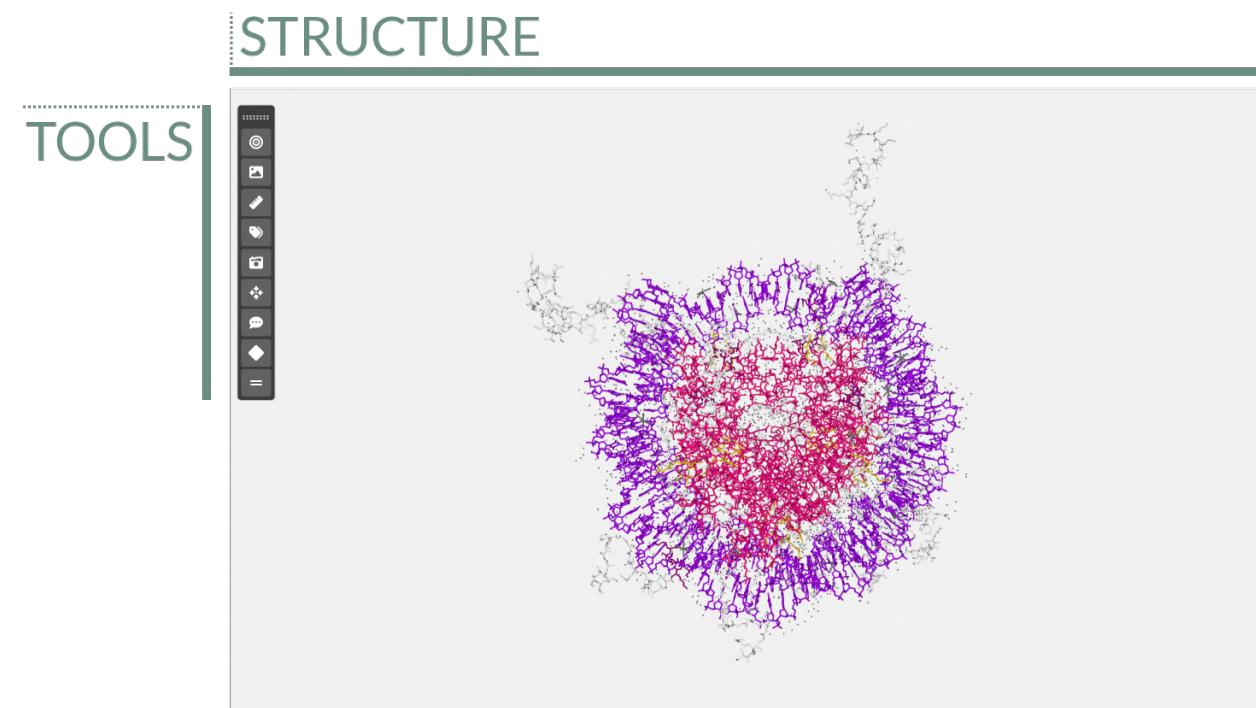
VIDEO EDITOR



STATUS BAR

Video Editor

4.1 Stage



The **stage** is the area where the 3D biological structure is represented, the **tools bar** allows to apply actions to the stage.

4.1.1 Tools

The tools menu is at the top left of the **stage** and allows users to make some actions over it.



This menu is **draggable** around all the stage and can be **collapsed / expanded** by clicking twice on the handler. For **hiding** it completely, go to *View > Tools* in the menu. Click in the same menu for **showing** it again.

Center

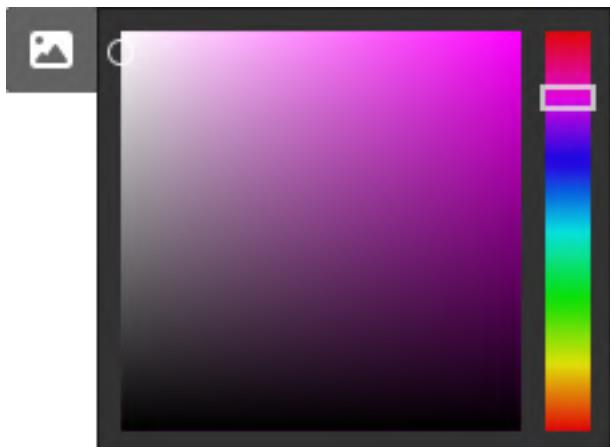


Clicking this button **centers** the structure(s) position on the **stage**. This button is active only if **one single keyframe** of the timeline has been selected.

Background



Clicking this button opens a **color picker** that allows users to change the **background color** of the stage.



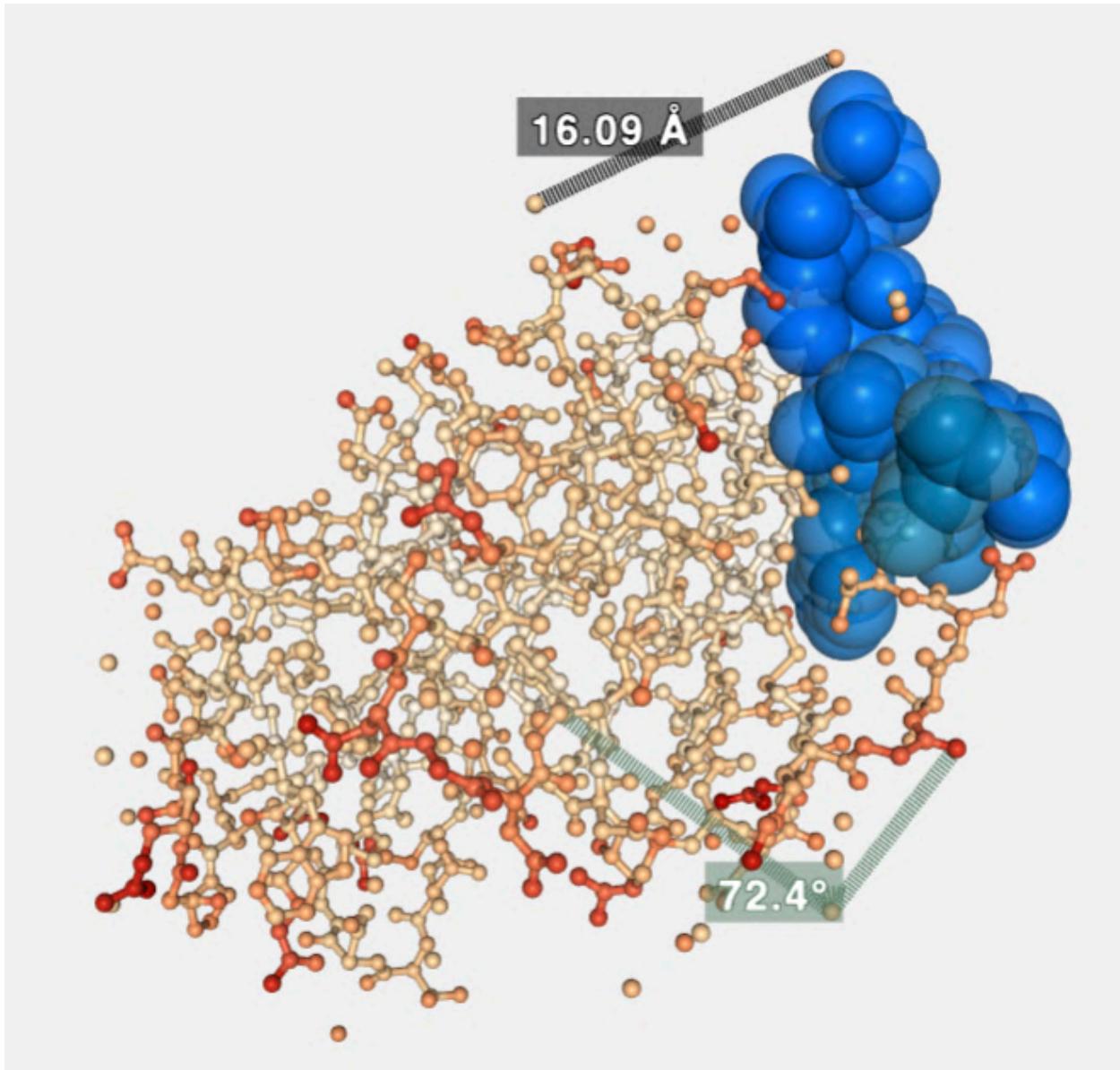
Click **again** on the button for **hiding** the color picker.

Measurements



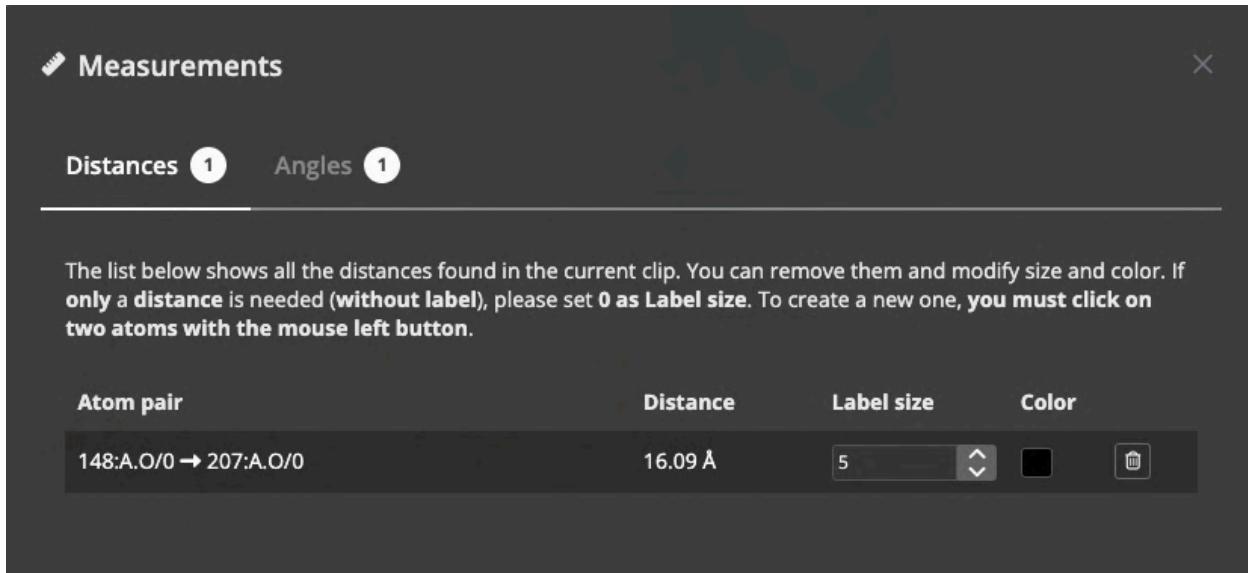
Clicking this button **opens a modal dialog** to edit the **distances and angles** created by users in the stage. For remembering how to draw them, please go to the [**Mouse click actions section**](#).

Measurements with size and color by **default**:

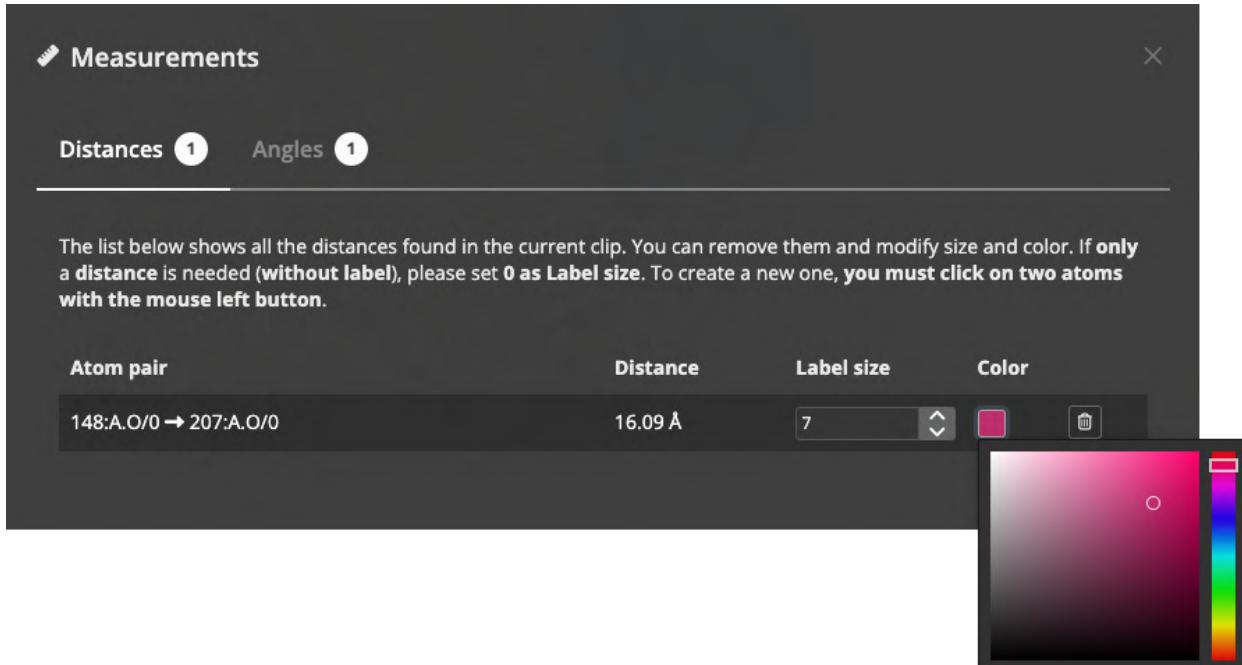


Distances

Distances editor before editing size and color:



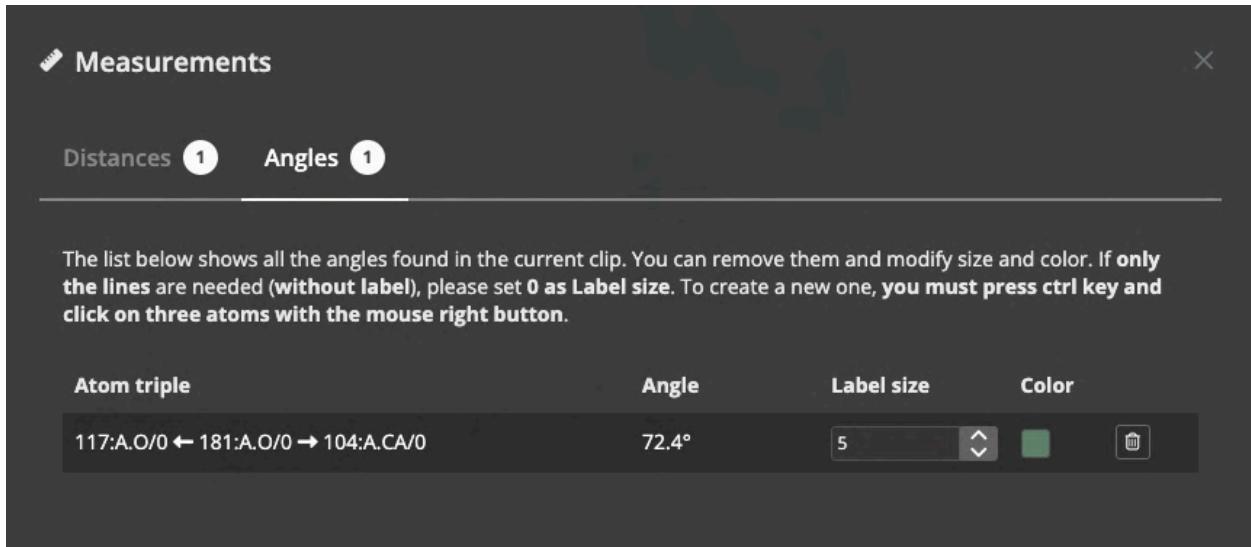
Distances editor after editing size and color:



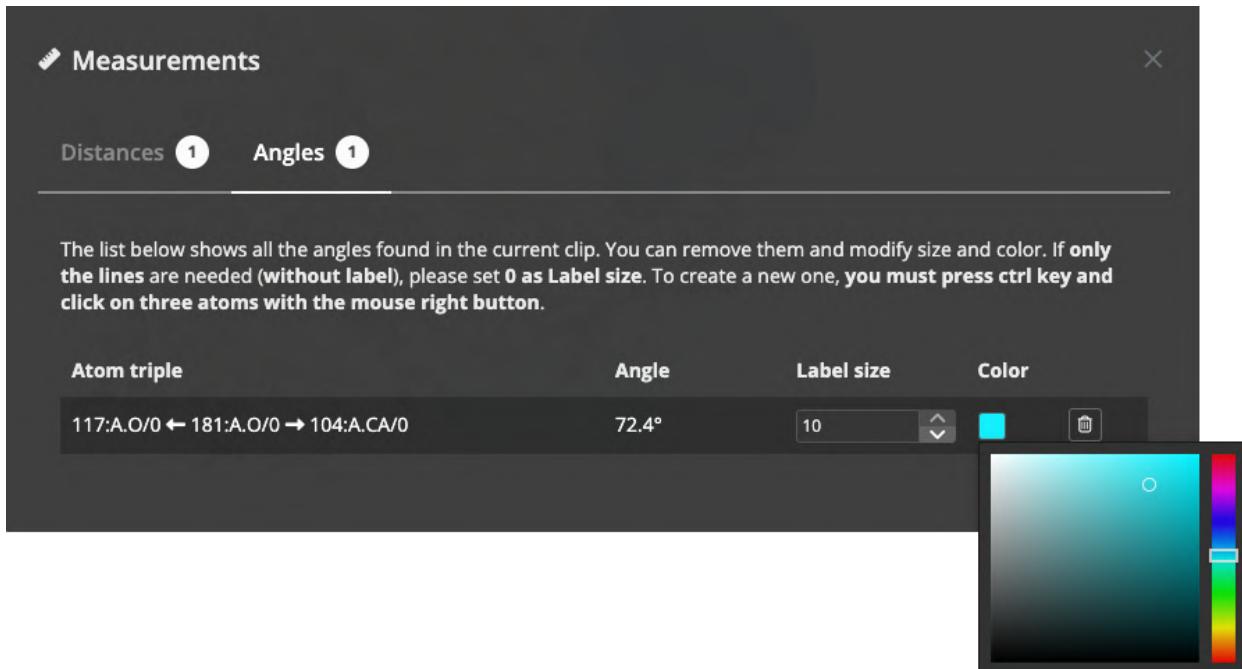
If **only a distance** is needed (**without label**), please set **0 as Label size**.

Angles

Angles editor before editing size and color:

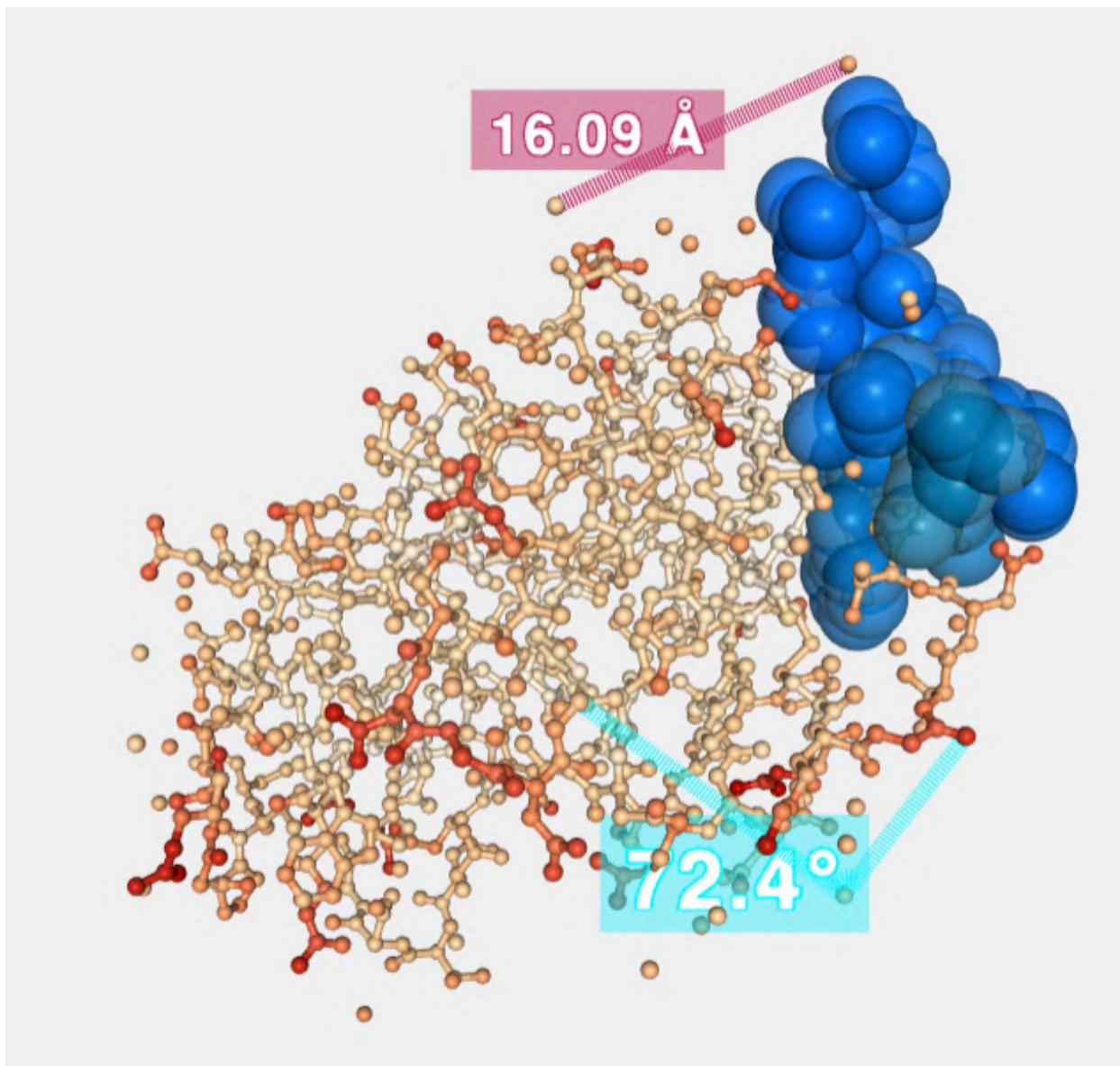


Angles editor after editing size and color:



If **only the lines** are needed (**without label**), please set **0 as Label size**.

Measurements after size and color edition:

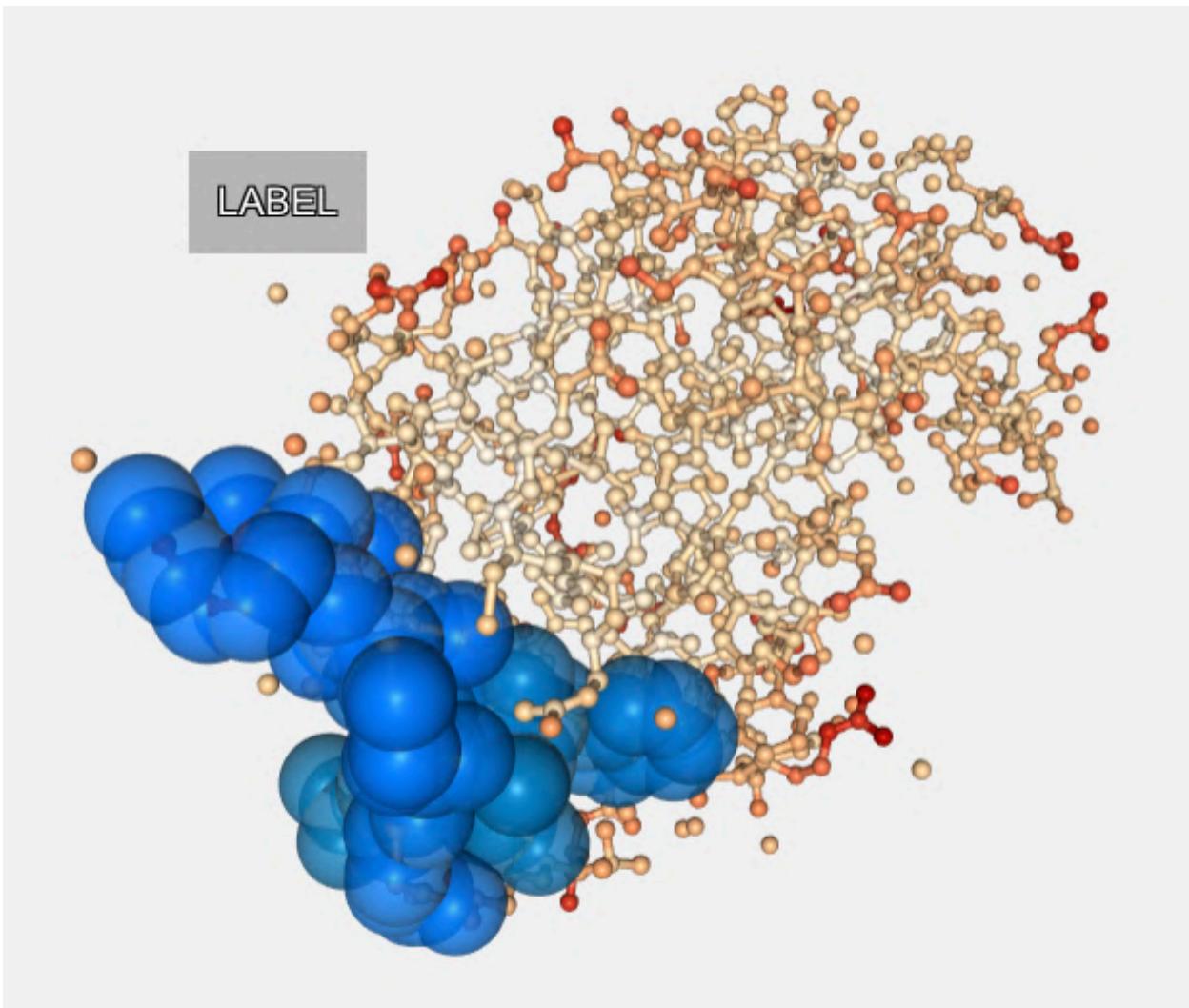


Labels

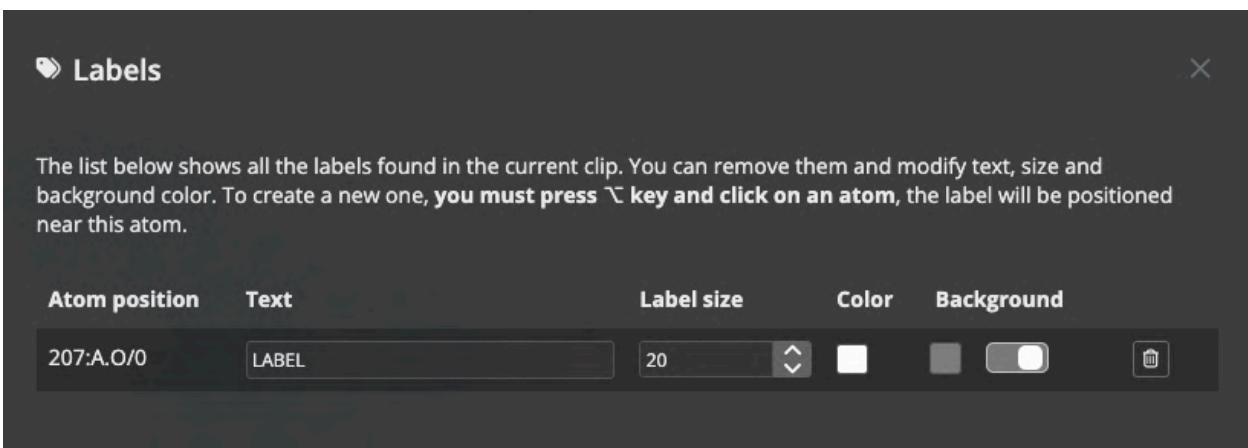


Clicking this button **opens a modal dialog** to edit the **labels** created by users in the stage. For remembering how to draw them, please go to the [Mouse click actions section](#).

