Editing kinemages with KiNG

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What is KiNG?

KiNG is a new kinemage viewer / editor that has many of Mage's core features and a few additional capabilities that have not yet made it into Mage. KiNG is the preferred online viewer for MolProbity, so you may have already used KiNG.

Neat things to do with KiNG

KiNG allows you to edit your kinemage in certain ways that would otherwise require hand modification with a text editor. A sampling of the available tools:

- View electron density...
- ...and write out blocks of it in kinemage format!
- Merge existing (sub)groups
- Move lists from one (sub)group to another
- Move subgroups from one group to another
- Create new (empty) groups and subgroups
- Move groups/subgroups/lists from one kinemage to another
- Rearrange the order in which groups and subgroups appear
- Translate, rotate, and scale entire groups/subgroups/lists
- Change the widths of lines and the radii of balls and spheres
- Create a single file that contains multiple kinemages

Most of these tools can be accessed by loading your file into KiNG and selecting the Modify tab (above the list of on/off buttons). KiNG will then display a hierchical view of the contents of your kinemage. Navigate to the part to be modified, and choose an appropriate command from the `Modify` menu. In particular, many different options can be altered using the `Edit properties` command. Use `Cut` and `Paste` to relocate

and merge things, and use `Move up` and `Move down` to change the order they appear in. To edit the properties of single points, select `Edit properties` from the Toolbox and click on the point to be edited.

To view electron density, open the Toolbox and choose the ED Map tool. Click the "Open map" button that appears and select an electron density map file. A new window will appear that allows you to control the extent, levels, and colors of the map. The map follows you as you recenter the view on different parts of the model; to record part of the map permanently, press "Export to kinemage."

To create one file that contains multiple kinemages, start KiNG and use the `File | Open` command to open each individual kinemage, in the order in which you wish for them to appear in the final file. If you look in the drop box in the upper-righthand corner of the KiNG window, you should get a list of kinemages (Kinemage 1, Kinemage 2, *etc.*) to choose from. If you made a mistake, select the kinemage to get rid of and choose `File | Close` (don't use `File | Close all`!). When only the desired kinemages remain open, choose `File | Save as` to write all of them to disk. Make sure to give the file a new name — KiNG is still under development and could write out a "damaged" kinemage, so you don't want to overwrite your originals!

There are a few other things that are possible in Mage, but may be easier in KiNG:

- Rename and rearrange views (`Views | Edit saved views`)
- Make your kinemage display a white background, use realistic perspective, or draw all lines as thin by default (select the kinemage in the Modify pane and choose `Edit properties`).

How to access KiNG

Log in to one of the Linux machines in the Richardson lab (as user `bch222`). Either type "king" from the command prompt or click the big purple K on the button bar at the bottom of the screen. While you can test out these editing features using the online version of KiNG in MolProbity, you won't be able to save your modified file. This is due to a security restriction that web browsers place on Java applets, and there's no good way to get around it.

Getting help with KiNG (and reporting bugs)

Come see Ian Davis (my office is 208B Nanaline Duke, in the Richardson lab) or send me email at ian.davis@duke.edu. Also, KiNG has a fairly comprehensive manual and tutorial that can be accessed from the `Help` menu. Please, please, please report any problems you have in using KiNG. Even if the problem you describe isn't actually due to the software malfunctioning, it gives me a clue that things could be redesigned and made easier to use!

Getting KiNG for your own computer

At the present time, we don't distribute KiNG publicly. However, it's written in Java and can run under Windows, Mac OS X, and Linux. If you'd like your own copy of KiNG, talk to Ian.