This tutorial contains navigation buttons that enable you to move throughout the tutorial.

Please use the navigation buttons and not the page up/page down or arrow keys to navigate through the tutorials.

This is the 'Next' button. It takes you to the next frame or stop point.

This is the 'Previous' button. It takes you to the previous frame or stop point.

This is the 'Go to frame' button. It takes you to a specified frame.

This is the 'Go to URL' button. It takes you to a website link.

Press the 'Next' button below to start this tutorial.
This tutorial covers how to align to images and then export the shifted and cropped data.

NOTES:
-This panel is experimental. The results will be accurate within a few microns as long as you have features you can align to.
- In order to align ToF-SIMS images you need to make sure that the raster settings for all collected images are similar and that the data is collected at the same pixel resolution.

This panel allows the user to align any two images and crop them to the same size. The images can then be used for further processing as desired.

This panel only allows shifting in X and Y. It does not do image rotation.

It is important that the images you are using have at least some discernible features that can be used for alignment.

Potential uses of this panel include aligning high mass and high spatial resolution images taken from the same spot, or aligning optical microscopy images with SIMS images so you can later use the optical images as ROI masks.
Open the panel by selecting 'Align Images' from the 'Data Pre Processing' menu.

All images you want to shift must already be loaded into the Imagegui.
This is the image aligner panel.

To start, first select a reference image. This is the image that you will be shifting the other images relative to.

Here we will use a high spatial resolution (HSR) ToF-SIMS image.
Next, select the image you want to shift.

Here we will use a high mass resolution ToF-SIMS image from the same spot as the HSR image.
Once both images are loaded the original images will be shown above and an overlay of the both images will be shown here.

Image 2 (image to shift) is shown overlaid on image 1 (reference image).
This slider allows you to adjust the transparency (alpha value) of image 2. This will make it so you can better see both images in the overlay.
If you move the slider towards '0', image 2 becomes more transparent. Here we have moved the slider to the left and image 2 is barely visible.
Now we have moved the slider to the right and we can see both images clearly.
As can be seen in the overlay, the features in the two images do not overlap.
You can see that the image has shifted and that the features now overlap.

Since this is a manual alignment, there will be some error in the overlay, however it should not be off by more than a few microns.
You can also specify other images that you want to shift the same as image 2 (image to shift). These images MUST already be aligned to image 2.
In addition, you can specify other images that you want to crop to the same dimensions as the shifted image(s). These images MUST already be aligned to image 1 (reference image).
You can choose to 'Export' the data without cropping. This will create a new image matrix where the edges in the areas where the image was shifted contain zeros.
Here we choose to 'Export/Crop' the data. This will export the data after cropping the image(s) to remove any borders created by the image shift. This function forces the final images to be square by cropping to the dimensions of the smallest size of the shifted image.

Any images in the 'Also crop selected ref images' box will be cropped to the same dimensions.
Here you can see the data that has been added to the workspace. The new data is renamed according to the process carried out (i.e. 'Cropped', or 'ShiftedCropped').
The panel can be closed by pressing the 'Close' button.
Data Selection Panel

Name of Image Matrix
Select Data

Name of Variable Matrix
Select Variables

Import Data From Workspace

Press the "Get Variables" button to see a list of all variables in the workspace. Then select a variable and then press the appropriate button to load it into the proper list menu in the "Data Selection Panel".

Get Variables

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</tr>
</tbody>
</table>

Data

Add to Image List
Add to Variable List
Add to Image Overlay List
Add to MAF Scores List
Add to MAF Loadings List
Add to MAF Variance List

If you want to further process the new images in the Imagegui, you must first load them from the workspace (see tutorial 02 on Importing data).
Here we have created an image from both cropped image sets from the high spatial and high mass resolution data.

The images are now showing the same features at the same locations (+/- any alignment error).
That's it for this tutorial.

Press the green button on the left to go back to the previous step. Press the button the right to go back to the beginning of the tutorial.