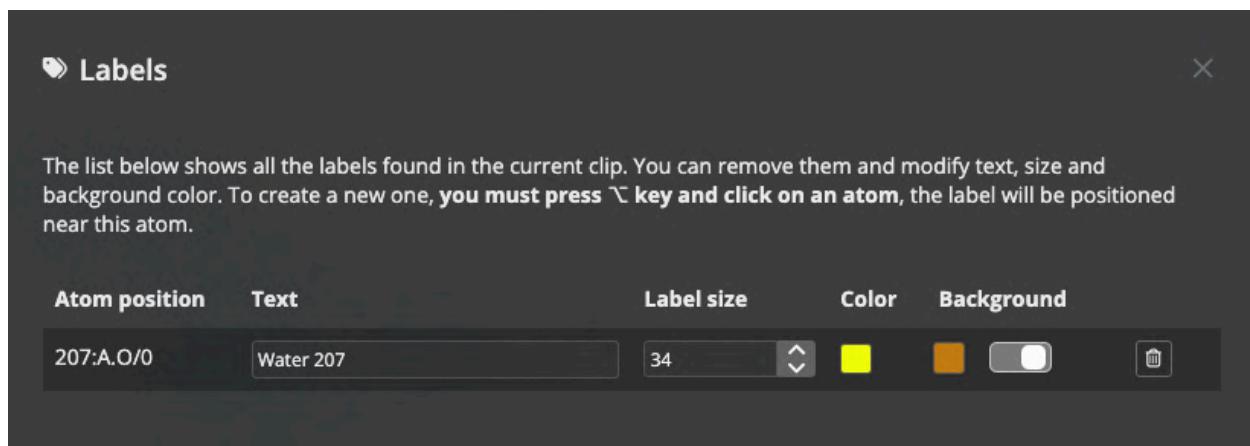
Labels with size, text and color **by default**:



Labels editor before editing text, size color and background:

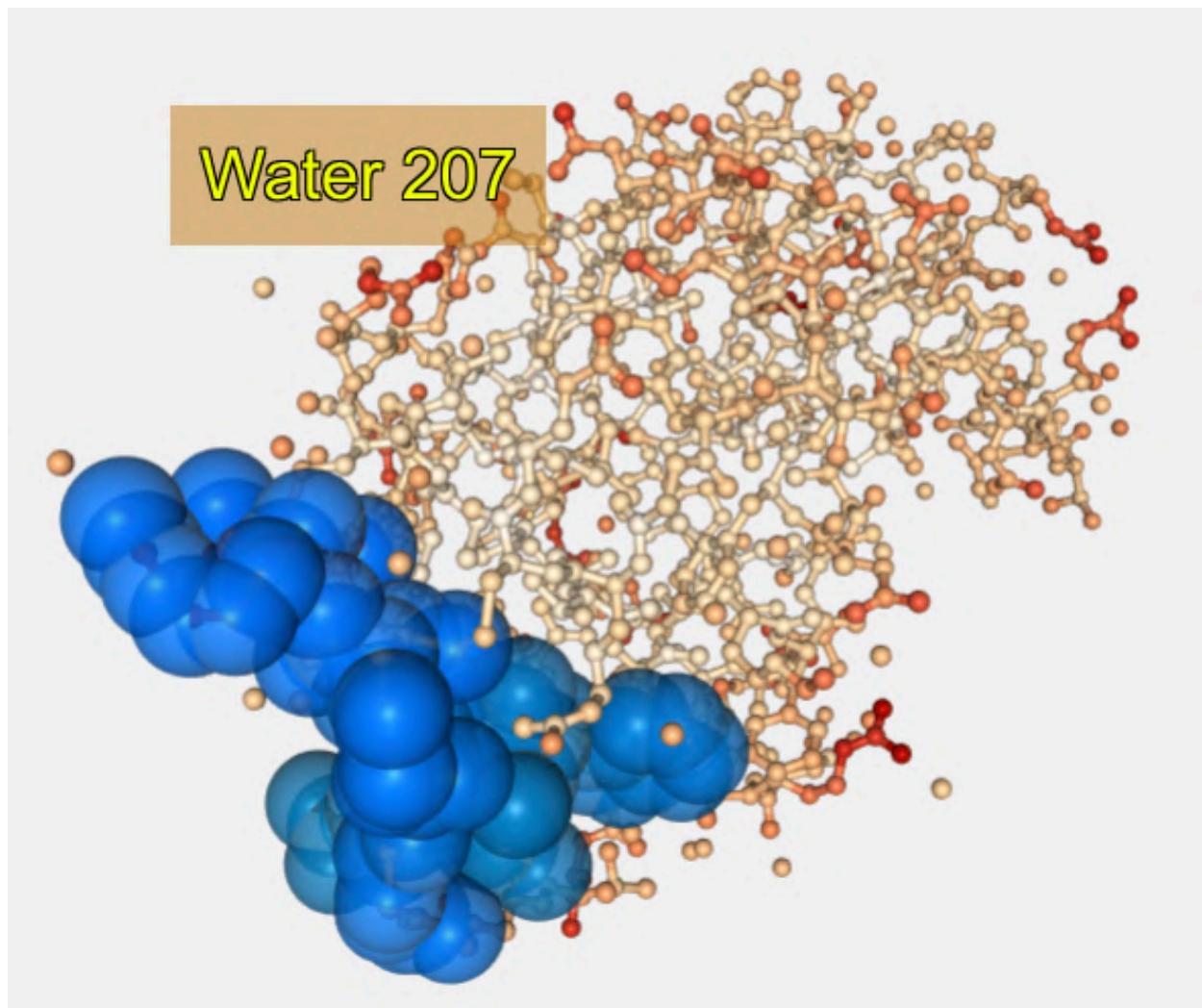


Labels editor after editing text, size color and background:



Label **background** can be modified. Moreover, it can be **disabled** as well with the switch beside the background color selector.

Labels after size, text and color edition:



Camera type



Switches camera type between **orthographic** and **perspective**.

Center view in atom



Click this button and then, **select an atom** of the structure, the view will be **focused** into this atom position. This button is active only if **one single keyframe** of the timeline has been selected.

Enable / Disable legend



Enables / disables a **legend** on the bottom right of the **stage**. This **legend** shows information for the molecule the mouse has hovered over in the next format:

Model number | Chain ID | Residue name (Residue long name) Residue number Atom name (or Bond)

Model 1 | Chain A | ARG (arginine) 112 CB-CG

Open keyframe editor



Clicking this button **opens a keyframe editor**.



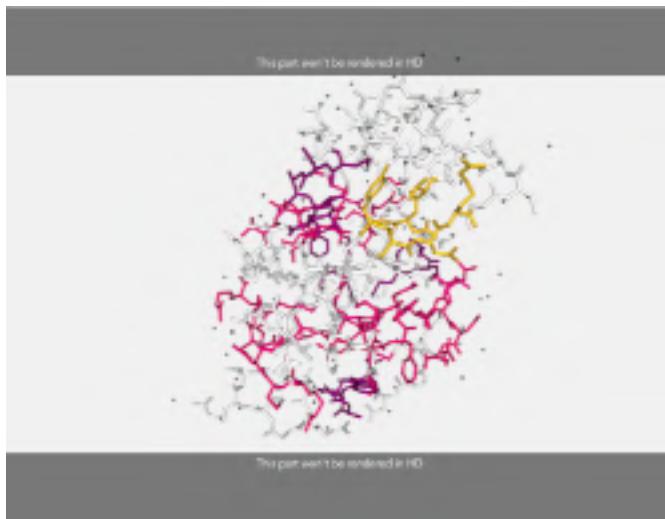
In this editor, users can change the **rotation** and **translation** of the biological structure.

This button is active only if **one single keyframe** of the timeline has been selected.

Enable / Disable letterboxing

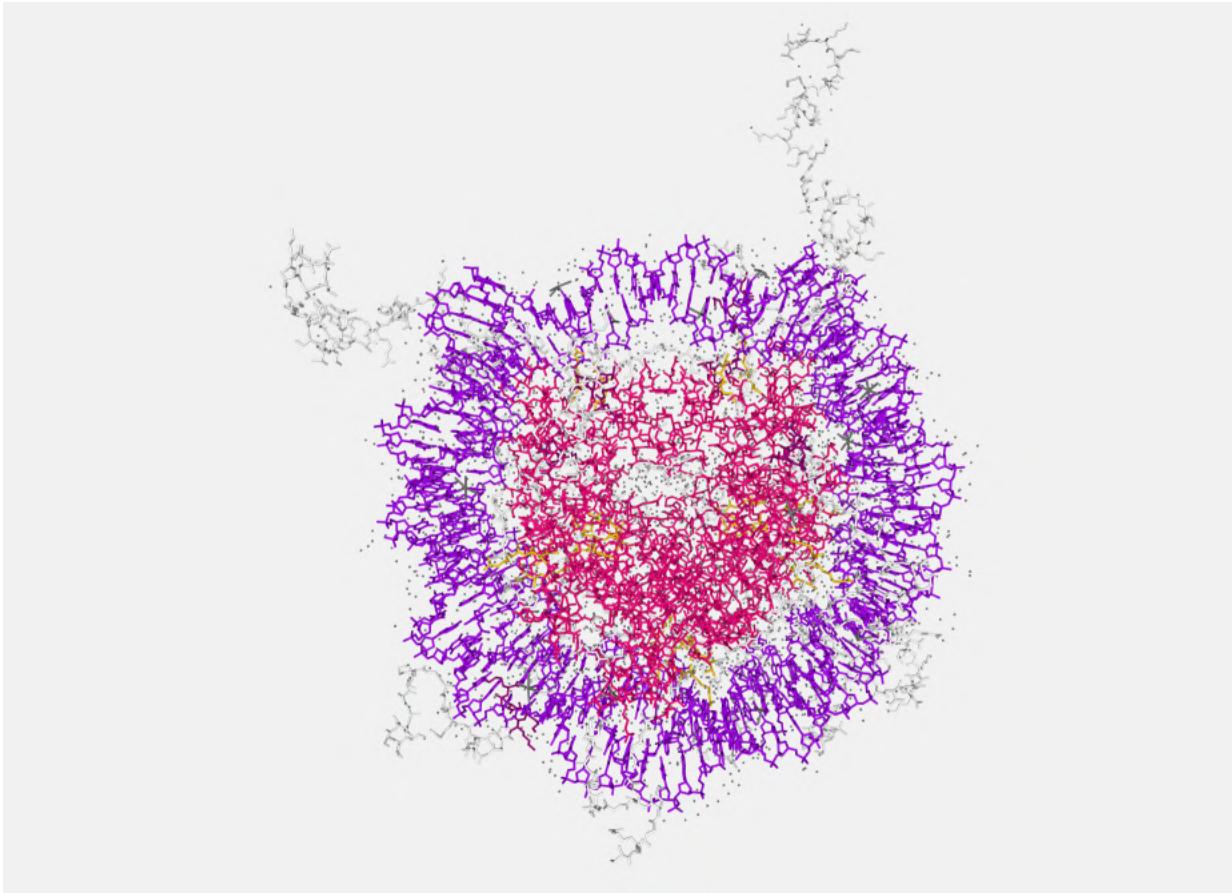


Enables / disables letterboxing on the **stage**. Two **stripes** will appear showing to the user which parts of the stage will be **rendered** and which not in case of [Creating a New Movie](#). In some cases (when the screen **aspect ratio** is **16:9**) these stripes won't appear.



Click **again** on the button for **removing** the stripes from the stage.

4.1.2 Structure Stage



The **stage** covers the main part of the screen. In the stage the **structure is loaded** and **represented**, and users can interact with it in several ways.

Zoom / Drag

Before applying **rotation**, **translation** or **zoom** to the stage, a *keyframe must be selected in the timeline*.

Actions of **zoom in** and **zoom out** can be done with the **scroll mouse or the trackpad** of a laptop, besides, **rotation** and **translation** can be applied as well:

- Clicking on the stage with the **left button** and **dragging will rotate the view**.
- Clicking on the stage with the **right button** and **dragging will translate the view**.
- Mouse wheel (or using the trackpad with two fingers) on the stage will **zoom in** or **zoom out**.

All these modifications in the **general orientation** of the structure will be applied to the **selected keyframe**. That means that, in a **clip**, the **first** and the **last frame** can have different **rotation**, **translation** or **zoom**. Biomovies will take care of the **interpolation** between frames.

Mouse actions

Mouse over actions

Passing the mouse over the molecules of the structure will **highlight** them and show **their information** in the **legend** on the bottom right of the stage. [Click here](#) to see how to enable the legend.

Mouse click actions

- Clicking with the mouse **left button** on an atom while pressing the **Alt or Esc** key will **place a Label** close to this atom. [Click here](#) to see how to edit labels.
- Clicking **consecutively on two atoms** with the mouse **left button** will draw and calculate the **distance** in **ångströms** between these two atoms. [Click here](#) to see how to edit distances.
- Clicking **consecutively on three atoms** with the mouse **right button** while pressing the **Ctrl key** will draw and calculate the **angle** in **degrees** between these three atoms. [Click here](#) to see how to edit angles.

4.2 Timeline



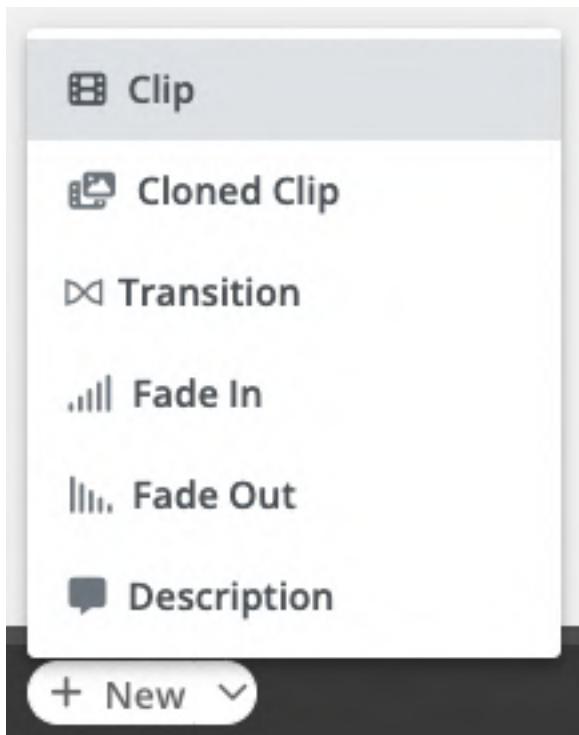
The **Timeline**, placed at the bottom part of the application, allows the users to control and edit the **clips** and the **keyframes** that shape the representation.

4.2.1 Timer



Placed at the top left corner of the **Timeline**, indicates the **exact time** where the cursor is.

4.2.2 Create new timeline item



This menu allows to **create new items** in the timeline:

Clip

Creates a **new clip** in the timeline. Note that for creating a new clip an existing one must be selected. The new clip will be added **after this selected clip**. If there is not enough space, the new clip will be added at **the end of the timeline**.

Shortcut: ⌘/Ctrl + ⌘ + C

Cloned Clip

Clones an **existing clip** from the timeline. Note that for cloning a new clip an existing one must be **already selected** in order to clone it. The new clip will be added **after this selected clip**. If there is not enough space, the new clip will be added at **the end of the timeline**.

Shortcut: ⌘/Ctrl + ⌘/Alt + C

Transition

Creates a **transition between two clips**. Two **consecutive keyframes** of **different clips** with a minimum gap of 400ms between them must be selected before performing this action.

Shortcut: ⌘/Ctrl + ⌘ + T

Fade In

Creates a **Fade In transition before a clip**. The **initial keyframe** of the clip must be selected before performing this action. There must be a minimum gap of 480ms between the previous keyframe and the one selected.

Shortcut: **⌘ + ⌘ + I** for **macOS**, **Ctrl + Alt + I** for **Windows / Ubuntu**

Fade Out

Creates a **Fade Out transition after a clip**. The **final keyframe** of the clip must be selected before performing this action. There must be a minimum gap of 480ms between the next keyframe and the one selected.

Shortcut: **⌘/Ctrl + ⌘ + O**

Description

Creates a new **description** in the timeline.

Shortcut: **⌘/Ctrl + ⌘ + D**

4.2.3 Timeline menu



In this **menu**, divided into **four areas**, there can be found all the possible actions to apply to the **Timeline**.

Remove



The remove button allows the user to **remove** the selected **clip** or **transition**. For the sake of security, the button must be **clicked twice**.

Timeline controls



This submenu has the actions for controlling the **Timeline** area.

Reset timeline



Clicking this button **resets** the **Timeline editor**: disables the **Pan Mode** (if enabled), resets the **Zoom** to the initial value (if changed) and moves the **cursor** to the beginning.

Shortcut: **⌘/Ctrl + ⌘/Alt + R**

Pan mode



Clicking this button enables / disables the **Pan Mode**, which allows to **drag the whole Timeline editor**.

Shortcut: **⌘/Ctrl + ⌘/Alt + A**

Zoom



Clicking this button enables / disables the **Zoom Mode**, which allows to **zoom into the Timeline editor**.

Shortcut: **⌘/Ctrl + ⌘/Alt + Z**

Tips: Once the zoom mode is enabled, the **default** zoom type is **Zoom In**. For doing **Zoom Out**, click **⌃/Ctrl**. Zoom can be applied as well just clicking **Ctrl** (any OS) and scrolling the **mouse wheel**.

Keyframes actions



This submenu has the actions for controlling the **keyframes** of the **Timeline**.

Align last keyframe



Only works with **two keyframes** selected: aligns the **last** keyframe of the selection with the **first** one.

Shortcut: **⌘/Ctrl + ⌘/Alt + ⌂ + ⌄ / Left for macOS / Windows, Ctrl + Left for Ubuntu**

Align first keyframe



Only works with **two keyframes** selected: aligns the **first** keyframe of the selection with the **last** one.

Shortcut: $\text{⌘/Ctrl} + \text{↖/Alt} + \text{↑} + \text{▶}$ / Right for **macOS / Windows**, $\text{Ctrl} + \text{Right}$ for **Ubuntu**

Select all keyframes



Clicking this button select **all the keyframes of the Timeline editor**.

Shortcut: $\text{⌘/Ctrl} + \text{↑} + \text{K}$

Move keyframes left



Only works with **two or more keyframes** selected: moves **all the selected keyframes to left** in the **Timeline editor**.

Shortcut: $\text{⌘/Ctrl} + \text{↑} + \text{◀}$ / Left

Move keyframes right



Only works with **two or more keyframes** selected: moves **all the selected keyframes to right** in the **Timeline editor**.

Shortcut: $\text{⌘/Ctrl} + \text{↑} + \text{▶}$ / Right

Player



This submenu has the actions for controlling the **cursor** of the **Timeline**.

Go to first frame



Clicking this button moves the **cursor** to the **first frame** of the **Timeline**.

Shortcut: $\hat{U} + \blacktriangle / \text{Up}$

Go to previous frame



Clicking this button moves the **cursor** to the **previous frame** in the **Timeline**.

Shortcut: $\hat{U} + \blacktriangleleft / \text{Left}$

Play / Pause



Clicking this button **plays / pauses the Timeline**.

Shortcut: $\hat{U} + P$

Go to next frame



Clicking this button moves the **cursor** to the **next frame** in the **Timeline**.

Shortcut: $\hat{U} + \blacktriangleright / \text{Right}$

Go to last frame



Clicking this button moves the **cursor** to the **last frame** of the **Timeline**.

Shortcut: $\hat{U} + \blacktriangledown / \text{Down}$

Trajectory frames

3792 / 10000 [3602 - 6563]

Only when working with a **trajectory**, this section appears at the top right corner of the **Timeline**. It indicates in the first place the **position of the cursor** and the **total frames** of the trajectory, and in the second place, between brackets, the **range of frames** with which the trajectory will be played. [Click here](#) to see how to select this range in the **Trajectory editor**. So, in the above image, the cursor is in the frame number 3792 of a total of 10000 for the whole trajectory, but only the frames between the 3602 and the 6563 will be played.

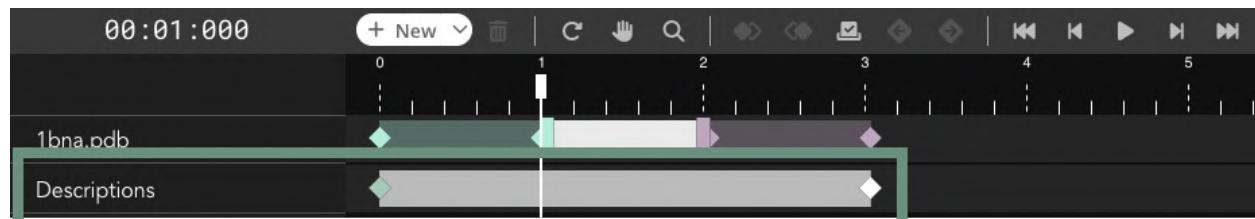
Cursor / Total frames [initial range frame - final range frame]

4.2.4 Main structure



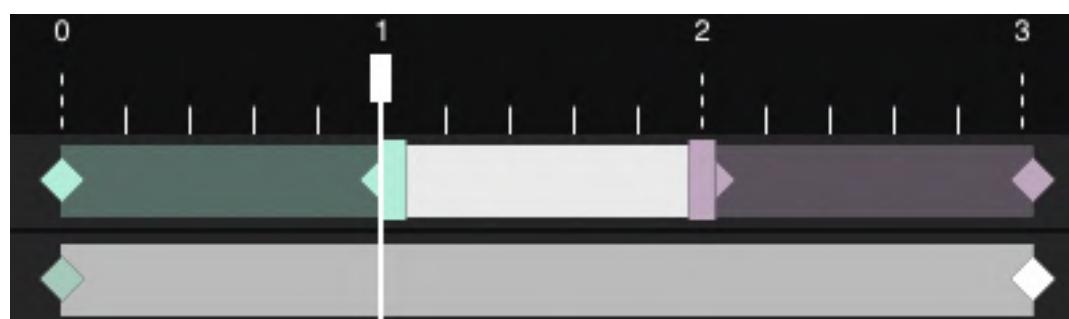
In the first row of the **Timeline**, the **main structure** can be edited creating / modifying new **clips** and **transitions**.

4.2.5 Descriptions



In the second row of the **Timeline**, **Descriptions** can be introduced. They can be treated and edited as **clips** with their corresponding **keyframes**.

4.2.6 Timeline editor



The main timeline area or editor, is the place where all the actions related to **Timeline** such as select **clip / transition**, **move** them, select **keyframes** and so on.

4.2.7 Tips

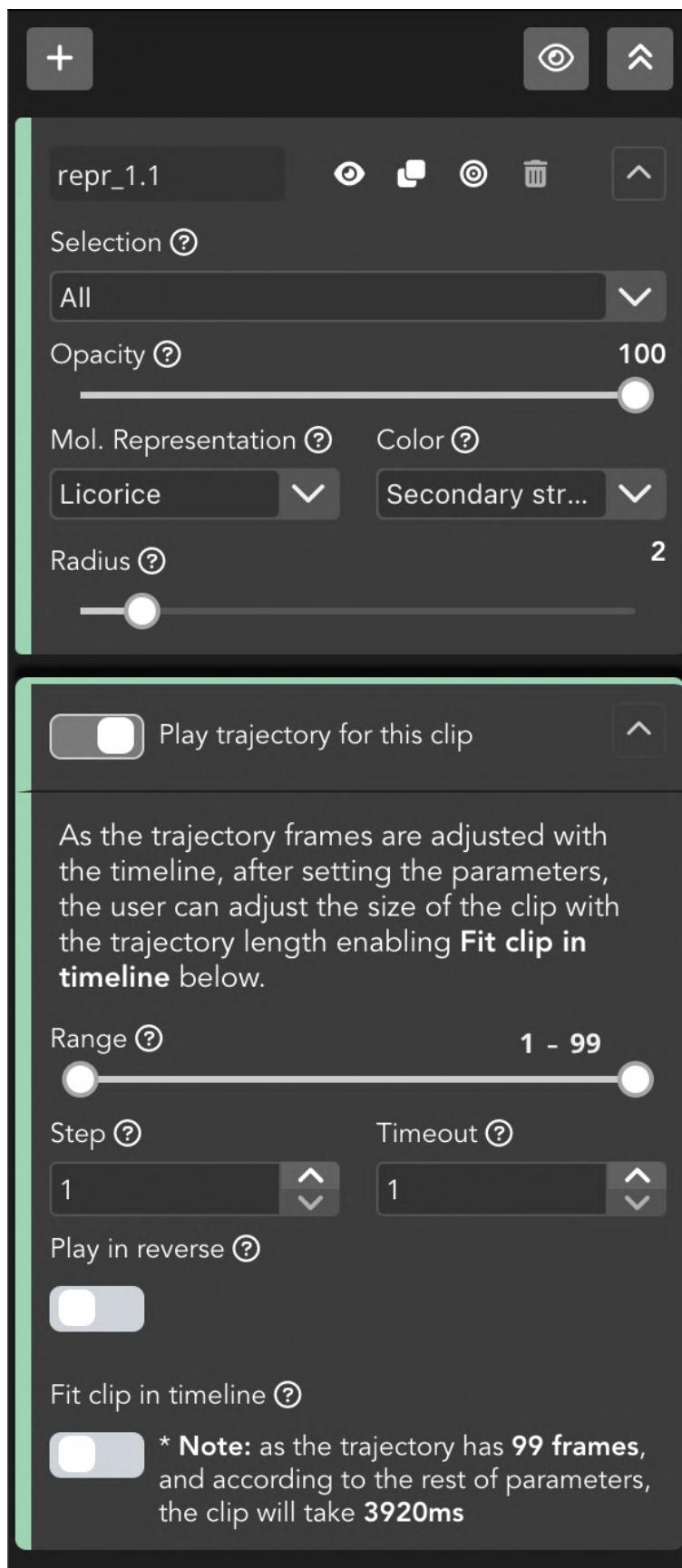
- For **selecting a clip**, click with the **left mouse** button on the clip clicking **Ctrl** (for any OS) at the same time.
- The timeline **zoom** can also be applied via **scroll mouse** or **trackpad** and pressing the **Ctrl** key at the **same time**.
- **Multiple keyframes** can be selected just **clicking** and **dragging** over the **Timeline Editor**.

For more tips, see the [*tips section*](#).

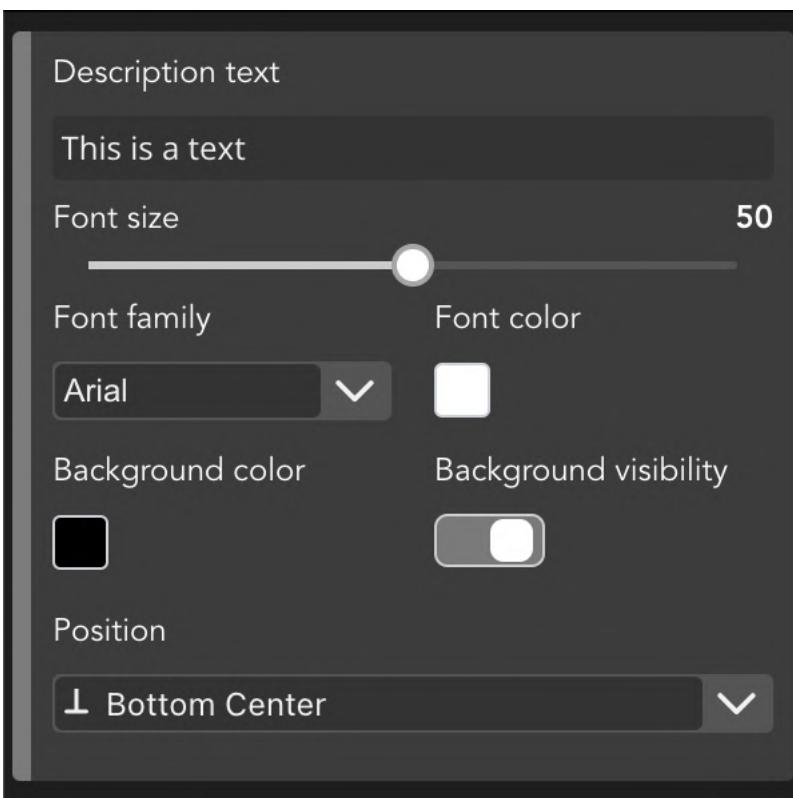
4.3 Representations

The **Representations** panel is located at right of the stage and is used for:

- Changing the **representation** properties of the **structure** *selecting a clip or a keyframe* in the **Timeline**. That means that **each clip** can have different **representations**.
- Modifying the **settings** of a trajectory for each *selected clip or keyframe* in the **Timeline**. That means that the **trajectory** can have different **settings** for **each clip**.
- Adjusting the features for each *selected description text* in the **Timeline**. That means that **each description** text can have different **features**.

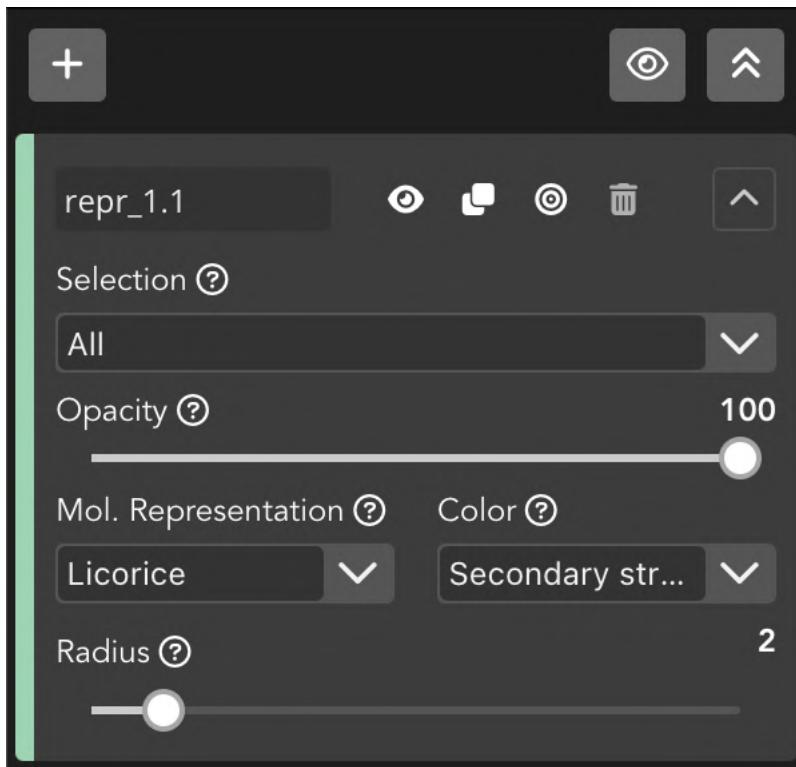


Representations for clips and Trajectory settings



Description settings

4.3.1 Keyframes / Clips



When *selecting a clip or a keyframe* in the **Timeline**, the above **editor** module appears on the **Representations** area.

Menu

This menu is **common** for all the representations of the selected **clip**.

Create new representation



Clicking this button will create a **new representation** for the **structure** in the **selected clip**.

Hide all



Clicking this button will **hide** in the stage **all the representations** for the **structure** in the **selected clip**.

Collapse all



Clicking this button will collapse **all the representations editor** modules for the **structure** in the **selected clip**. It doesn't affect the representation.

Edit representation

Each time we click the *Create new representation* a **new representation** is created and, therefore, a new **Edit representation module** is added. Each one of these **representations** are applied to the **selected clip**. For applying **different representations** to a different **clip**, click on this other **clip** in the **Timeline**.

Representation menu



The first line of the editor holds several **actions** related with the **representation**.

Representation name



Clicking this box allows to **edit the name** of the **representation**.

Hide representation



Clicking this button will **hide** this **representation** in the **stage**.

Clone representation



Clicking this button will **clone** this **representation**.

Center in this representation



Clicking this button will **center** the stage view in the molecules selected in this **representation**.

Remove representation



Clicking this button will **remove** completely this **representation**.

Collapse representation editor



Clicking this button will collapse this **representation** editor. It doesn't affect the representation.

Selection

The **Selections** are used for applying **molecular selections** to the selected **representation**.

Standard selection

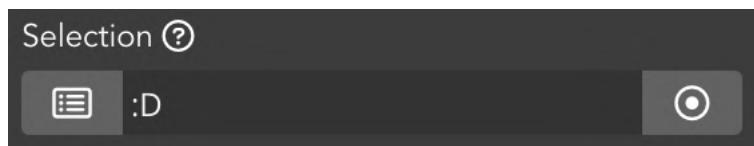
By default, **Biomovies** provide a list of predefined selections:

- All
- Side Chain
- Side Chain Attached
- Backbone
- Protein
- Nucleic
- RNA
- DNA
- Hetero
- Ligand
- Ion
- Saccharide / Sugar
- Polymer
- Water
- Hydrogen

- Helix
- Sheet
- Turn
- Small
- Nucleophilic
- Hydrophobic
- Aromatic
- Amid
- Acidic
- Basic
- Charged
- Polar
- Non Polar
- Cyclic
- Aliphatic
- Bonded
- Ring

Custom selection

Additionally, a **custom selection** is provided as well. When selected, the dropdown menu described below changes to a **new structure**:



The custom selection is divided into three sections:

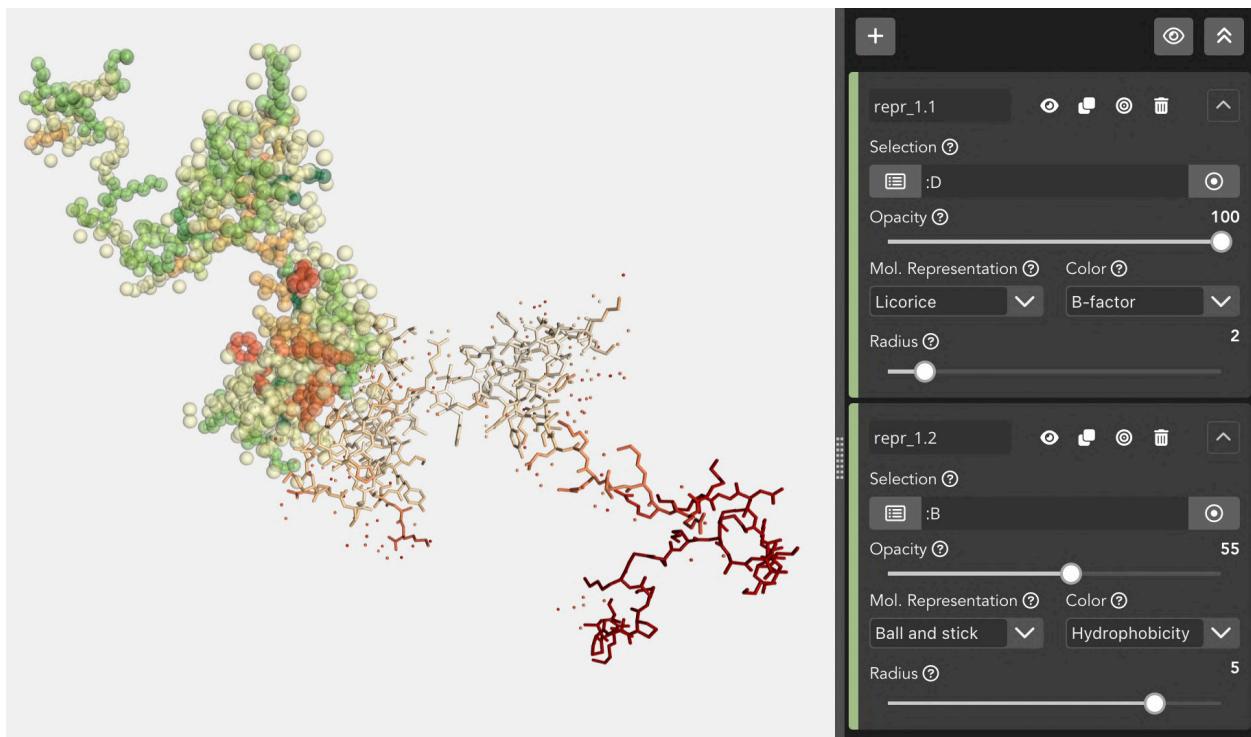
Back to standard selection button



Clicking this button backs to the **dropdown menu** with the list of **predefined selections**.

Selection input text

In this text field, users can add a custom selection written in **NGL viewer Selection Language**. Please visit the **Selection language section** of the NGL Viewer manual **before starting** with this section.

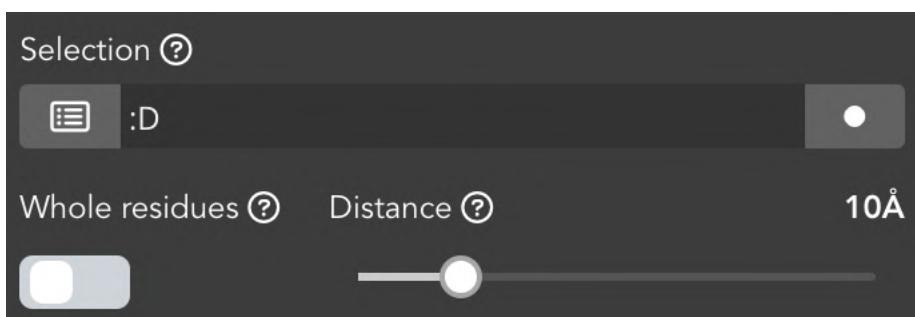


Two different chains selected via custom selection

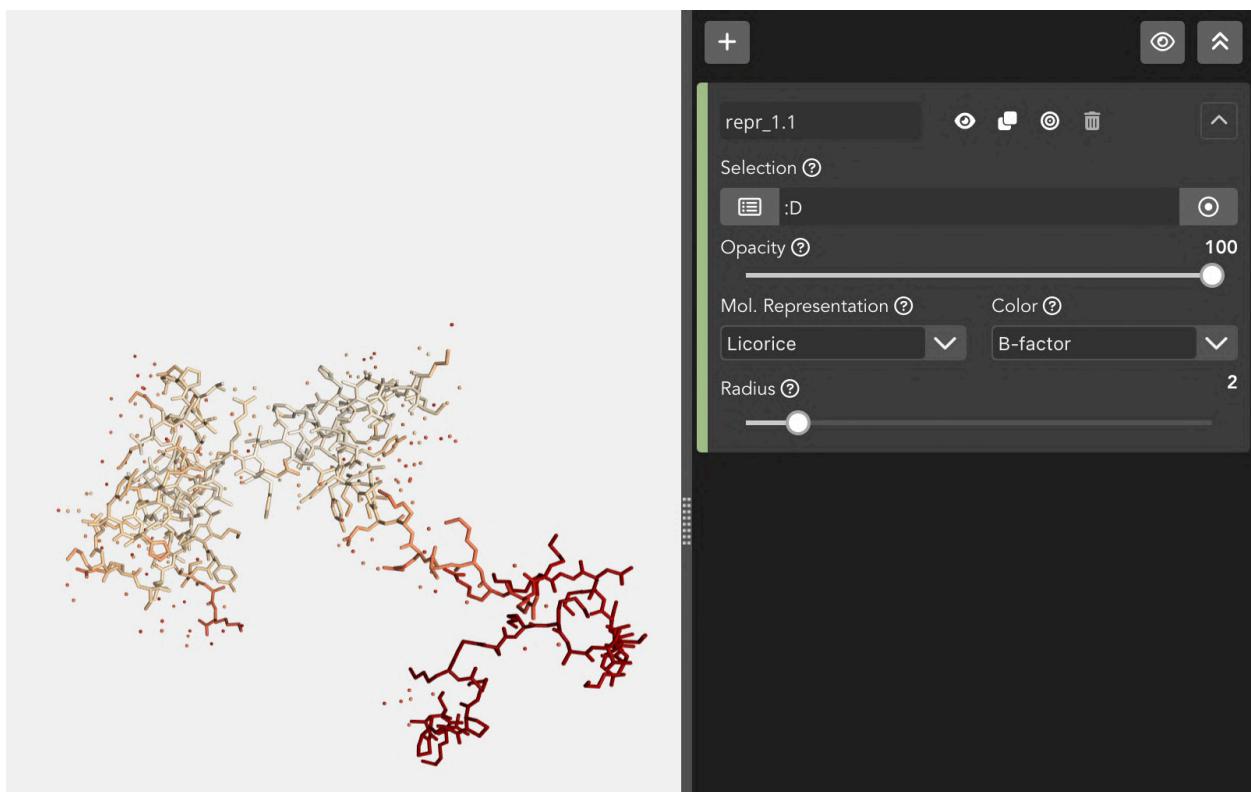
Distance-based selection button



When clicked, gets the atoms that are within a certain distance of the selection.

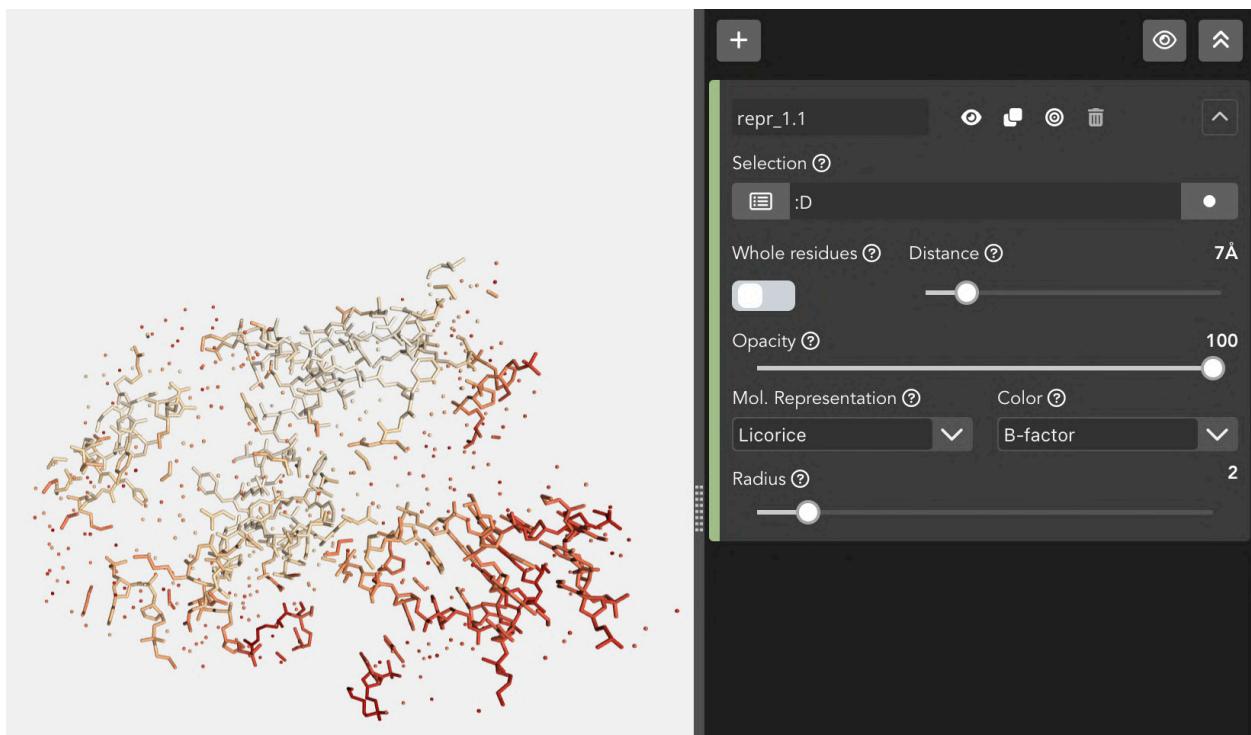


It adds two new fields as well: **Whole residues** and **Distance**.



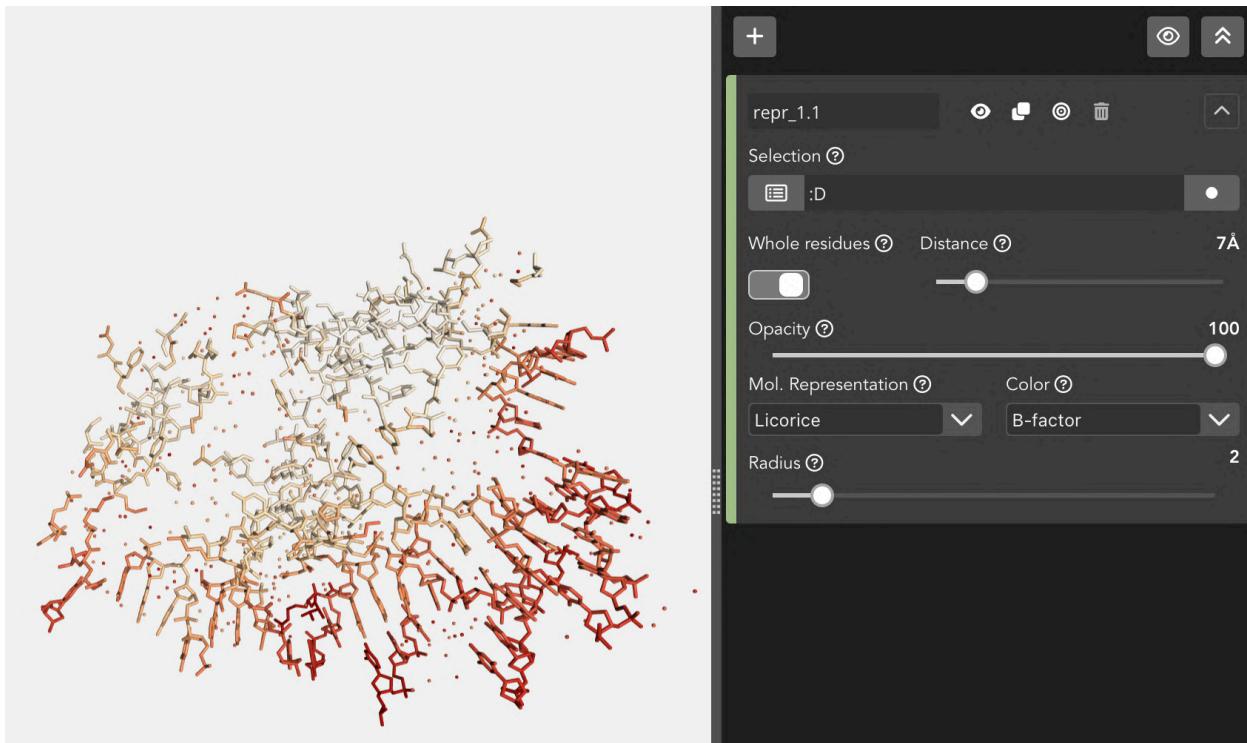
Common custom selection: all the molecules of the chain D are represented

When clicking this button, **all the atoms** that are within a certain **distance** of the selection will be given instead of the selection itself.



Distance-based custom selection: all the atoms within a distance of 7 Å of the chain D are represented

If the **Whole residues** switch button is enabled, **all the molecules** that have **at least one atom** within a **distance** of the selection will be given instead of the selection itself.



Distance-based custom selection: all the molecules that have at least one atom within a distance of 7Å of the chain D are represented

Opacity

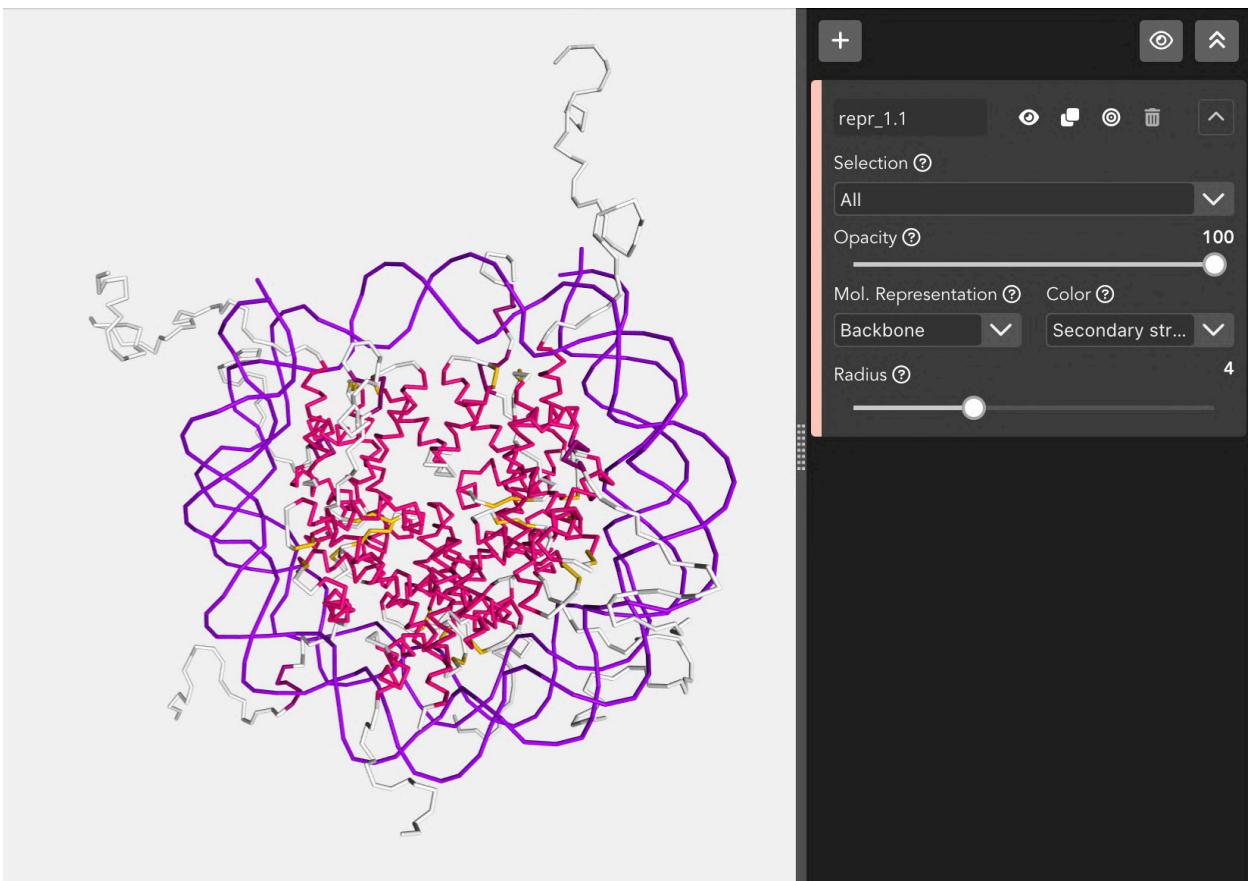
Through this slider, the **opacity** of the representation varies. Note that due to an incompatibility of NGL Viewer, opacity in multilayer projects can generate some **issues**. So creating multiple representations with different degrees of opacity can give **non desired outcomes**.

Molecular representation

The structure can be displayed using a variety of **molecular representations**:

Backbone

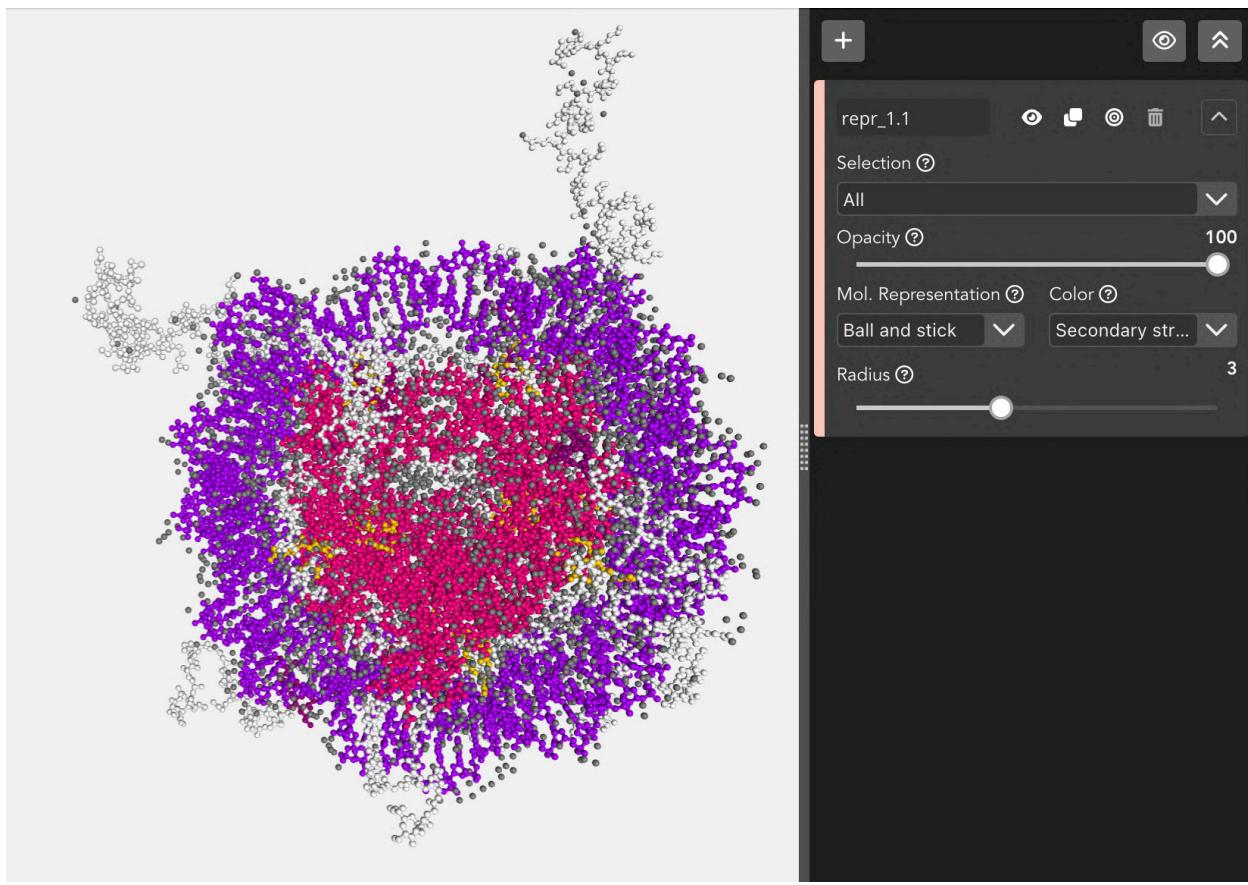
Cylinders connect successive residues of unbroken chains by their main backbone atoms, which are **.CA** atoms in case of proteins and **C4'/C3'** atoms for RNA/DNA, respectively. The main backbone atoms are displayed as spheres.



The **Backbone** representation allows to modify the **radius** of the backbone.

Ball and stick

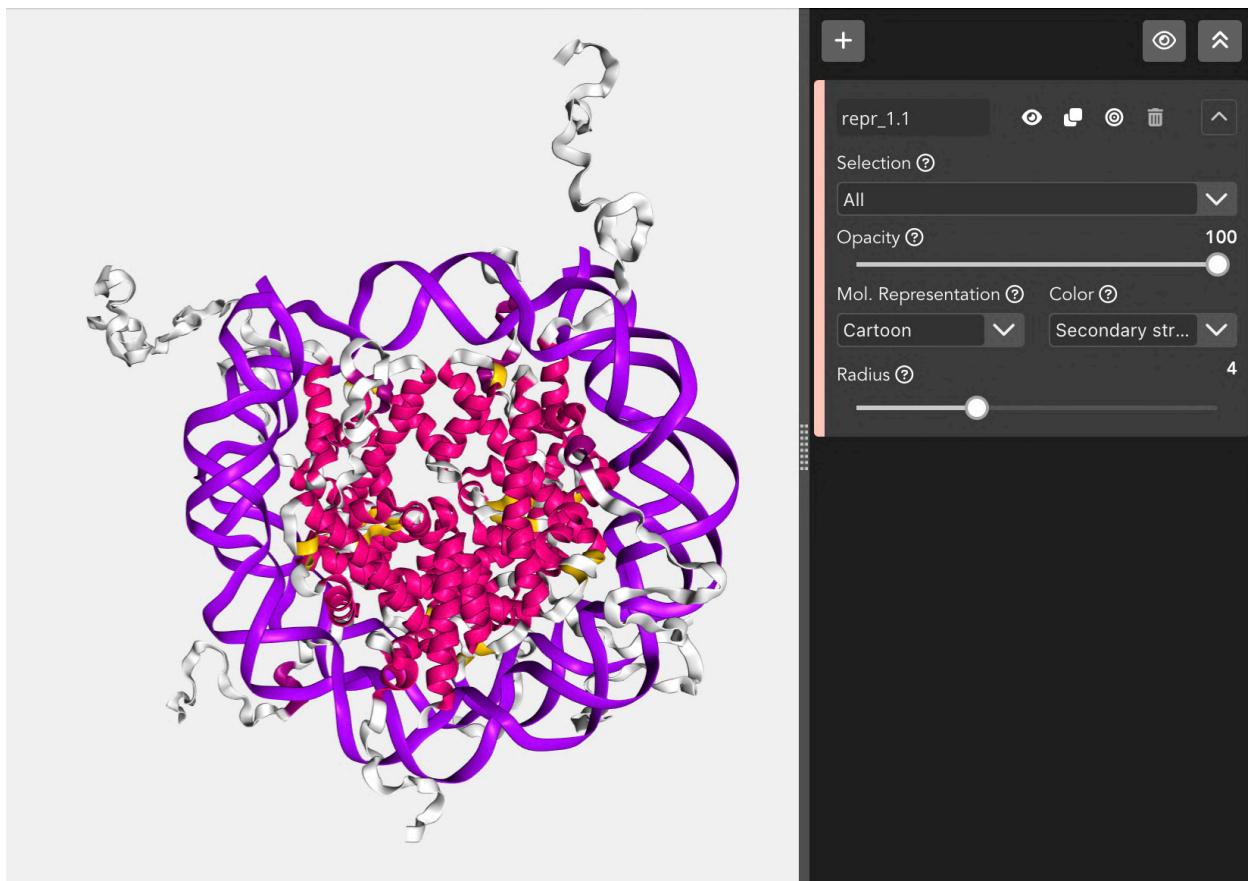
Atoms are displayed as spheres (balls) and bonds as cylinders (sticks).



The **Ball and stick** representation allows to modify the **radius** of the balls (atoms) and the sticks (bonds).

Cartoon

The main backbone atoms (see backbone) of successive residues in unbroken chains are connected by a smooth trace. The trace is expanded perpendicular to its tangent with an elliptical cross-section. The major axis points from **.CA** in the direction of the **.O** in case of proteins and from the **C1'/C3'** to **C2'/O4'** for RNA/DNA, respectively.

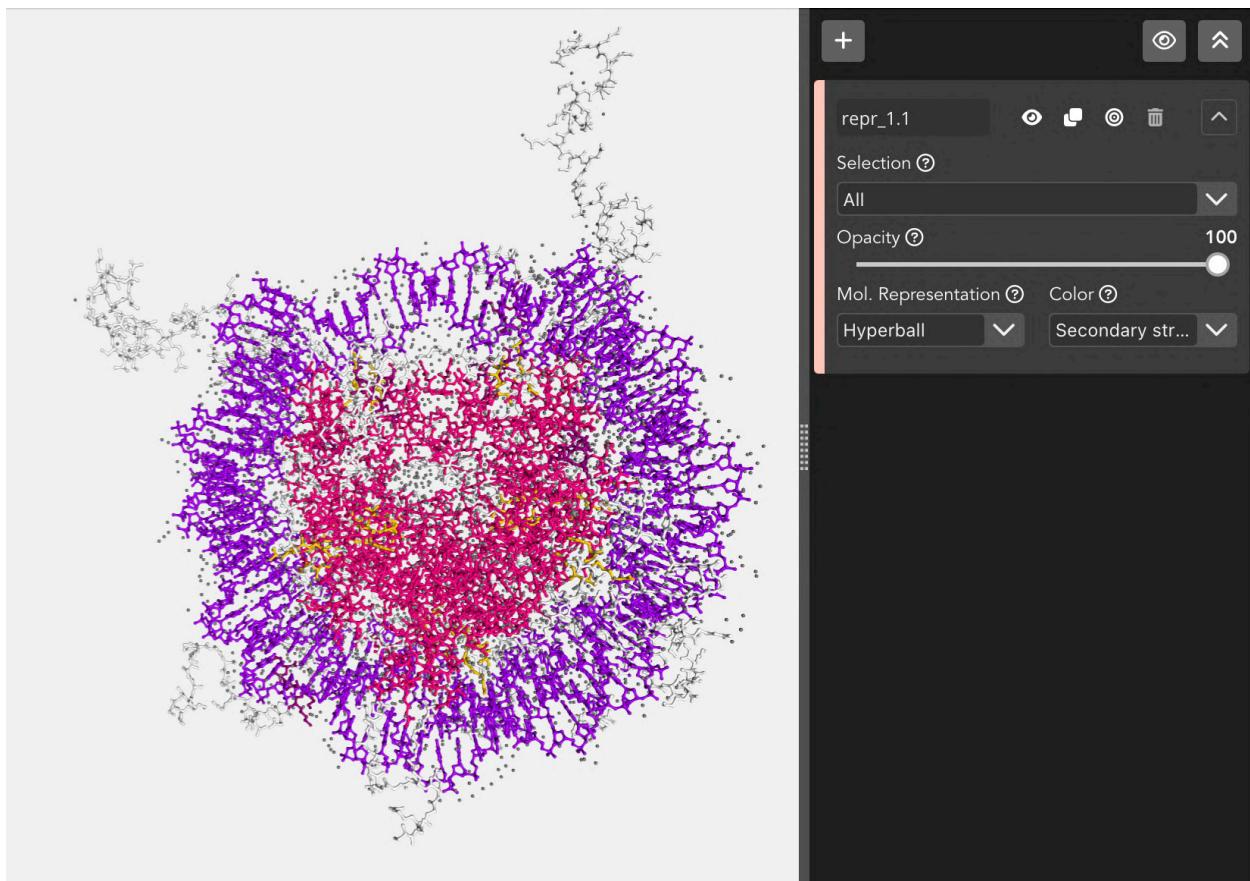


The **Cartoon** representation allows to modify the **radius** of the trace.

Due to a shortcoming of NGL Viewer, the **cartoon** and **ribbon** representations only can show **four or more** consecutive residues.

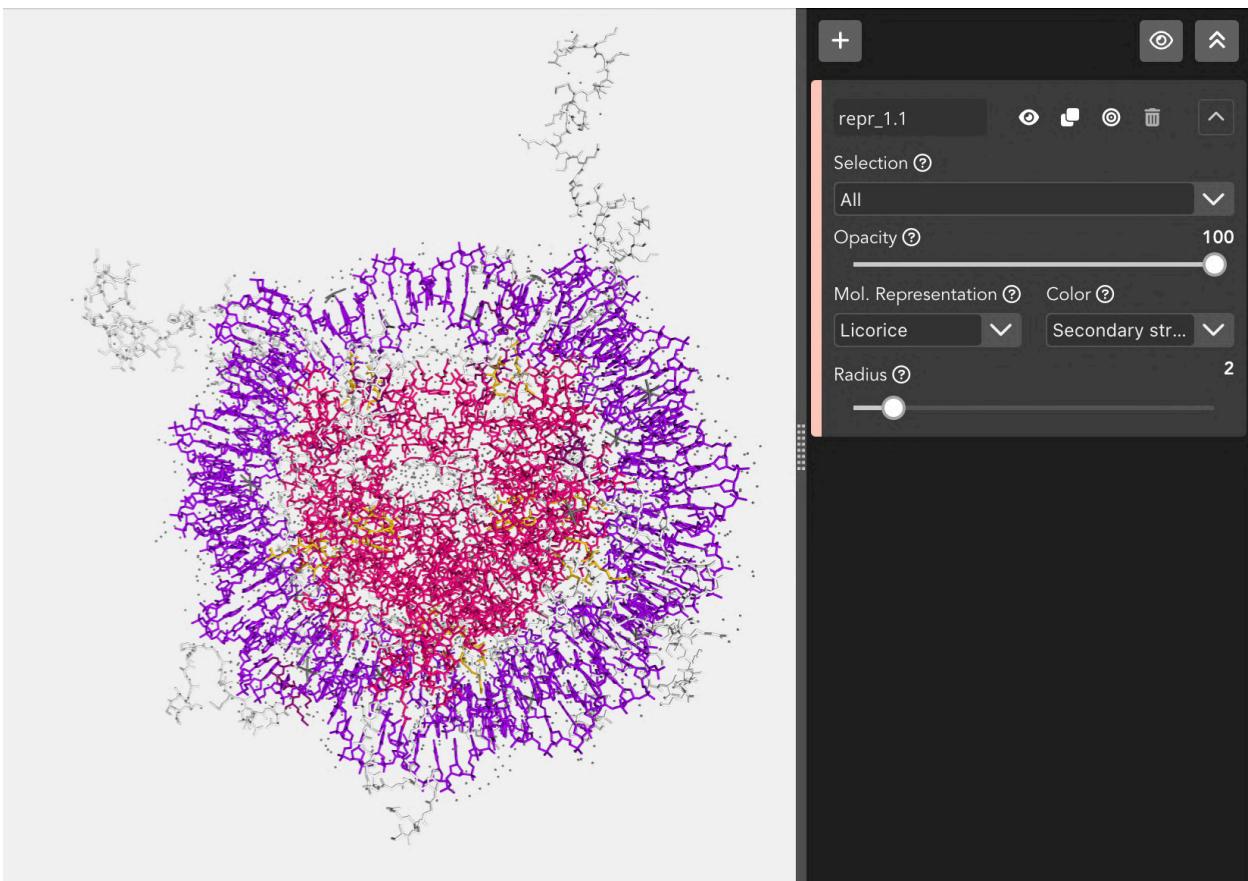
Hyperball

A derivate of the **ball+stick** representation (pioneered by HyperBalls project) in which atoms are smoothly connected by an elliptic hyperboloid.



Licorice

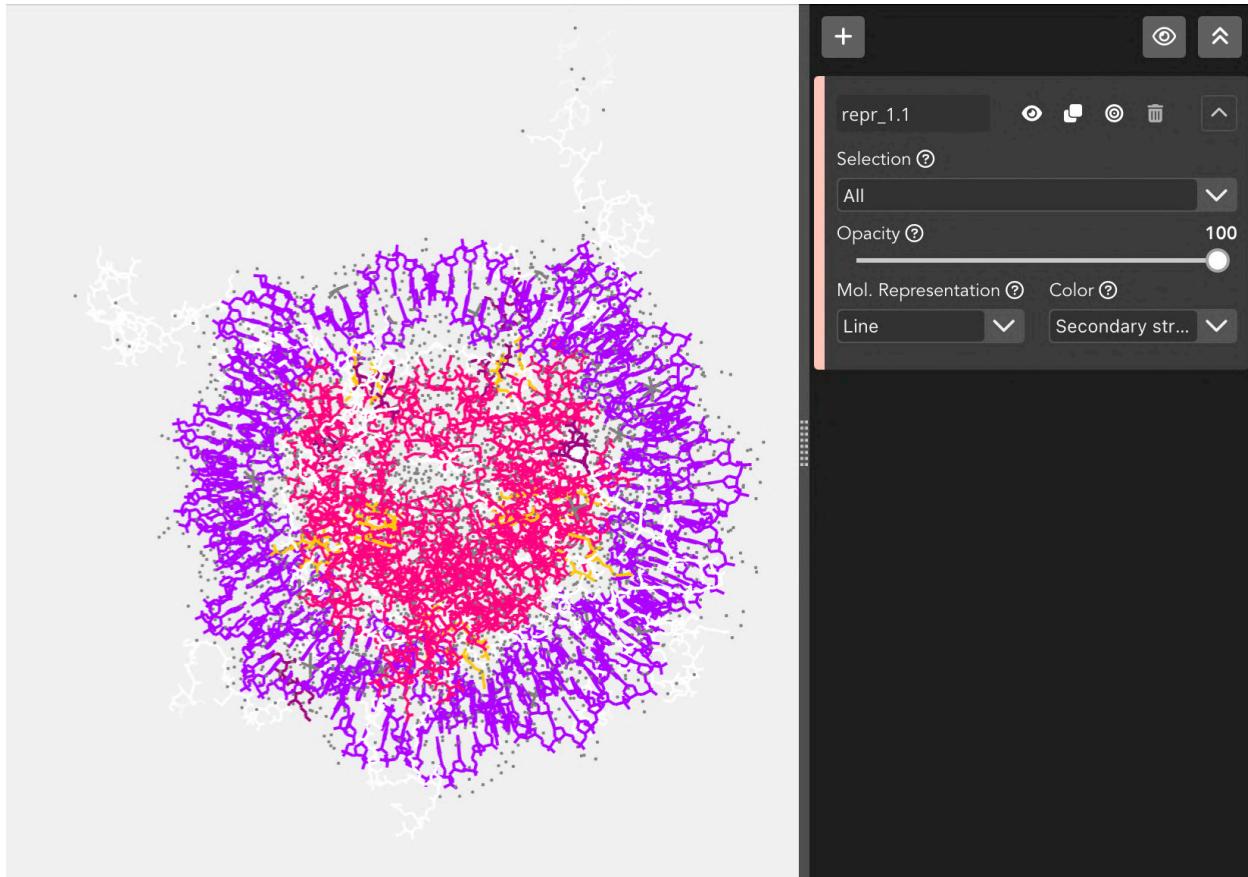
A variant of the *ball+stick* representation where balls and sticks have the same radius.



The **Licorice** representation allows to modify the **radius** of the balls (atoms) and the sticks (bonds).

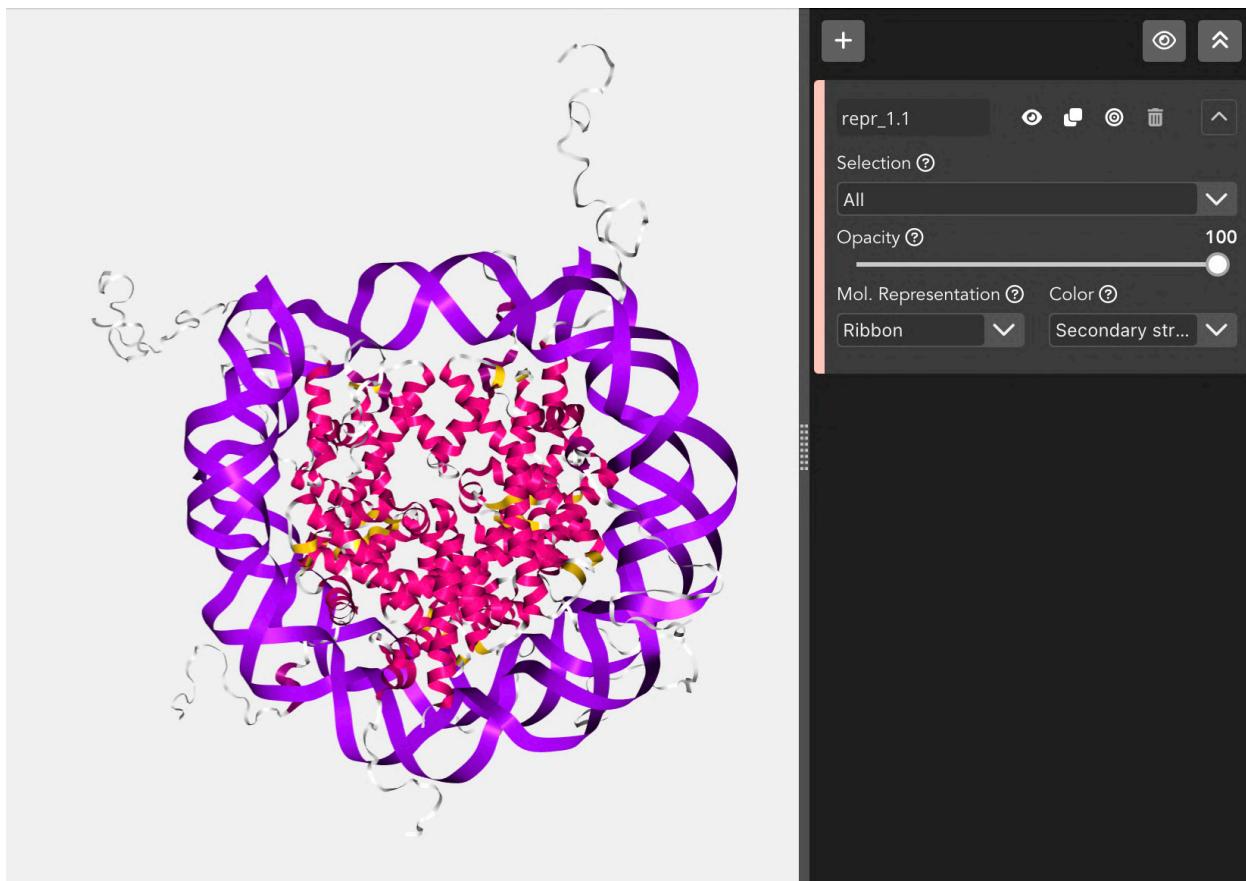
Line

Bonds are displayed by a flat, unshaded line.



Ribbon

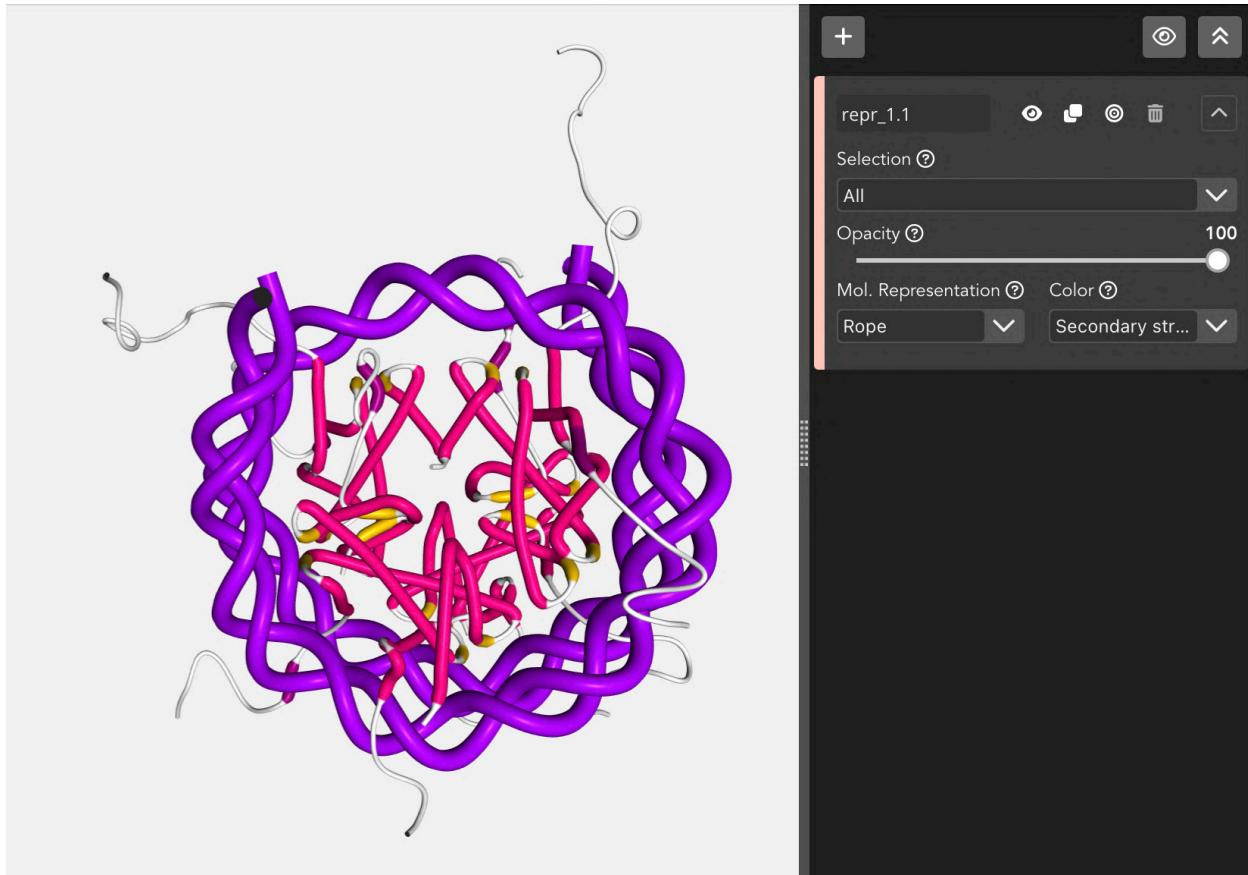
A thin ribbon is displayed along the main backbone trace.



Due to a shortcoming of NGL Viewer, the **cartoon** and **ribbon** representations only can show **four or more** consecutive residues.

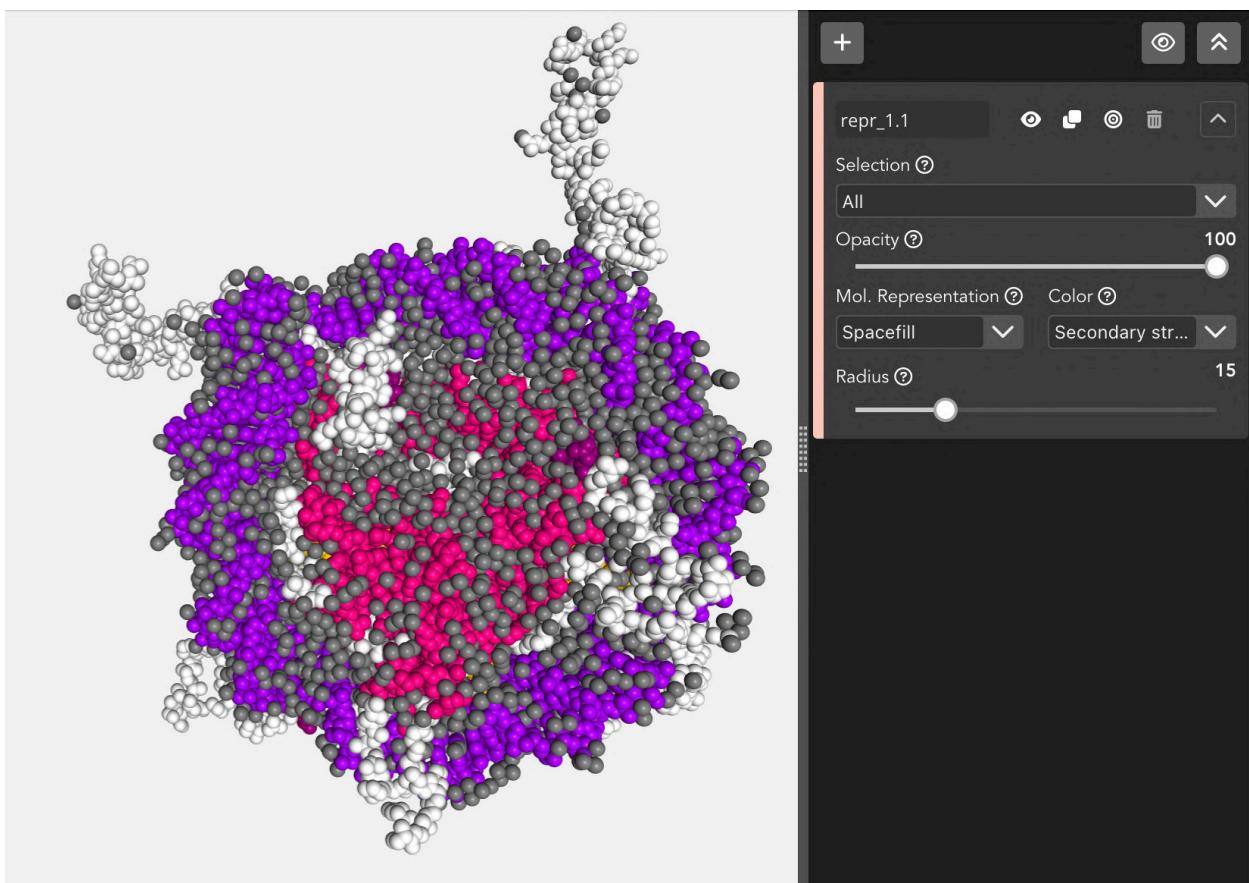
Rope

A rope-like protein fold abstraction well suited for coarse-grained structures. In this representation a tube follows the center points of local axes. The result is similar to what is shown by the [Bendix tool](#).



Spacefill

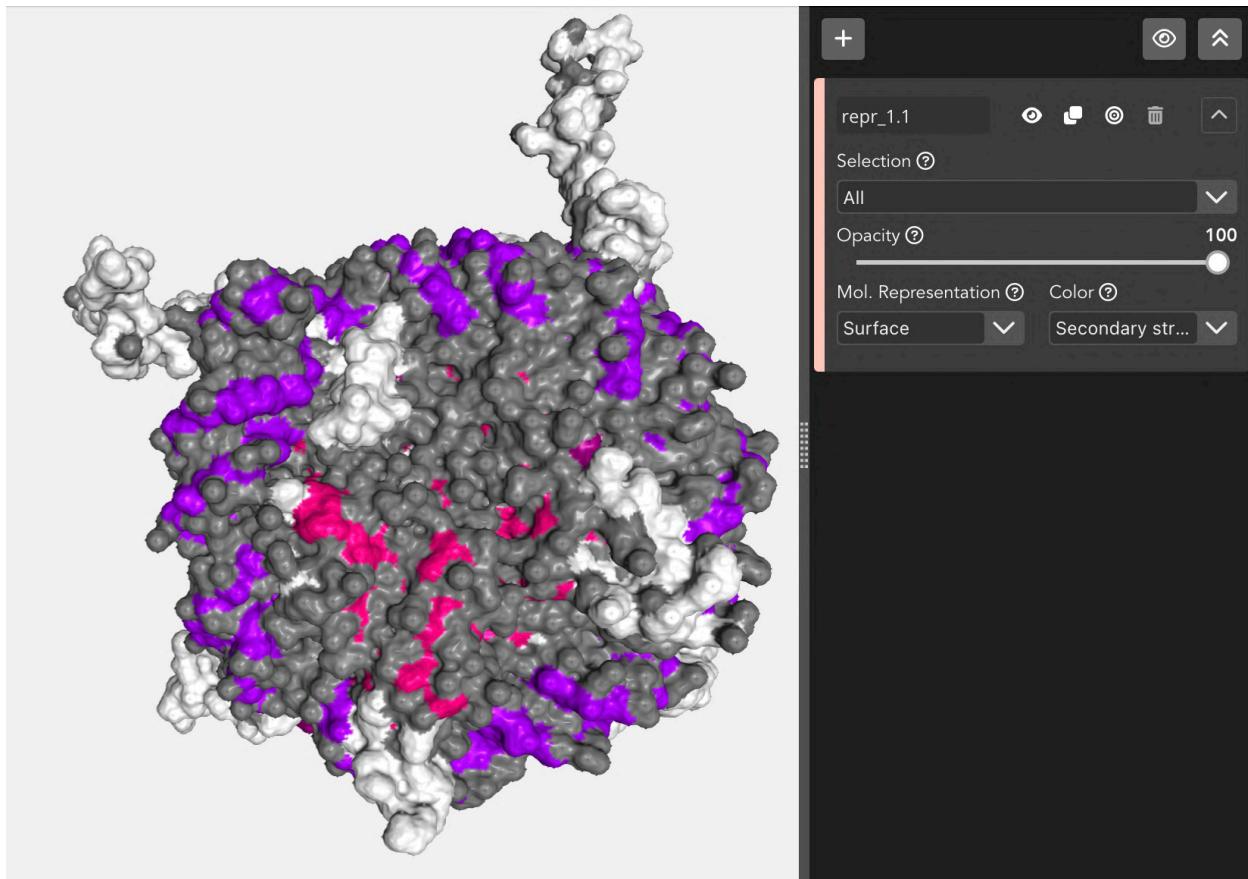
Atoms are displayed as a set of space-filling spheres.



The **Spacefill** representation allows to modify the **radius** of the spheres.

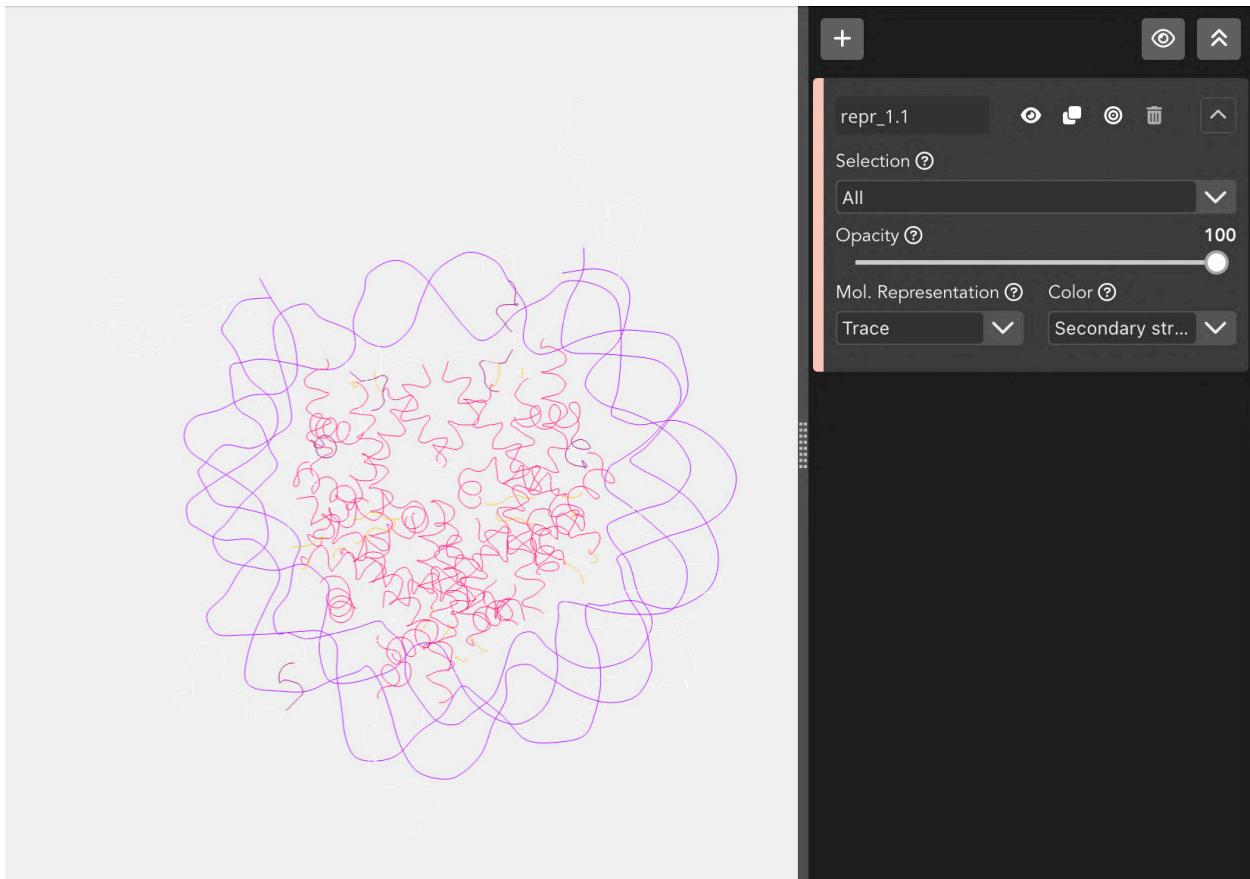
Surface

Displays the molecular surface and its variants.



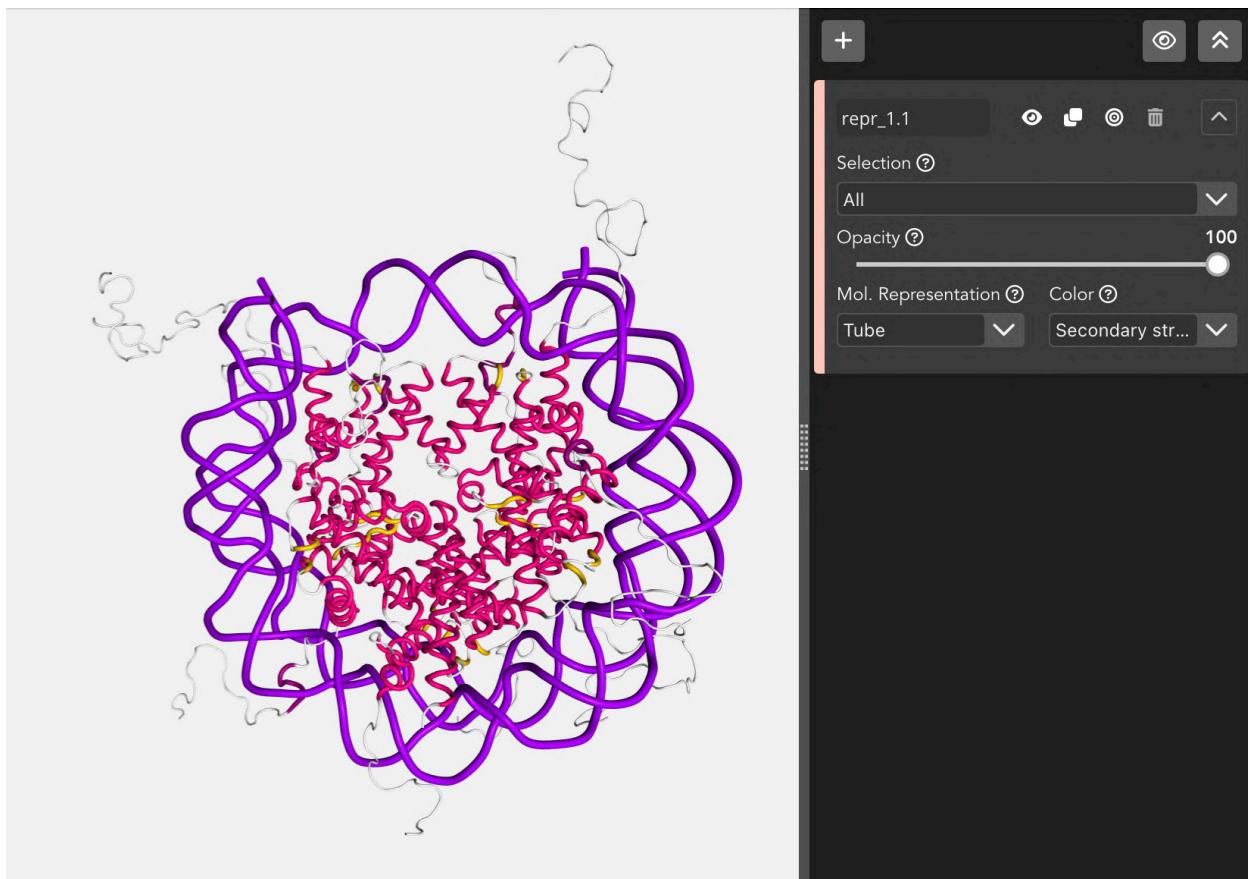
Trace

A flat, unshaded line is displayed along the main backbone trace.



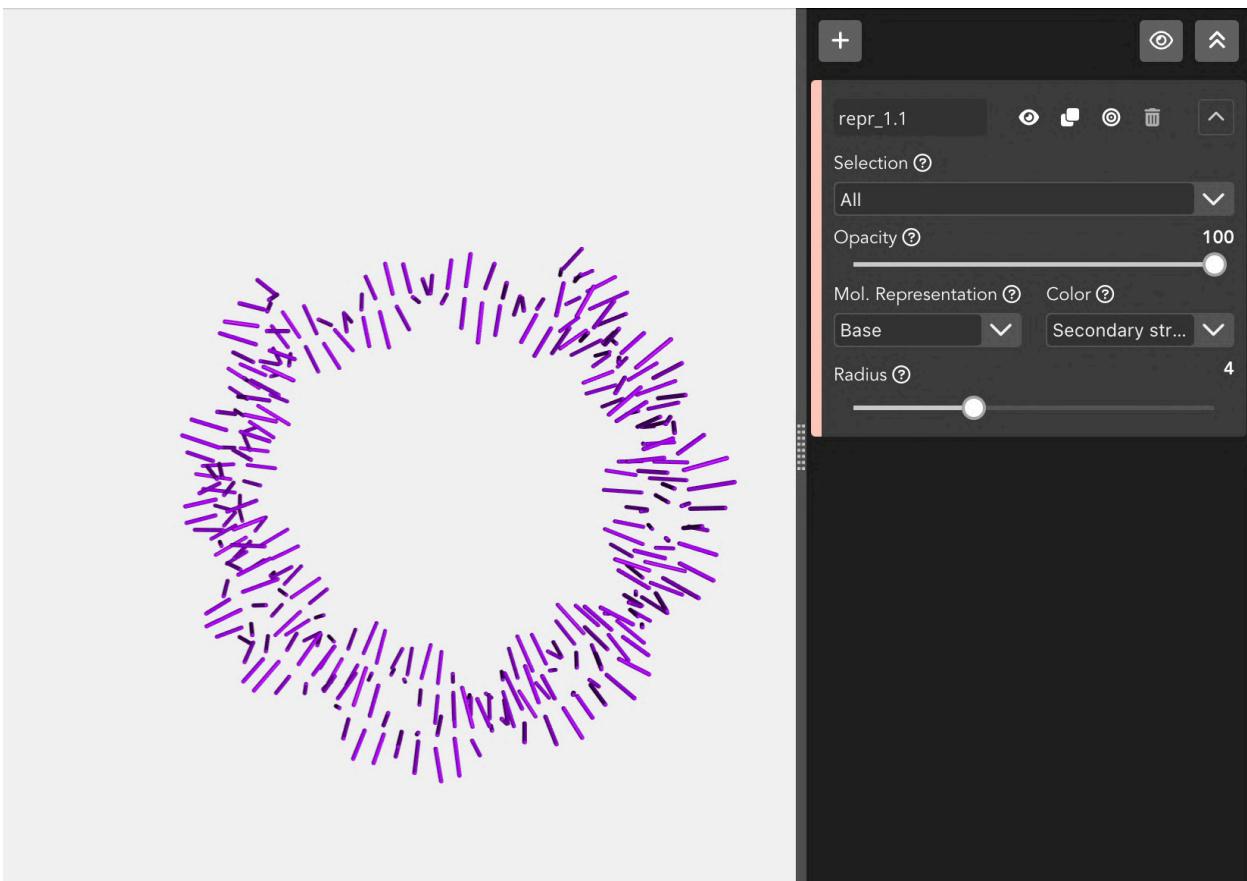
Tube

Essentially like cartoon but with the aspectRatio fixed at a value of 1.0.



Base

Simplified display of **RNA/DNA nucleotides**, best used in conjunction with a cartoon representation. Here, a stick is drawn connecting the sugar backbone with a nitrogen in the base (.N1 in case of adenine or guanine, .N3 in case of thymine or cytosine).



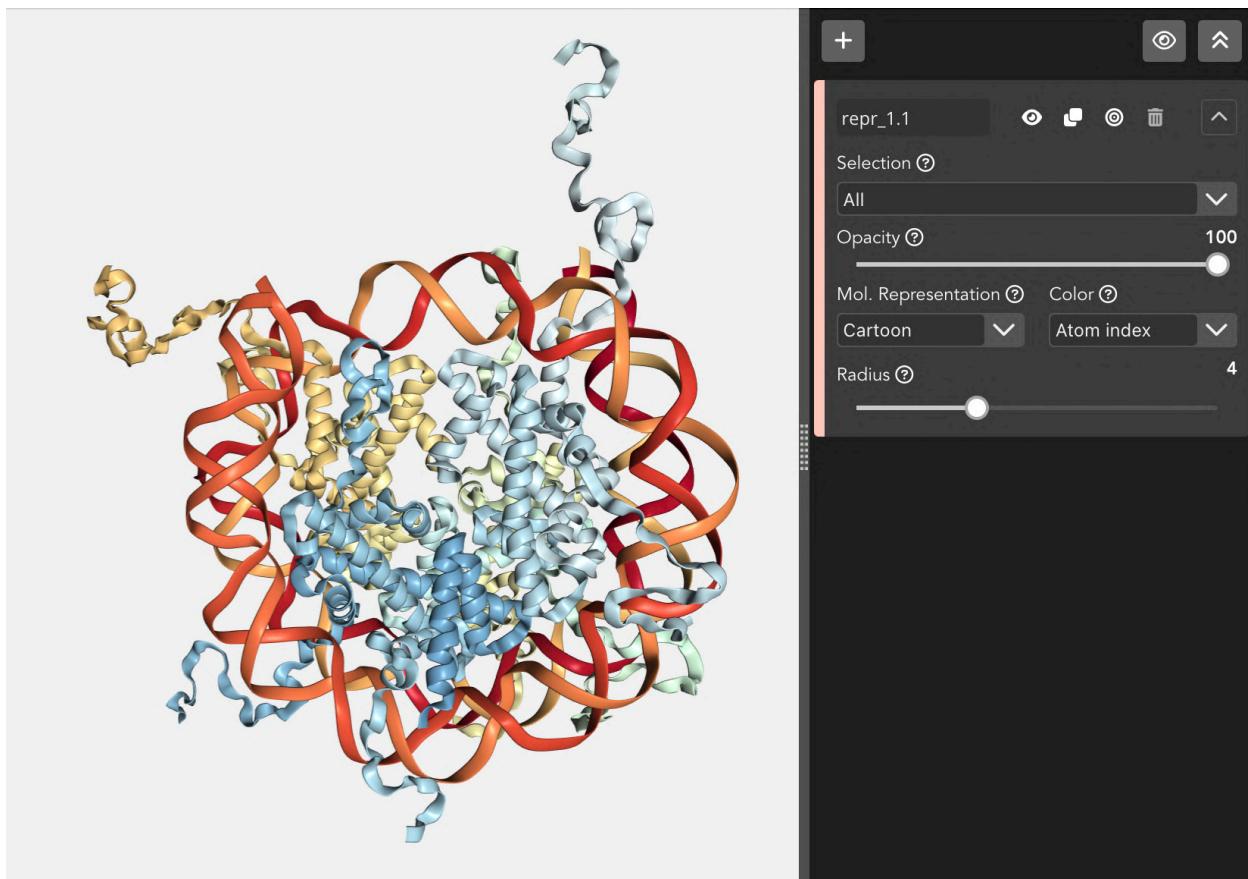
The **Base** representation allows to modify the **radius** of the sticks.

Color scheme

Each loaded structure can be displayed using a variety of **color schemes**:

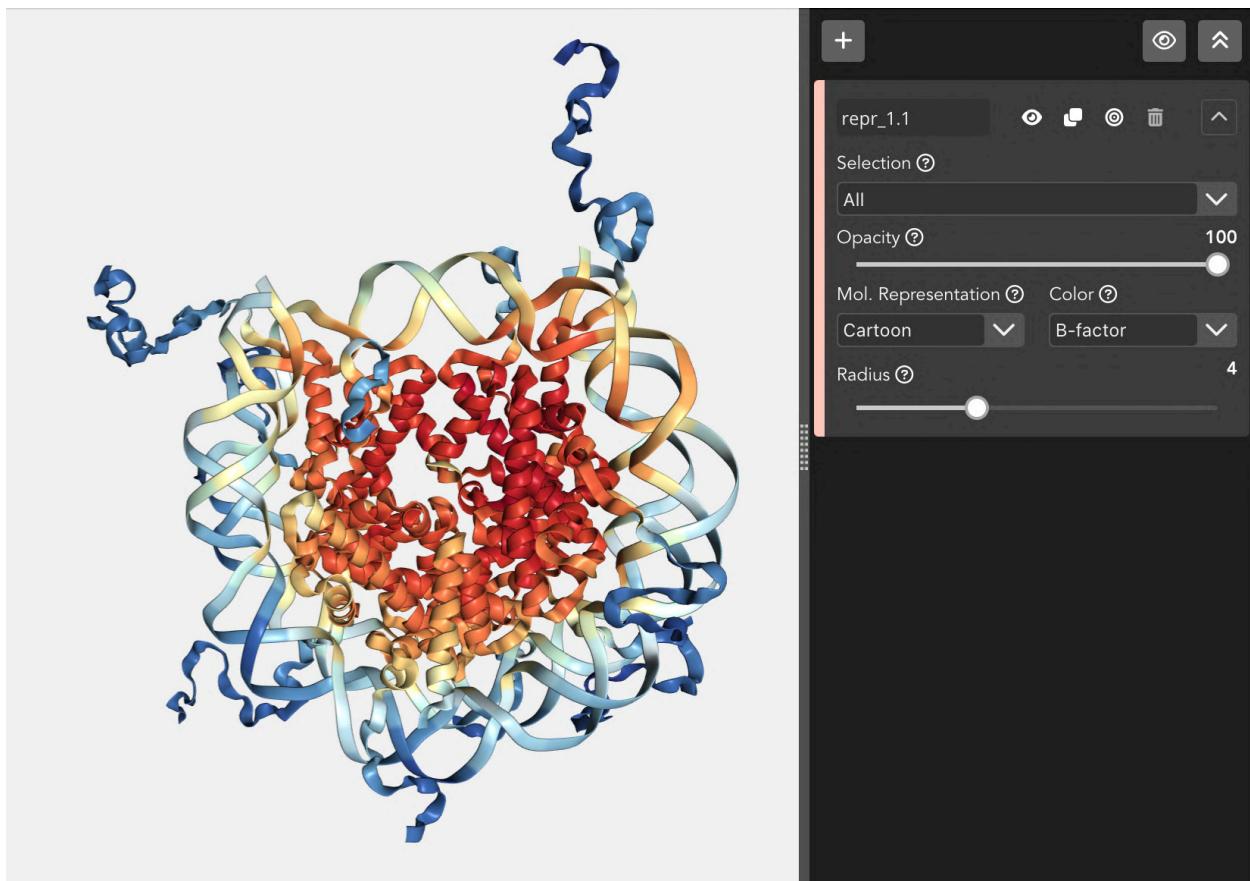
Atom index

Color by atom index.



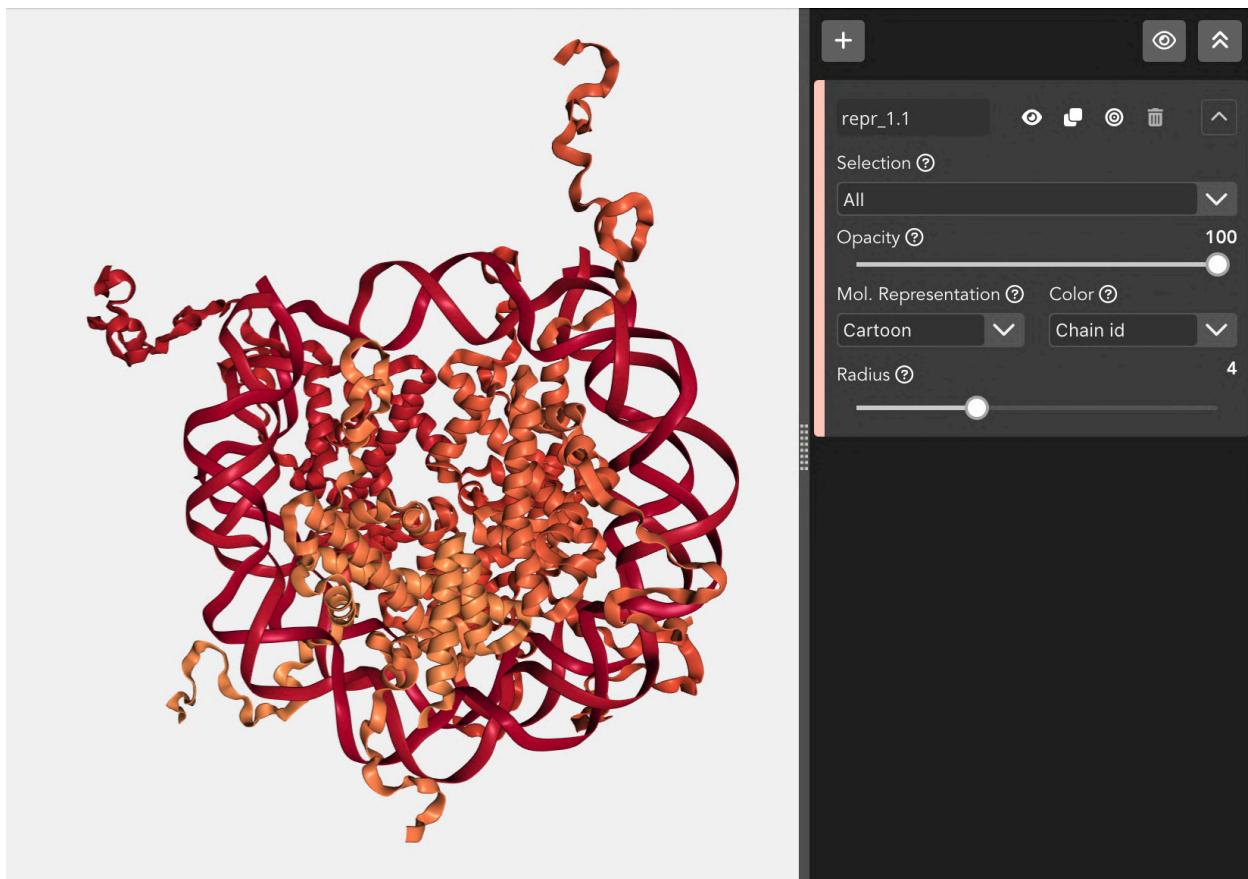
B-factor

Color by b-factor.



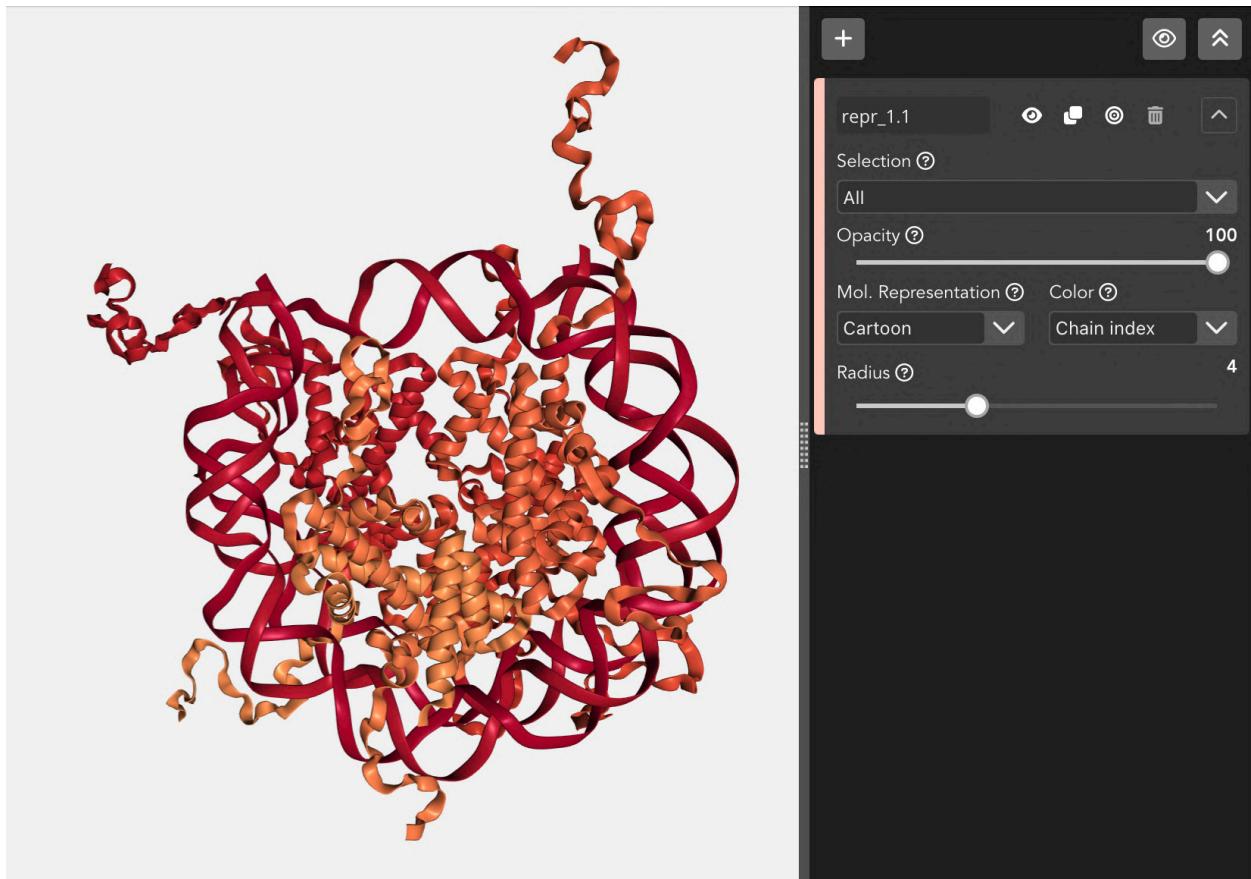
Chain id

Color by chain id.



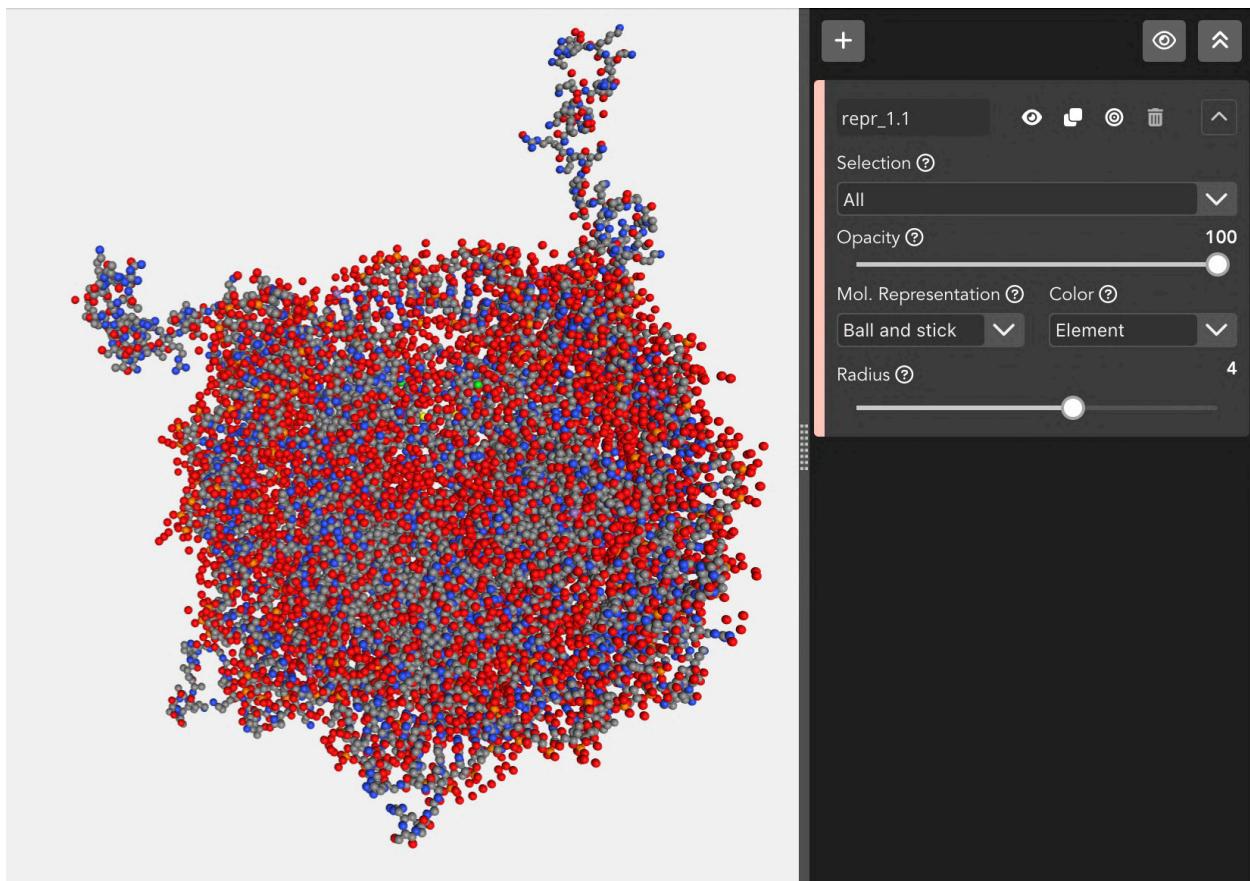
Chain index

Color by chain index.



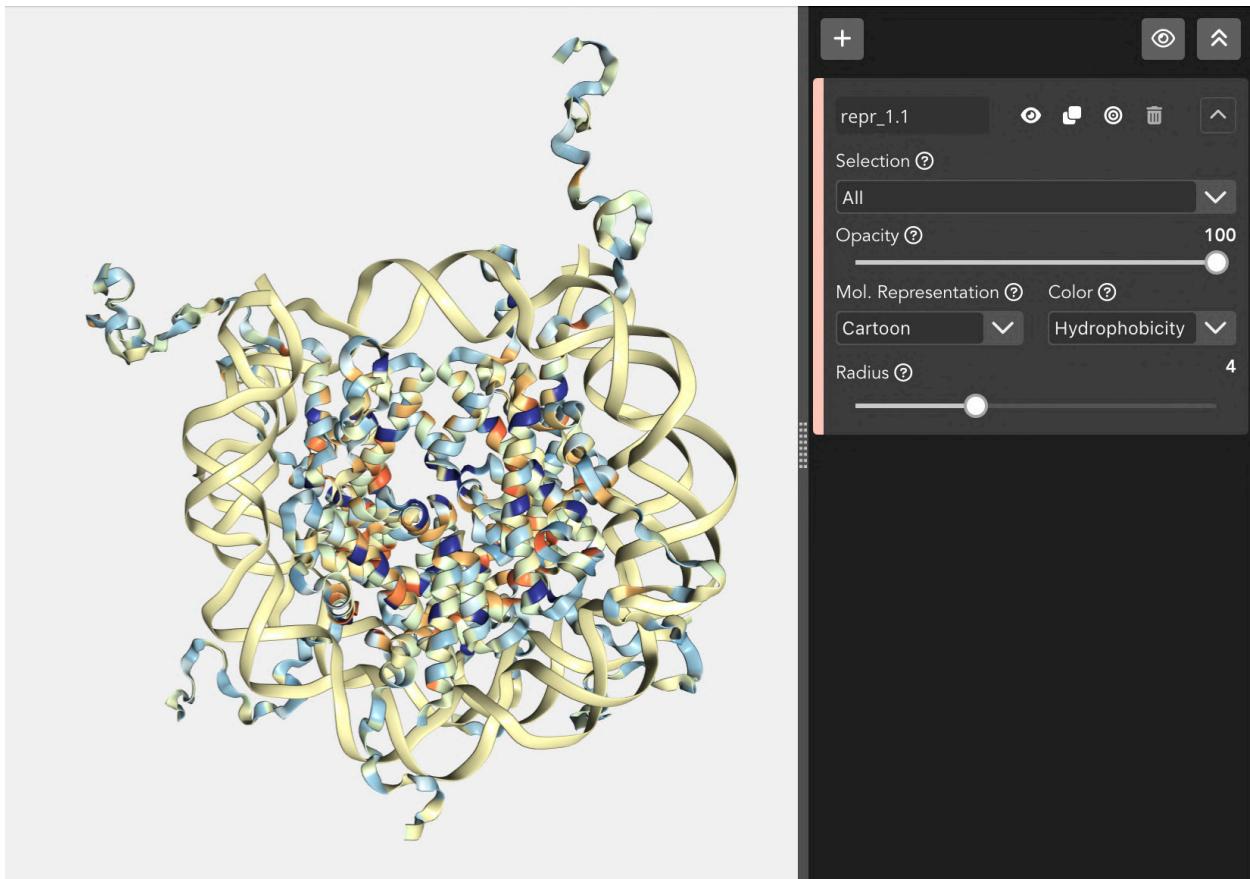
Element

Color by chemical element.



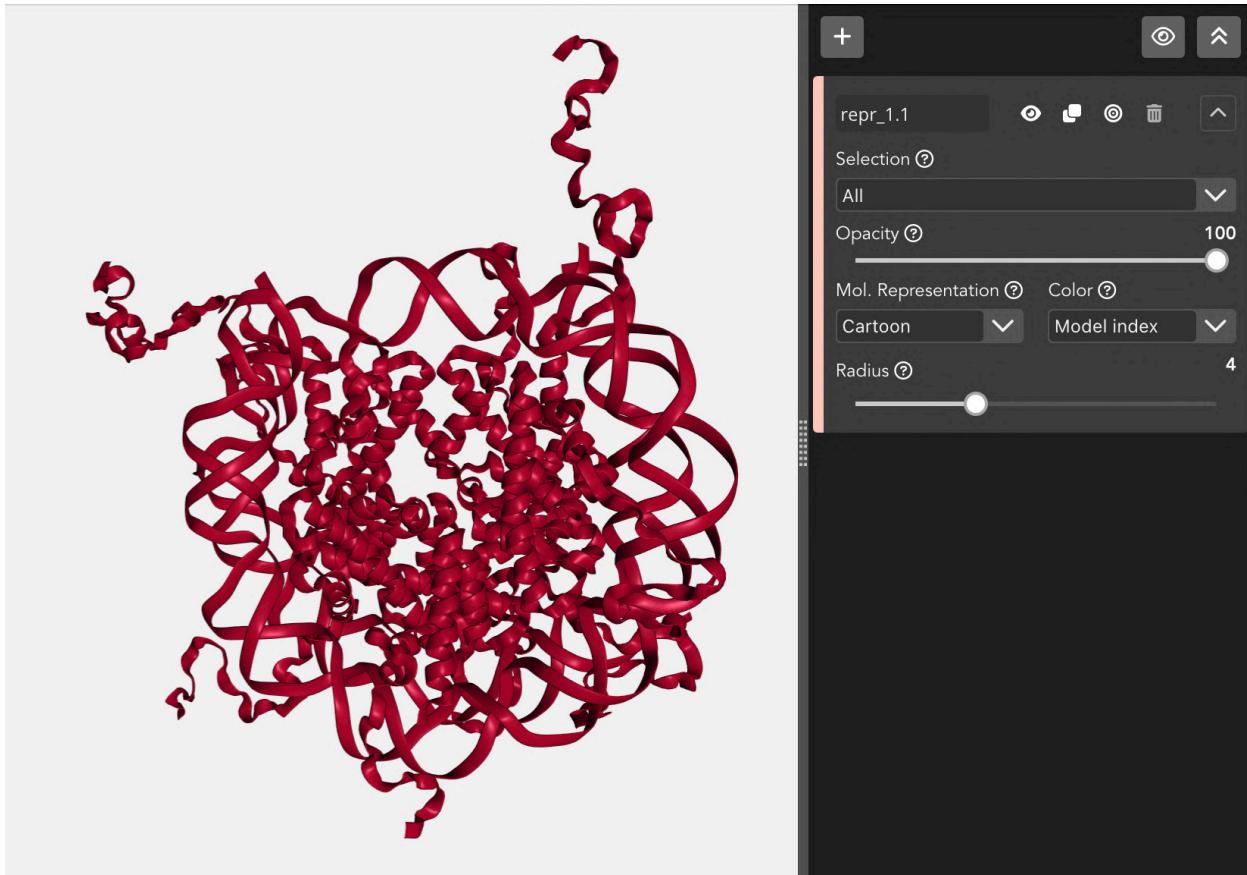
Hydrophobicity

Color by hydrophobicity.



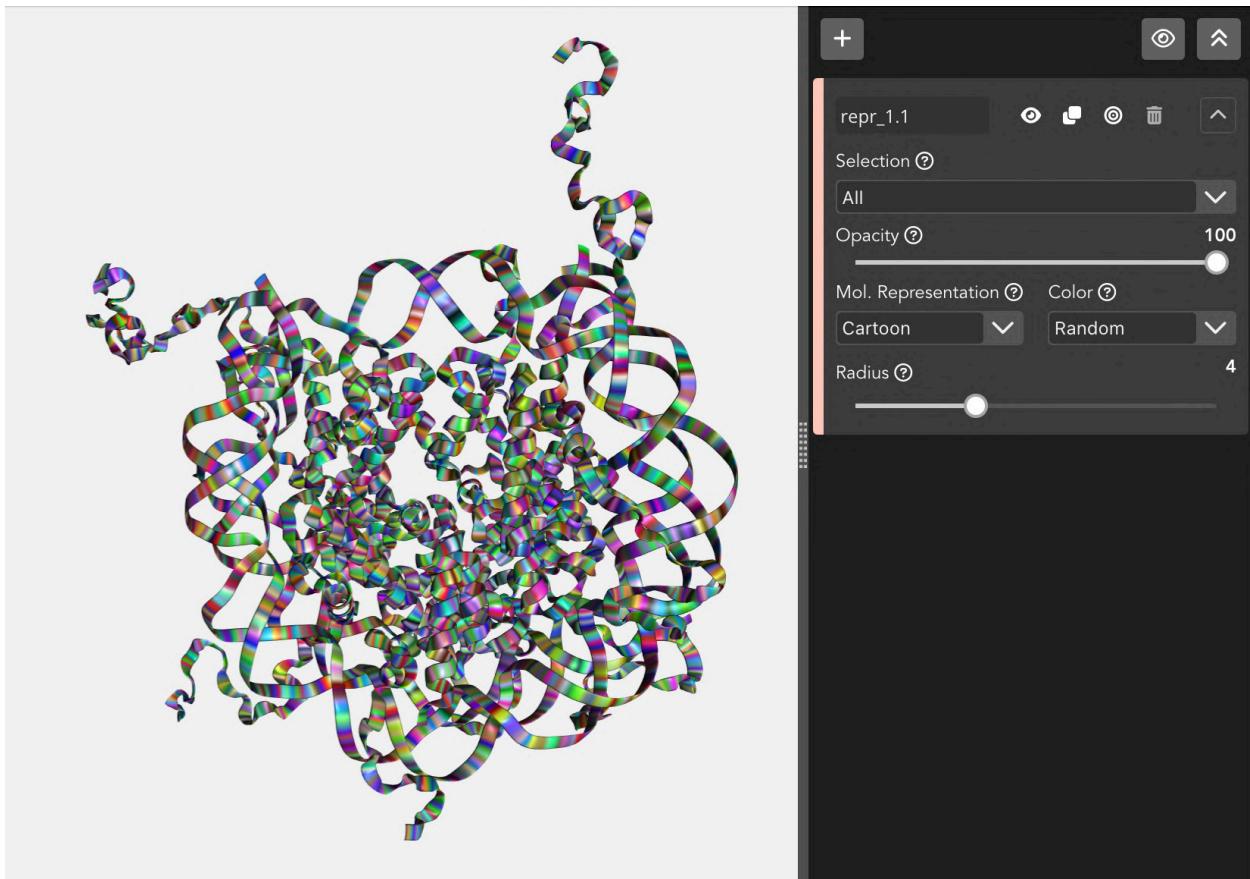
Model index

Color by model index.



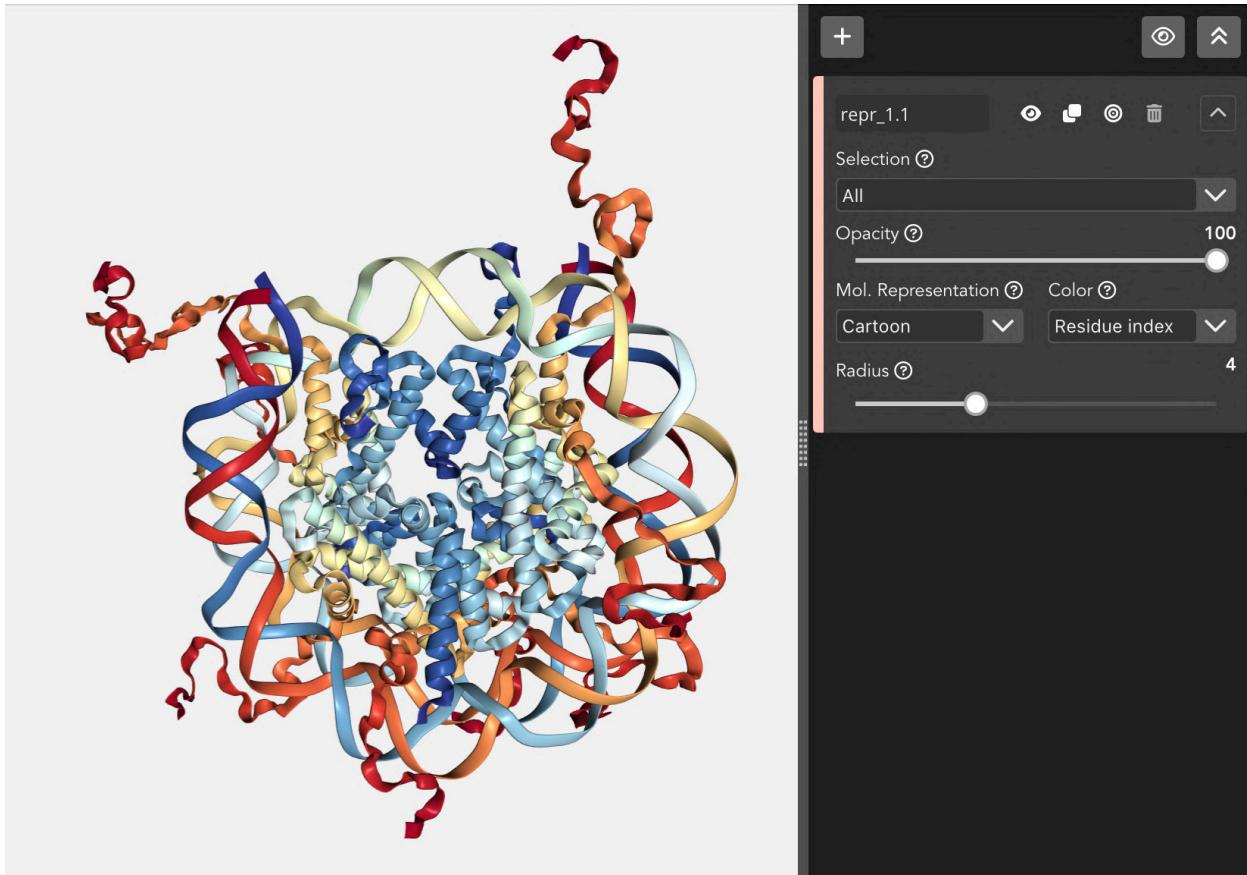
Random

Class by random color.



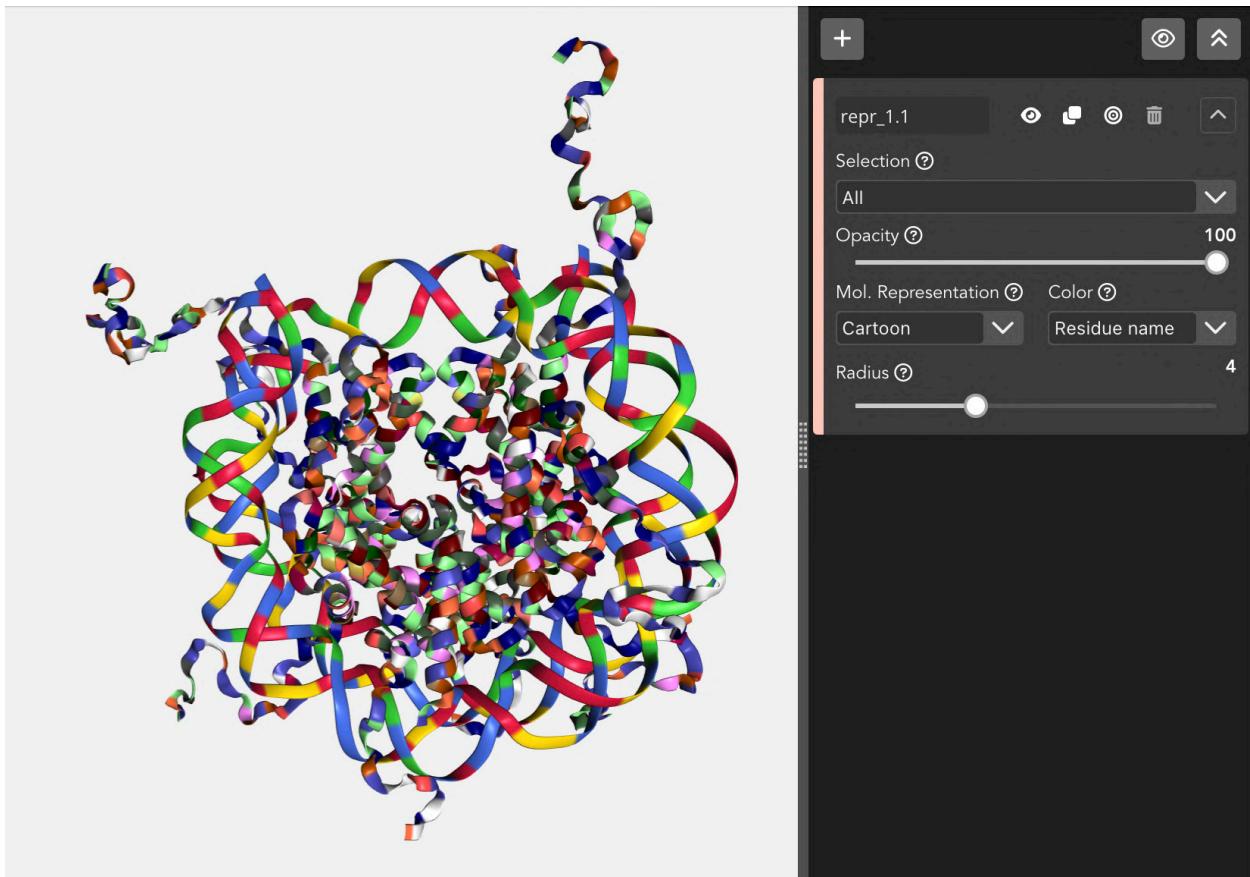
Residue index

Color by residue index.



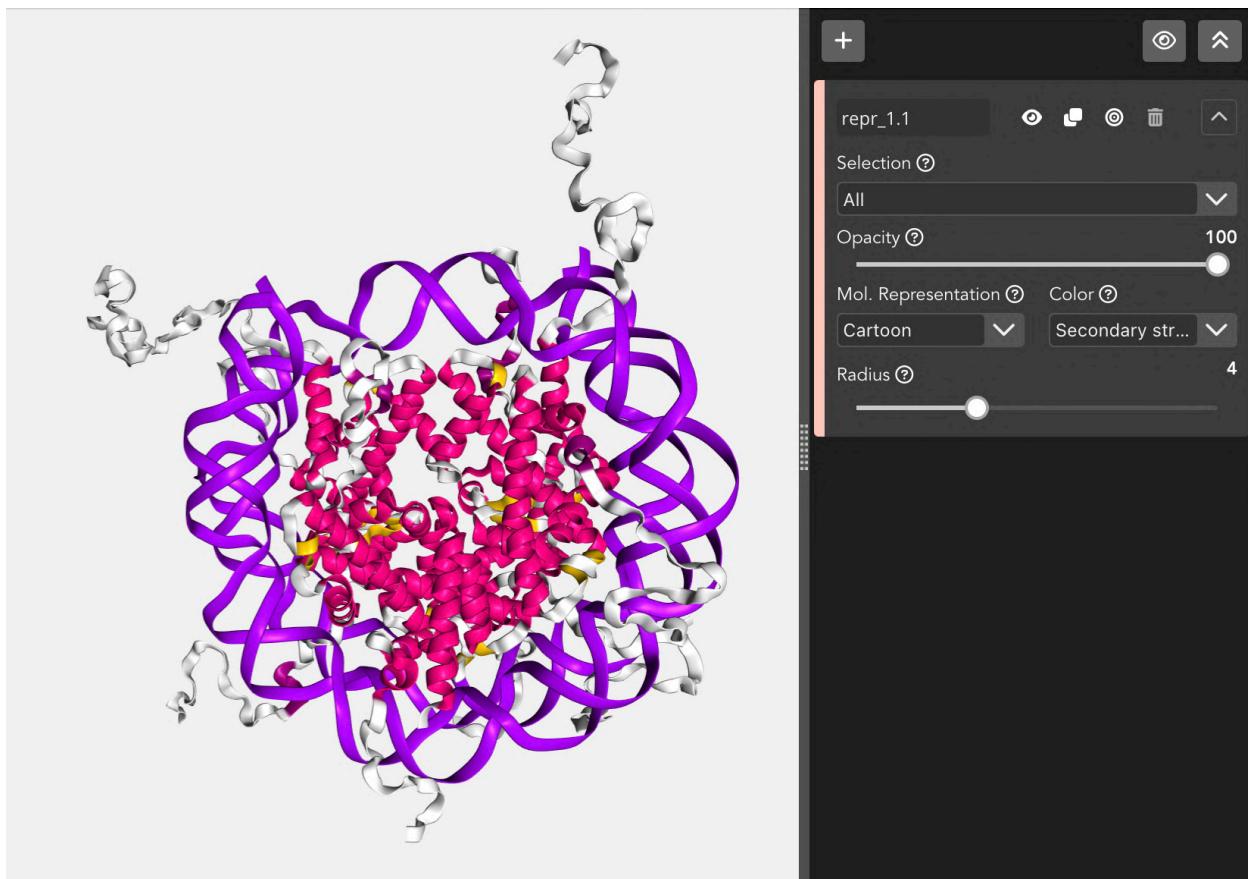
Residue name

Color by residue name.



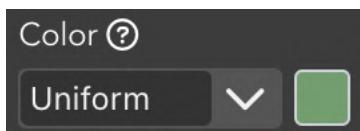
Secondary structure

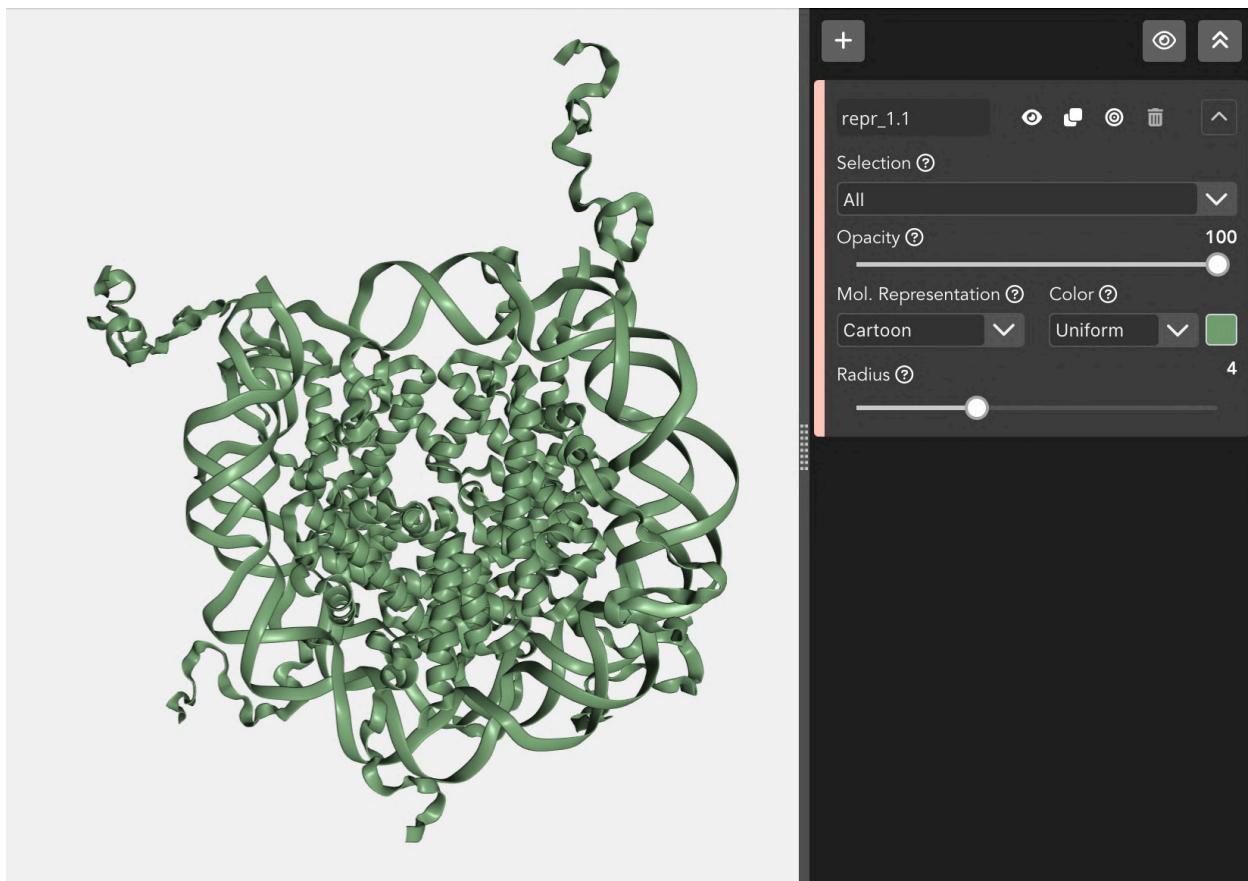
Color by secondary structure.



Uniform

Color by uniform color selected from the **color picker** that appears at right of the dropdown menu when this option is selected.



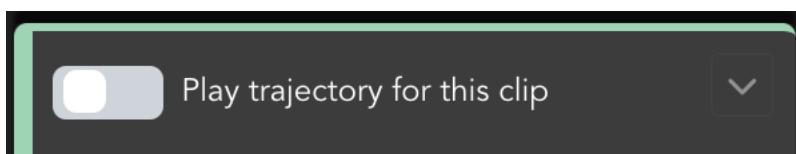


Radius

Through this slider, the **radius** can be modified in the next molecular representations:

- Backbone
- Ball and stick
- Cartoon
- Licorice
- Spacefill
- Base

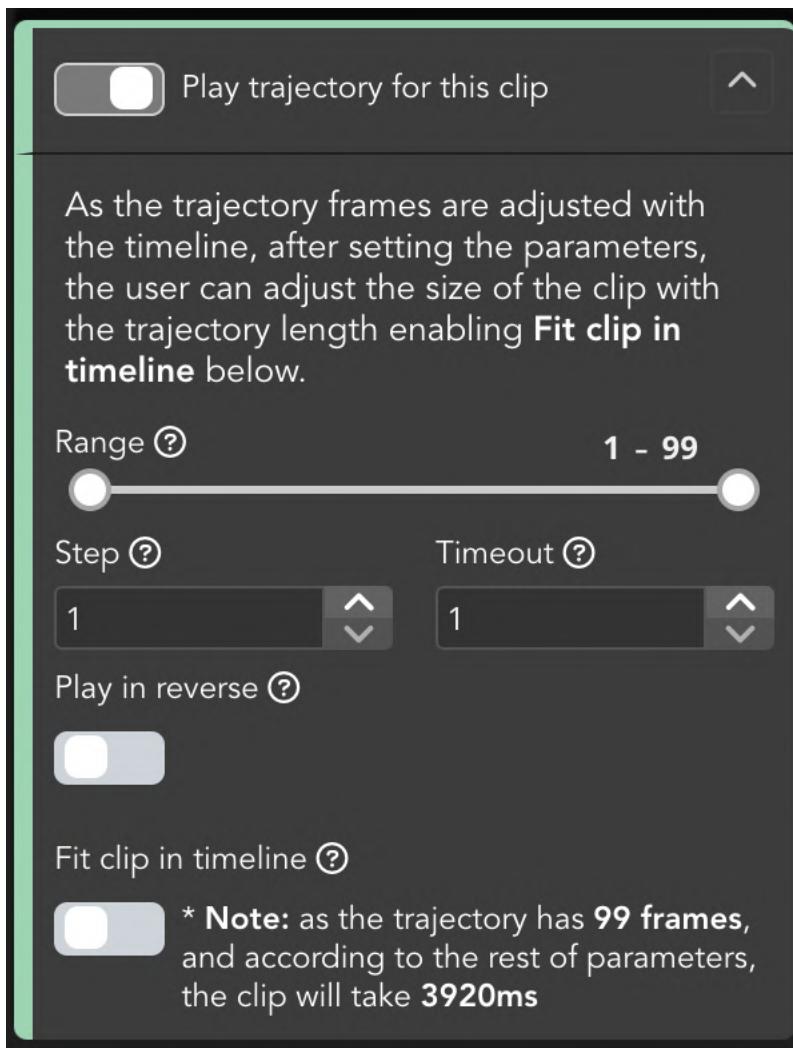
4.3.2 Trajectories



When working with a project with a *topology and a trajectory* and *selecting a clip or a keyframe* in the **Timeline**, the above **editor** module appears on the **Representations** area.

By default it's disabled. That means that, when we start a new project with a **trajectory**, this trajectory is not **applied** to the **structure** until the **Play trajectory for this clip** switch button is **enabled**.

Enable / Disable trajectory



When enabling the **Play trajectory for this clip** switch button, the editor **expands** all the **settings**. From now on, the **trajectory is active** for the clip selected in the **Timeline** and we can check it by clicking for example the **Play** button in the **Timeline**,

Range

Initially set from the first to the last frame of the trajectory, defines a **range of frames** with which the trajectory will be played.

Taking into account that for **long trajectories**, the modification of the range can be annoying, a couple of **features** have been introduced:

- On the one hand, **both of the numbers** at the right top of the range are **editable**. Click on both of them in order to introduce the desired frame.
- On the other hand, **range values** can be adjusted via **keyboard** with the following shortcuts:
 - **⌘/Ctrl + ⌘/Alt + 1** **decreases initial frame**
 - **⌘/Ctrl + ⌘/Alt + 2** **increases initial frame**
 - **⌘/Ctrl + ⌘/Alt + 3** **decreases final frame**
 - **⌘/Ctrl + ⌘/Alt + 4** **increases final frame**

For more tips, see the *[tips section](#)*. For more shortcuts, see the *[shortcuts section](#)*.

Step

Defines the **number of frames** between playing **steps**.

Timeout

Timeout between playing frames (40ms per unit).

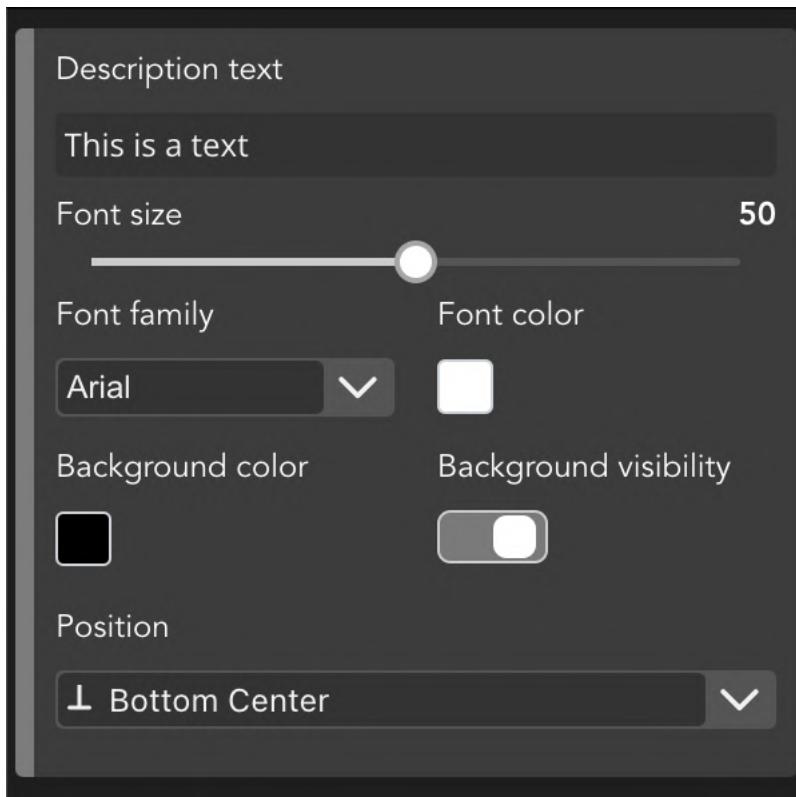
Play in reverse

If enabled plays the trajectory **backwards**.

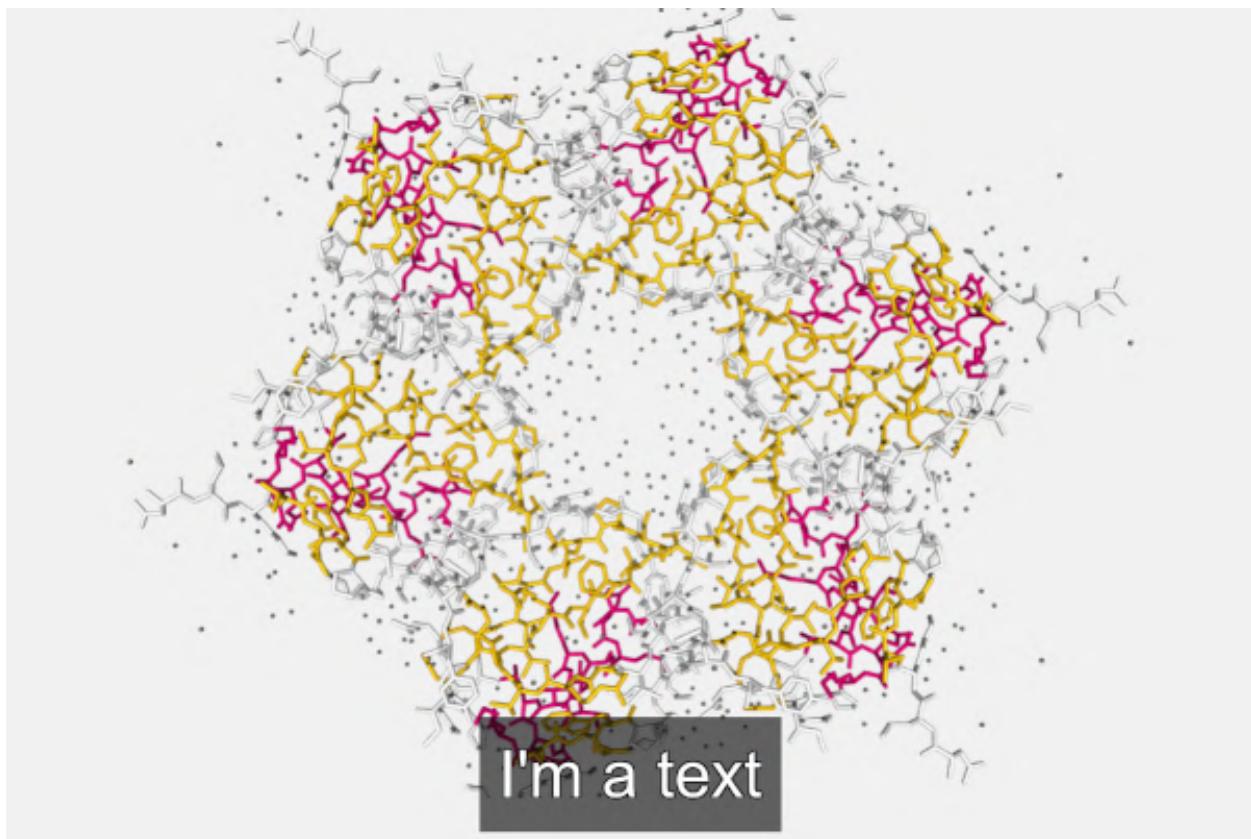
Fit clip in timeline

Adjust the selected clip in **Timeline** size with the **trajectory lenght**. Beside the switch button there is a **text** that, dynamically, updates the **number of frames** of the trajectory after modifying the **range** and the **time of the clip** in ms after modifying **step** and / or **timeout**.

4.3.3 Descriptions

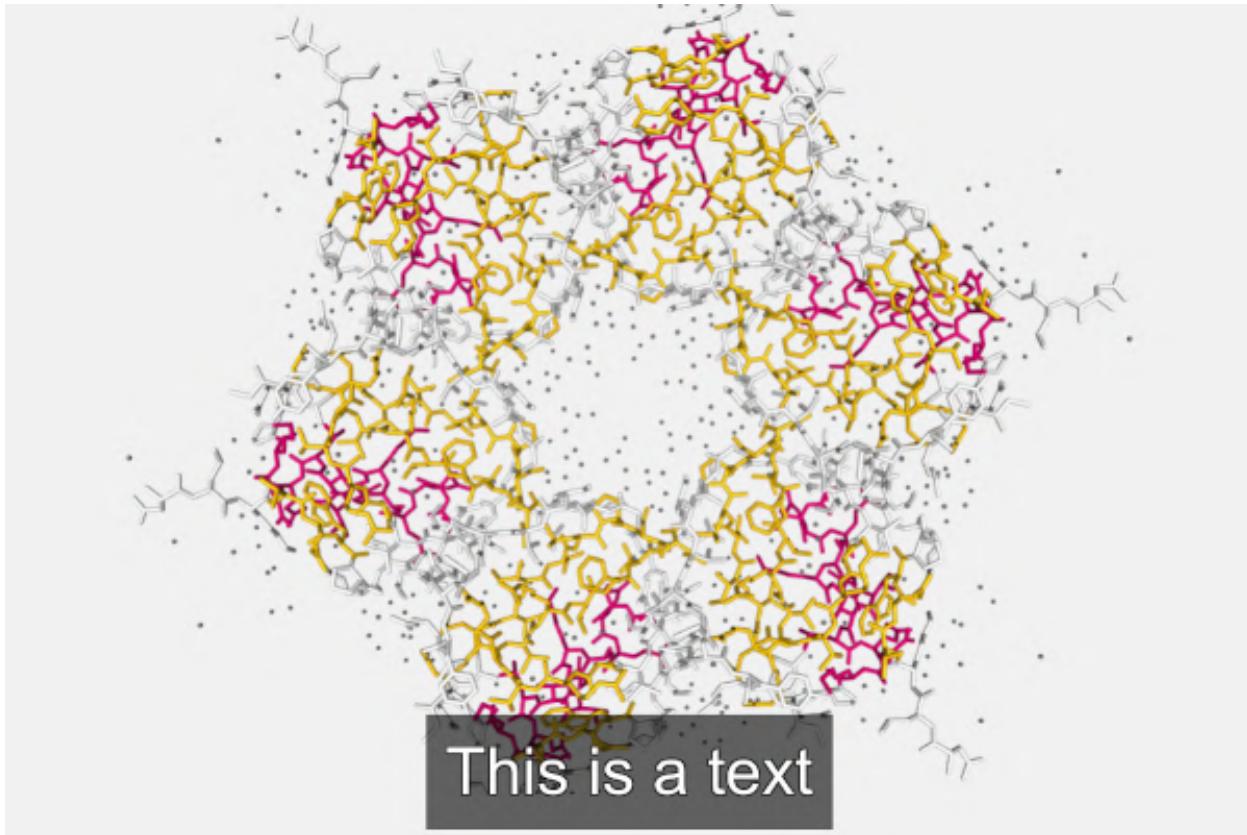


As explained in the [Descriptions](#) section, users can add **descriptive texts** to the Timeline. Clicking on a [keyframe or a description](#) in the Timeline, the above **editor** module appears on the **Representations** area.



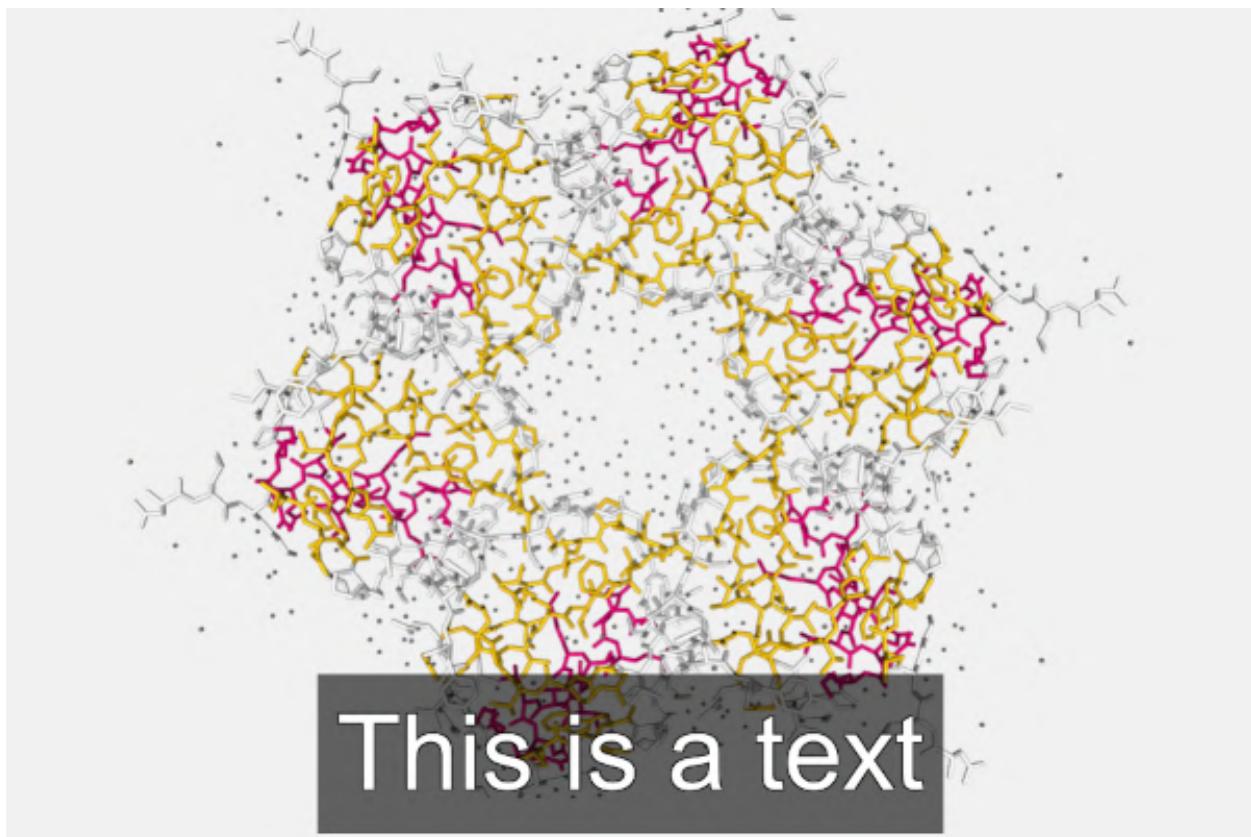
Description text

This text box allows to **edit** the text shown in the **Timeline**.

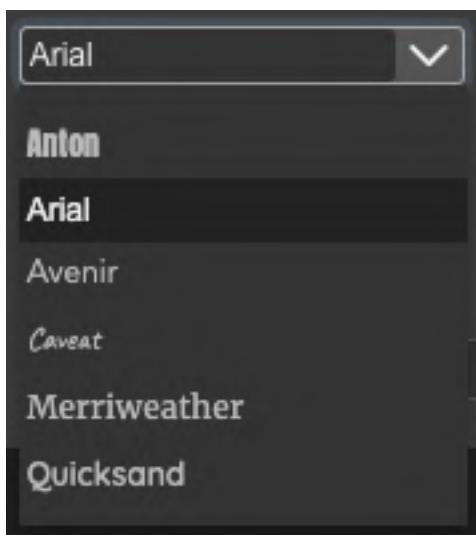


Font size

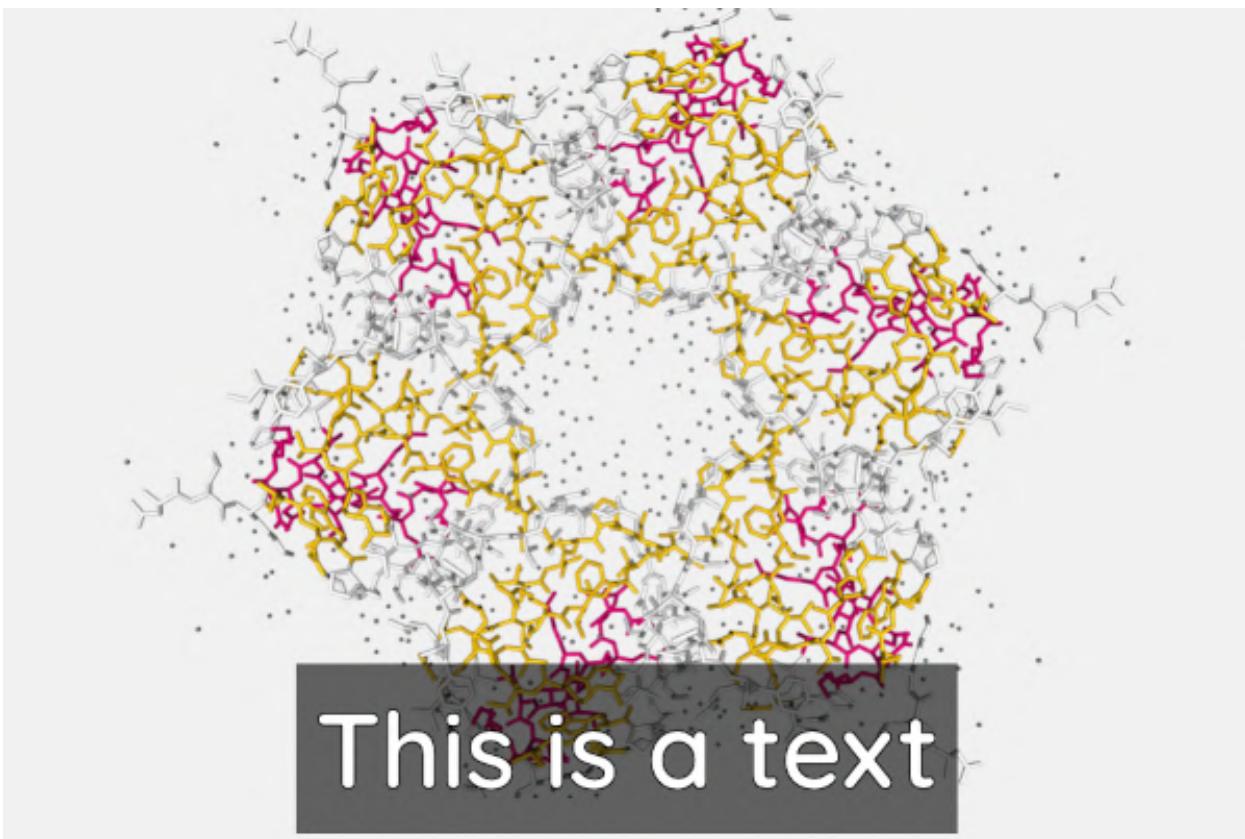
Font size of the text shown in the **Timeline**.



Font family



Font **family** for the text shown in the **Timeline**.

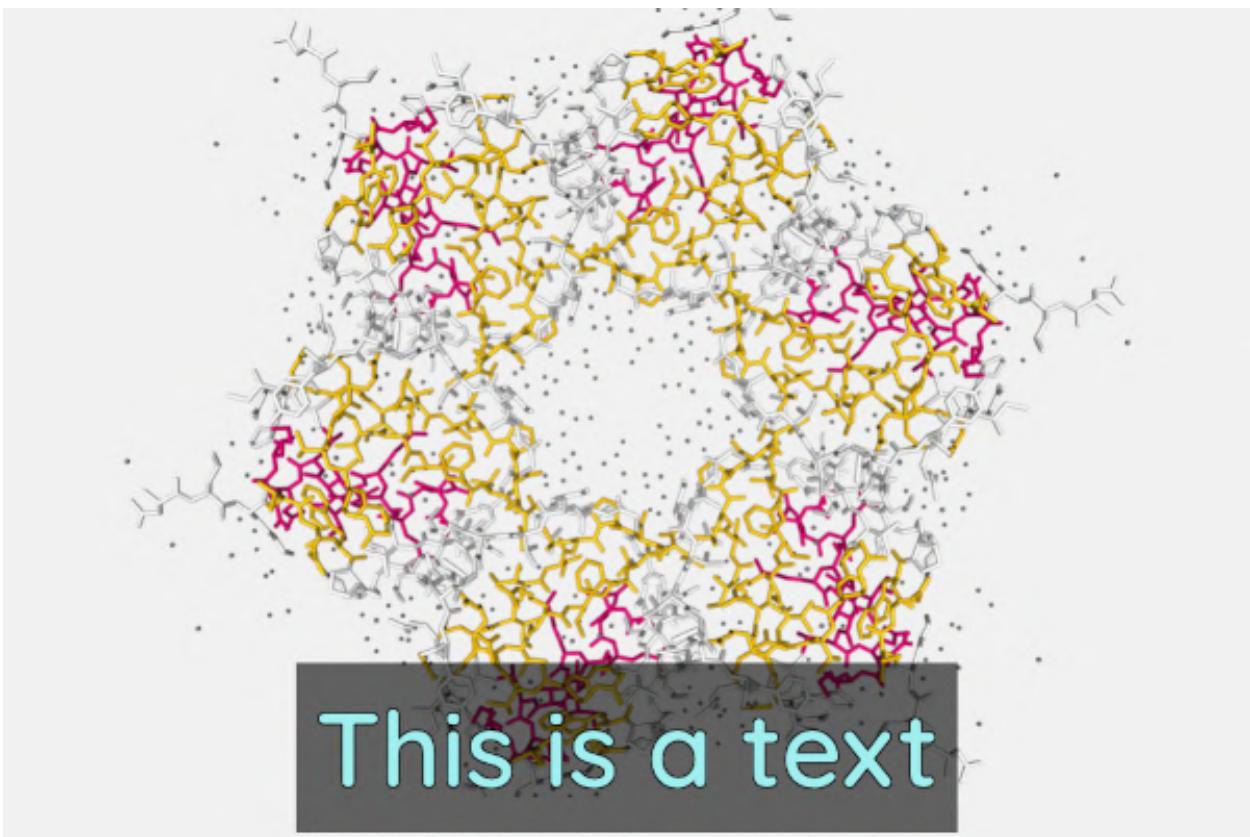


List of available fonts:

- Anton
- Arial
- Avenir
- Caveat
- Merriweather
- Quicksand

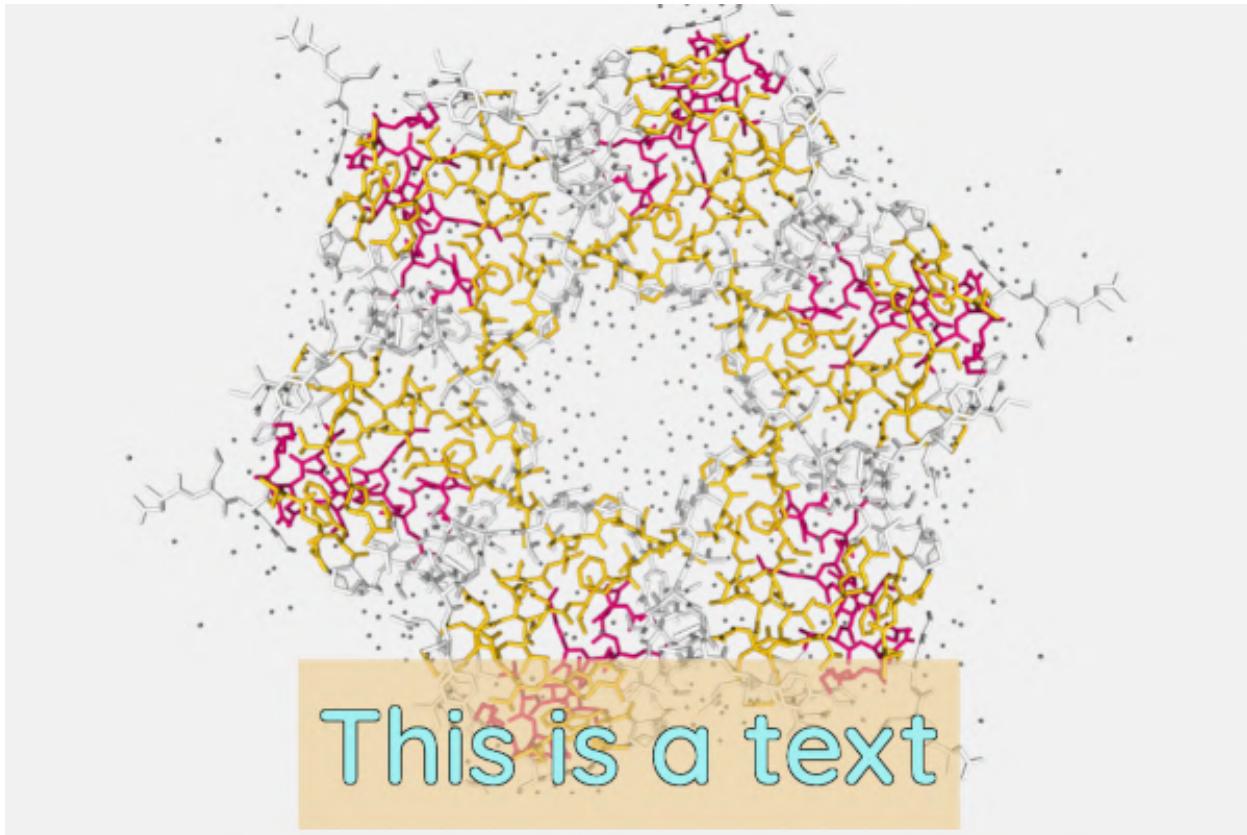
Font Color

Font **color** of the text shown in the **Timeline**.



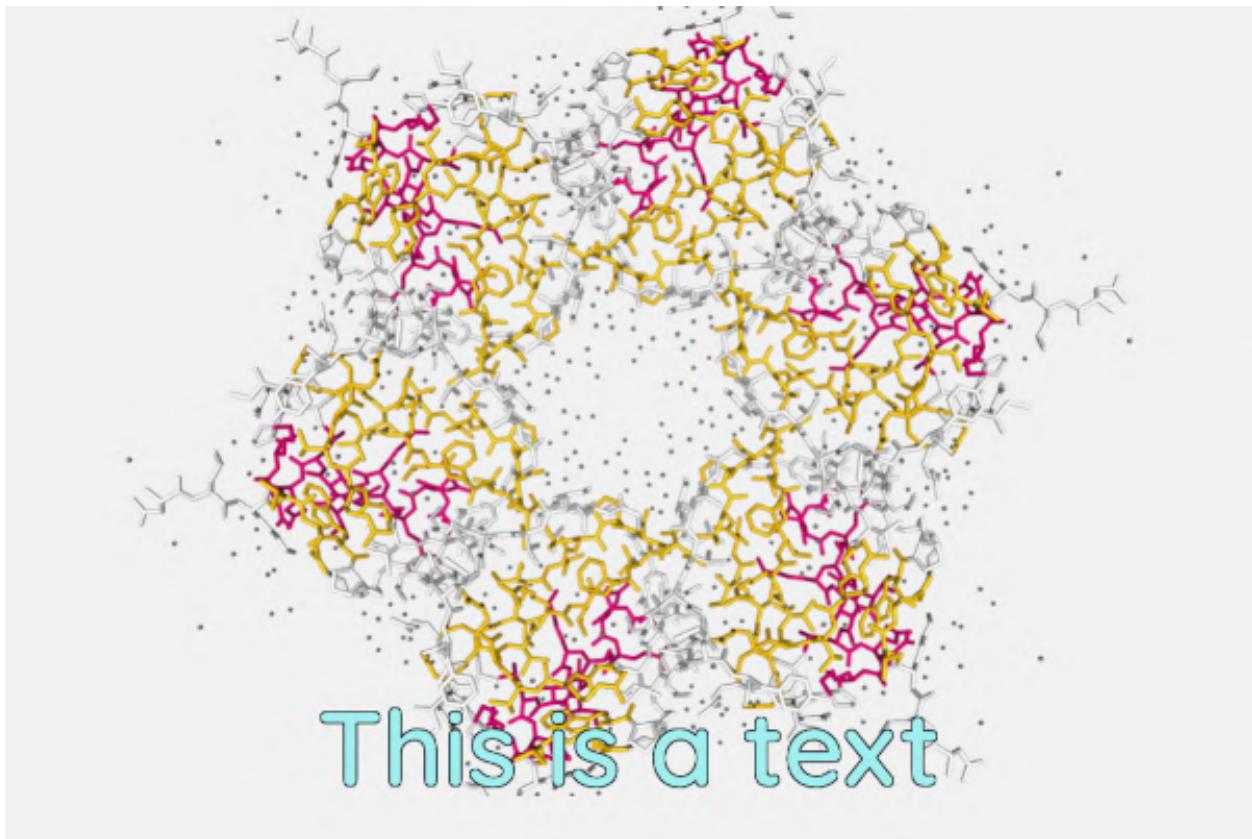
Background Color

Background **color** of the text shown in the **Timeline**.



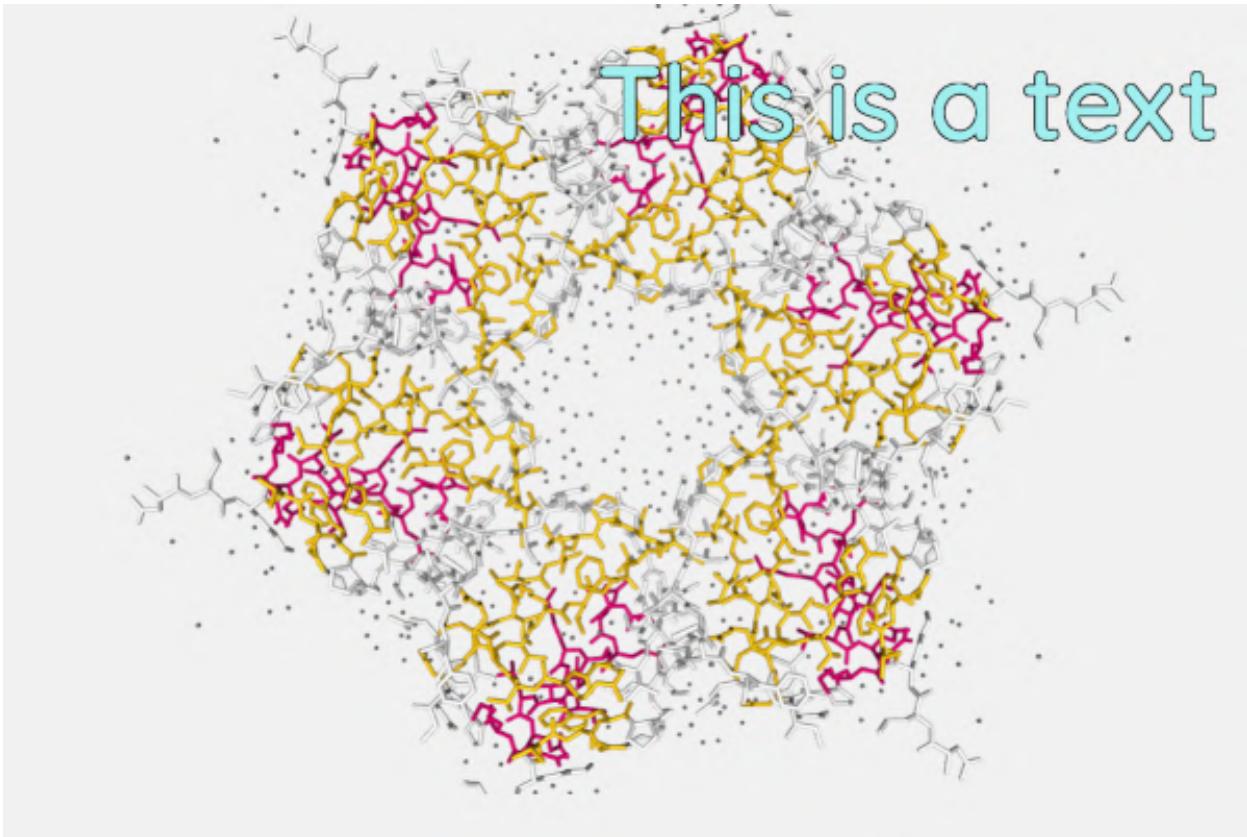
Background Visibility

Wheter or not to **show** the background of the text shown in the **Timeline**.



Description position

Ubication of the text in the stage.



There is a list of available predefined positions. The **first** parameter is about **vertical** position while the **second** is about the **horizontal** one:

- Top Left
- Top Center
- Top Right
- Middle Left
- Middle Center
- Middle Right
- Bottom Left
- Bottom Center
- Bottom Right

4.4 Status Bar



Status bar

The **status bar** is at the **bottom** of the application. It can be **enabled / disabled** via menu (*View > Status Bar*)

4.4.1 Tips



This section of the **status bar** shows **tips** depending on the area of the application where the mouse is located. There are tips for:

- Stage
- Tools
- Controls
- Timeline
- Splitter

4.4.2 Project status



This section of the **status bar** shows the current **status** of the project: either the last time it was saved or a prompt warning that the project hasn't been saved yet.

4.4.3 Version



This section of the **status bar** shows the current **version** of the application.

4.4.4 Theme



Clicking on this section of the **status bar** the application theme will toggle between **dark** and **light**. This option can be toggled as well via menu (*View > Light Theme* or *View > Dark Theme*)

Shortcut: $\text{Esc}/\text{Alt} + \text{Shift} + \text{H}$

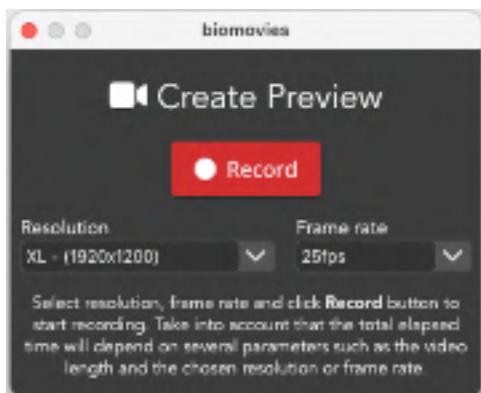
CREATE VIDEOS

The process of **creating a video** with **Biomovies** is really **straightforward**. Once the edition of the movie is finished, just click one of the **three options** available to start recording.

5.1 Create New Preview

A preview is, in fact, a **screen record**. **Biomovies** plays the **Timeline** in real time and records it. Thus, the resolution is not standard, but **depends on your screen**.

For recording a **New Preview**, go to menu *Create Video > New Preview* or use the shortcut **⌘/Ctrl + P**. This action will put **Biomovies** in full screen and will open a **new window** as well.



In this new window, users can choose the **resolution** and the **frame rate** for the new video.

- As explained before, the resolution **depends on the screen** on which **Biomovies** is being executed. Therefore, if you have a Full HD monitor, the movie can have this resolution. All the available resolutions have the **aspect ratio** of the screen. There are **four available resolutions**:
 - **XL: screen size width** (**1920x1200** in the figure above)
 - **L: width 1280**, height according to screen aspect ratio (**1280x800** in the figure above)
 - **M: width 1024**, height according to screen aspect ratio (**1024x640** in the figure above)
 - **S: width 800**, height according to screen aspect ratio (**800x500** in the figure above)
- As for the frame rate, users can choose between **25, 20 or 10 frames per second**.

Once the **Record** button is pressed, the **render** process starts. This **render** process consists of recording the movie in **real time**, so it will take the same length of the **Timeline**.

After the **render** process is finished, it starts the **video generation**. This part can take more or less time depending on the **resolution** chosen and the **resources** of the computer where **Biomovies** is being executed. Once the **video generation** is finished, a system dialog is shown to ask the user **where to save** the video.

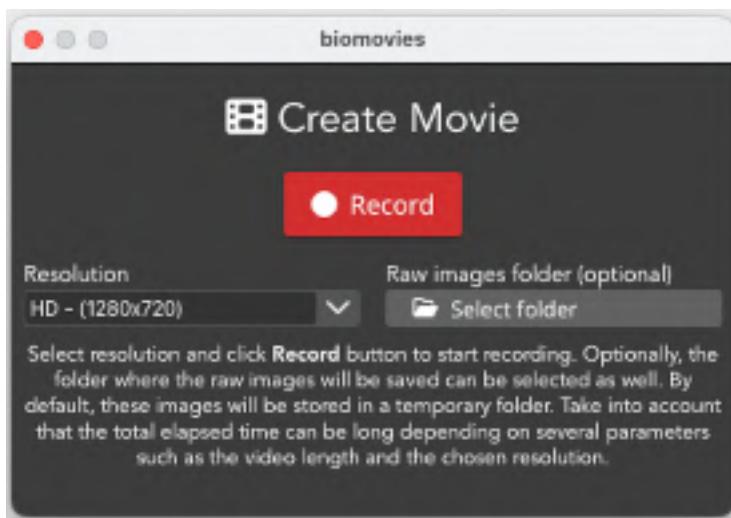
Tip: in **macOS**, the process of recording the screen captures the **mouse** as well, so though this is a **preview video**, if you don't want to see the mouse in the **video**, it's recommended to have it **inside the Create Preview window**. As the application only records the content of the **main window**, the mouse remains **hidden** in the **render process**.

All the **Preview Videos** generated by **Biomovies** are in **MP4** format and **H.264** compression. Take into account that, as the **movie size** depends on the **screen size**, not always the outcome will be a **standard resolution**, for doing that, please *use the Create New Movie option*.

5.2 Create New Movie

The process of the creation of a **New Movie** differs from the **Preview** and the **GIF** in one main feature: in this case, the render process consists of **capturing and saving as images** all the **frames** composing the movie. After saving all this images, the Movie is generated. Thus, the rendering time is **not in real time**, but it depends on the **duration** of the **Timeline**, the chosen **resolution** and the **hardware specifications** of the computer where **Biomovies** is being executed.

For recording a **New Movie**, go to menu *Create Video > New Movie* or use the shortcut **⌘/Ctrl + M**. This action will put **Biomovies** in full screen and will open a **new window** as well.



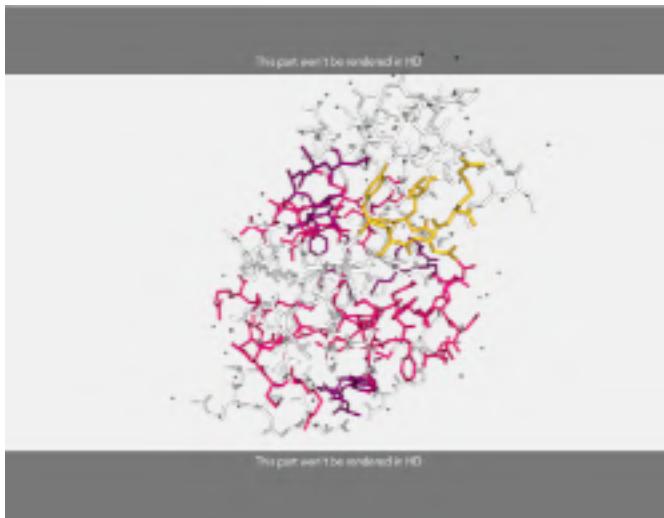
In this new window, users can choose the **resolution** of the new video and, optionally, the **raw images folder** where the rendering images will be saved.

- In this case, the resolution **doesn't depends on the screen** on which **Biomovies** is being executed. Therefore, there are **three available standard resolutions**, all of them with a **16:9** aspect ratio:
 - **HD:** or HD 720p, **1280x720**
 - **FULLHD:** or Full HD 1080p, **1920x1080**
 - **QHD:** or 1440p, WQHD, 2K, **2560x1440**
- Clicking in the **raw images folder** button will allow to save the **render images** in the selected place. Otherwise they will be stored in a **temporary** folder.

Once the **Record** button is pressed, the **render** process starts. This **render** process consists of saving **one image for each frame** of the **Timeline**, so the time it will take depends on **multiple factors**, such as the total **video length**, the chosen **resolution** or the **hardware specifications** of the computer in which **Biomovies** is being executed.

After the **render** process is finished, it starts the **video generation**. This part can take more or less time depending on the **resolution** chosen and the **resources** of the computer where **Biomovies** is being executed. Once the **video generation** is finished, a system dialog is shown to ask the user **where to save** the video.

Tip: it is **highly recommended** to have the *Letterboxing tool enabled* during the process of generating a movie. After enabling it, two **stripes** will appear showing to the user which parts of the stage will be **rendered** and which not. In some cases (when the screen **aspect ratio** is **16:9**) these stripes won't appear.



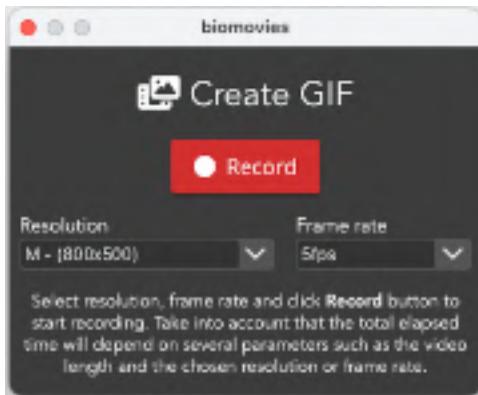
The render process will only take into account the part of the stage between the stripes

All the **Movie Videos** generated by **Biomovies** are in **MP4** format and **H.264** compression.

5.3 Create New GIF

The process of creating a new animated GIF is very similar to the one seen above for creating a *New Preview*. That means, a **screen record**. **Biomovies** plays the **Timeline** in real time and records it. Thus, the resolution is not standard, but **depends on your screen**.

For recording a **New GIF**, go to menu *Create Video > New GIF* or use the shortcut **⌘/Ctrl + G**. This action will put **Biomovies** in full screen and will open a **new window** as well.



In this new window, users can choose the **resolution** and the **frame rate** for the new animated GIF.

- As explained before, the resolution **depends on the screen** on which **Biomovies** is being executed. In this case, and for the sake of the **efficiency**, it is not allowed to generate an animated GIF with the size of the **whole screen**.

Take into account that animated GIFs have not the same **compression** and **quality** of a **MP4 video**. A GIF can be useful for putting a **small video** inside a markdown file, but for showing a long video in **full screen**, use always a video. All the available resolutions have the **aspect ratio** of the screen. There are **four** available **resolutions**:

- **L:** width **1024**, height according to screen aspect ratio (*1024x640* in the figure above)
 - **M:** width **800**, height according to screen aspect ratio (*800x500* in the figure above)
 - **S:** width **640**, height according to screen aspect ratio (*640x400* in the figure above)
 - **XS:** width **480**, height according to screen aspect ratio (*480x300* in the figure above)
- As for the frame rate, users can choose between **2, 5 or 10 frames per second**.

Once the *Record* button is pressed, the **render** process starts. This **render** process consists of recording the movie in **real time**, so it will take the same length of the **Timeline**.

After the **render** process is finished, it starts the **video generation**. This part can take more or less time depending on the **resolution** chosen and the **resources** of the computer where **Biomovies** is being executed. Once the **video generation** is finished, a system dialog is shown to ask the user **where to save** the GIF file.

Tip: in **macOS**, the process of recording the screen captures the **mouse** as well, so if you don't want to see the mouse in the **video**, it's recommended to have it **inside the Create GIF window**. As the application only records the content of the **main window**, the mouse remains **hidden** in the **render process**.

All the **animated GIFs** generated by **Biomovies** are, obviously, in **GIF** format.

UTILITIES

6.1 FAQs

6.1.1 How easy is to install Biomovies?

Biomovies is not difficult to install, however, depending on the version of your operating system, there are some **workarounds** that worth it to take into account. See the documentation for installing in *macOS*, *Windows* and *Ubuntu*.

6.1.2 Which are the software / hardware requirements?

These are the recommended **requirements**:

- ***macOS**: Mac OSX 10.12+ supported, 16GB of RAM recommended
- ***Linux**: Ubuntu 18.04 or greater, 16GB of RAM recommended
- ***Windows**: Windows 10, 16GB of RAM recommended

6.1.3 How to start a new project?

Please visit the *Getting Started section* of the documentation.

6.1.4 How to edit a movie?

Please visit the *Video Editor section* of the documentation. In this section, you will find exhaustive descriptions about all the sections of the editor, such as the *Stage*, the *Timeline* or the *Representations*.

6.1.5 How to export my own videos?

Please visit the *Create Videos section* of the documentation. In this section, there is a broad explanation about how to create a *New Preview* video, a *New Movie* and a *New GIF*.

6.2 Shortcuts

6.2.1 Home screen

Feature | macOS | Ubuntu | Windows

About

Hide biomovies | ⌘H ||

Hide Others | ⌄⌘H ||

Quit biomovies | ⌘Q | Ctrl+Q | Ctrl+Q

Project

New Project | ⌘N | Ctrl+Shift+N | Ctrl+Shift+N

New Project with Trajectory | ⌘T | Ctrl+Shift+T | Ctrl+Shift+T

Open Project | ⌘O | Ctrl+Shift+O | Ctrl+Shift+O

Import Template | ⌘I | Ctrl+Alt+I | Ctrl+Alt+I

Help

Documentation | ⌘D | Ctrl+D | Ctrl+D

6.2.2 Video Editor

Feature | macOS | Ubuntu | Windows

About

Hide biomovies | ⌘H ||

Hide Others | ⌄⌘H ||

Quit biomovies | ⌘Q | Ctrl+Q | Ctrl+Q

Edit

Undo | ⌘Z | Ctrl+Z | Ctrl+Z

Redo | ⌘Z | Ctrl+Shift+Z | Ctrl+Shift+Z

Cut | ⌘X | Ctrl+X | Ctrl+X

Copy | ⌘C | Ctrl+C | Ctrl+C

Paste | ⌘V | Ctrl+V | Ctrl+V

Project

Save Project | ⌘S | Ctrl+S | Ctrl+S

Save Project As | ⌘S | Ctrl+Shift+S | Ctrl+Shift+S

Export Project As Template | ⌘E | Ctrl+Shift+E | Ctrl+Shift+E

Close Project | ⌘W | Ctrl+W | Ctrl+W

View

Stage | ⌄S | Alt+Shift+S | Alt+Shift+S

Timeline | ⌘↑T | Alt+Shift+T | Alt+Shift+T

Representations | ⌘↑R | Alt+Shift+R | Alt+Shift+R

Tools | ⌘↑O | Alt+Shift+O | Alt+Shift+O

Status Bar | ⌘↑B | Alt+Shift+B | Alt+Shift+B

Theme | ⌘↑H | Alt+Shift+H | Alt+Shift+H

Timeline > New Item

Create New Clip | ⌘⌘C | Ctrl+Shift+C | Ctrl+Shift+C

Create New Cloned Clip | ⌘⌘C | Ctrl+Alt+C | Ctrl+Alt+C

Create New Transition | ⌘⌘T | Ctrl+Shift+T | Ctrl+Shift+T

Create New Fade In Transition | ⌘⌘I | Ctrl+Alt+I | Ctrl+Shift+I

Create New Fade Out Transition | ⌘⌘O | Ctrl+Shift+O | Ctrl+Shift+O

Create New Description | ⌘⌘D | Ctrl+Shift+D | Ctrl+Shift+D

Timeline > Controls

Reset Timeline | ⌘⌘R | Ctrl+Alt+R | Ctrl+Alt+R

Pan Mode | ⌘⌘A | Ctrl+Alt+A | Ctrl+Alt+A

Zoom Mode | ⌘⌘Z | Ctrl+Alt+Z | Ctrl+Alt+Z

Timeline > Keyframes Actions

Align to First | ⌘↑◀ | Ctrl+Left | Ctrl+Alt+Shift+Left

Align to Last | ⌘↑▶ | Ctrl+Right | Ctrl+Alt+Shift+Right

Select all Keyframes | ⌘⌘K | Ctrl+Shift+K | Ctrl+Shift+K

Move to Left | ⌘◀ | Ctrl+Shift+Left | Ctrl+Shift+Left

Move to Right | ⌘▶ | Ctrl+Shift+Right | Ctrl+Shift+Right

Timeline > Player Go to First Frame | ⌘▲ | Shift+Up | Shift+Up

Go to Previous Frame | ⌘◀ | Shift+Left | Shift+Left

Play / Pause | ⌘P | Shift+P | Shift+P

Go to Next Frame | ⌘▶ | Shift+Right | Shift+Right

Go to Last Frame | ⌘▼ | Shift+Down | Shift+Down

Create Video

New Preview | ⌘P | Ctrl+P | Ctrl+P

New Movie | ⌘M | Ctrl+M | Ctrl+M

New GIF | ⌘G | Ctrl+G | Ctrl+G

Close Video Window | ⌘W | Ctrl+Shift+W | Ctrl+Shift+W

Help

Documentation | ⌘D | Ctrl+D | Ctrl+D

6.2.3 Specific Trajectory shortcuts

Feature | macOS | Ubuntu | Windows

Decreases initial frame of trajectory | ⌘1 | Ctrl+Alt+1 | Ctrl+Alt+1

Increases initial frame of trajectory | ⌘2 | Ctrl+Alt+2 | Ctrl+Alt+2

Decreases final frame of trajectory | ⌘3 | Ctrl+Alt+3 | Ctrl+Alt+3

Increases final frame of trajectory | ⌘4 | Ctrl+Alt+4 | Ctrl+Alt+4

6.3 Tips

In this section there is a summary of the Tips already explained in the rest of sections.

6.3.1 Stage mouse actions

Mouse drag / wheel

Actions of **zoom in** and **zoom out** can be done with the **scroll mouse or the trackpad** of a laptop, besides, **rotation** and **translation** can be applied as well:

- Clicking on the stage with the **left button** and **dragging will rotate the view**.
- Clicking on the stage with the **right button** and **dragging will translate the view**.
- Mouse wheel (or using the trackpad with two fingers) on the stage will **zoom in** or **zoom out**.

Mouse over actions

Passing the mouse over the molecules of the structure will **highlight** them and show **their information** in the **legend** on the bottom right of the stage. [Click here](#) to see how to enable the legend.

Mouse click actions

- Clicking with the mouse **left button** on an atom while pressing the **Alt** or **?** key will **place a Label** close to this atom. [Click here](#) to see how to edit labels.
- Clicking **consecutively on two atoms** with the mouse **left button** will draw and calculate the **distance** in **ångströms** between these two atoms. [Click here](#) to see how to edit distances.
- Clicking **consecutively on three atoms** with the mouse **right button** while pressing the **Ctrl** key will draw and calculate the **angle** in **degrees** between these three atoms. [Click here](#) to see how to edit angles.

6.3.2 Modify trajectory range

Apart from the obvious range slider, there two more ways available in order to modify the trajectory range:

- On the one hand, **both of the numbers** at the right top of the range are **editable**. Click on both of them in order to introduce the desired frame.
- On the other hand, **range values** can be adjusted via **keyboard** with the following shortcuts:
 - $\text{⌘}/\text{Ctrl} + \text{↖}/\text{Alt} + 1$ **decreases initial frame**
 - $\text{⌘}/\text{Ctrl} + \text{↖}/\text{Alt} + 2$ **increases initial frame**
 - $\text{⌘}/\text{Ctrl} + \text{↖}/\text{Alt} + 3$ **decreases final frame**
 - $\text{⌘}/\text{Ctrl} + \text{↖}/\text{Alt} + 4$ **increases final frame**

6.3.3 Timeline

Select single clip in Timeline Editor

For **selecting a clip**, click with the **left mouse** button on the clip clicking **Ctrl key** (for any OS) at the same time. A clip can be selected as well just **clicking and dragging** over the **Timeline Editor**, but depending on the amount of clips or transitions and the selected zoom for the editor, it can be difficult to select only the desired clip.

Select clips / keyframes in Timeline Editor

Multiple clips / keyframes can be selected just **clicking and dragging** over the **Timeline Editor**.

Zoom

- The **Timeline Editor zoom** can be applied just clicking **Ctrl** (any OS) and scrolling the **mouse wheel**.
- Once the zoom mode is enabled via **Timeline controls** menu, the **default** zoom type is **Zoom In**. For doing **Zoom Out**, click $\text{⌘}/\text{Ctrl}$.

6.3.4 Splitter

There is a **splitter** between the three main areas of the **Video Editor**. For changing the **size** of any of these **areas**, just put the **mouse over** one of the two splitters, **click** over it and **drag** the mouse.

6.3.5 Theming

At the moment of launching the current release, there are **two themes** available: **Dark** (default) and **Light**. For toggling between them, there are three options:

- Click the **Theme button** on the status bar.
- Via menu: *View > Light / Dark Theme*
- Shortcut: $\text{↖}/\text{Alt} + \text{↑} + \text{H}$

6.3.6 Show / hide Video Editor areas

All the **areas** of the **Video Editor** can be hidden **totally** (via menu or shorcut) or **partially** (via *splitter*) in case of the **Stage**, **Representations** and **Timeline**.

Show Stage

The **Stage** is the only area of the **Video Editor** that can't be totally hidden, because it is the **main area** in the application.

For showing it **occupying the whole application**:

- Via menu: *View > Stage*
- Shortcut: ⌘/Alt + ⌂ + S

It can be partially hidden as well using the *splitter*.

Show / hide Timeline

For showing the **Timeline** (in case it is **totally** or **partially** hidden):

- Via menu: *View > Timeline*
- Shortcut: ⌘/Alt + ⌂ + T

It can be partially shown / hidden as well using the *splitter*.

Show / hide Representations

For showing the **Representations** (in case it is **totally** or **partially** hidden):

- Via menu: *View > Representations*
- Shortcut: ⌘/Alt + ⌂ + R

It can be partially shown / hidden as well using the *splitter*.

Show / hide Tools

For showing / hiding the **Tools**:

- Via menu: *View > Tools*
- Shortcut: ⌘/Alt + ⌂ + O

This menu is **draggable** around all the stage and can be **collapsed / expanded** by clicking twice on the handler.

Show / hide Status Bar

For showing / hiding the **Status Bar**:

- Via menu: *View > Status Bar*
- Shortcut: ⌘/Alt + ⌘ + B

6.3.7 Hide mouse when recording Preview Video or GIF

In **macOS**, the process of recording the screen captures the **mouse** as well, so though this is a **preview video**, if you don't want to see the mouse in the **video** or **animated GIF**, it's recommended to have it **inside the Create GIF / Create Preview window**. As the application only records the content of the **main window**, the mouse remains **hidden** in the **render process**.

6.3.8 Use Letterboxing for creating Movies

It is **highly recommended** to have the **Letterboxing tool enabled** during the process of generating a movie. After enabling it, two **stripes** will appear showing to the user which parts of the stage will be **rendered** and which not. In some cases (when the screen **aspect ratio** is **16:9**) these stripes won't appear.

Remember that the **Letterboxing** is useful only **when recording a Movie**, is not necessary for **Previews** or animated **GIFs**.