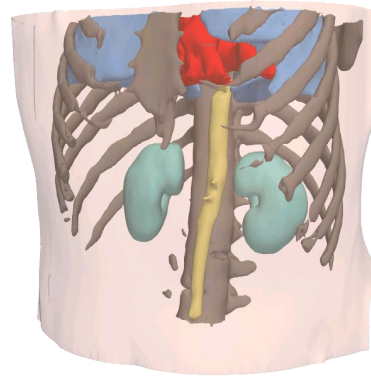
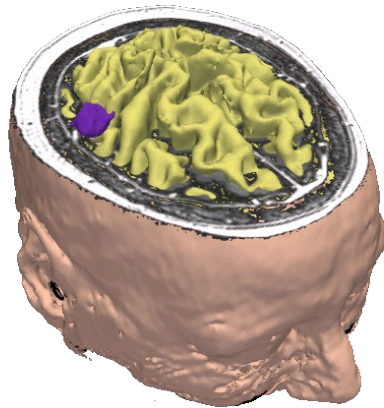




EMSegmenter Tutorial (Simple Mode)

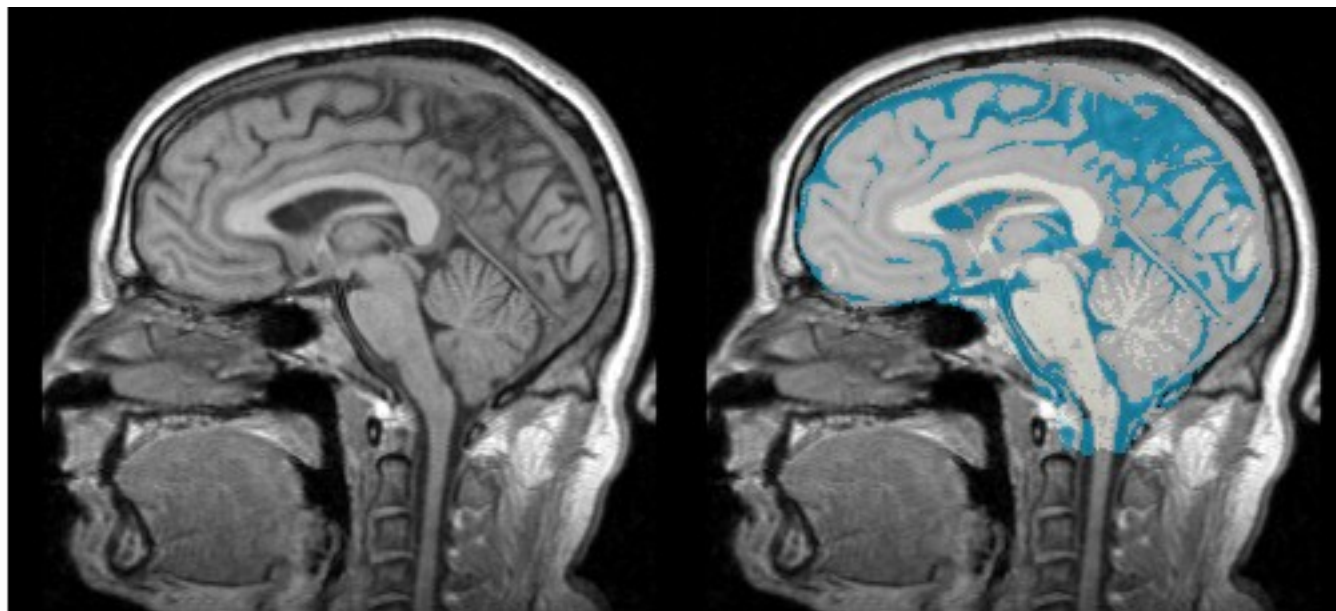


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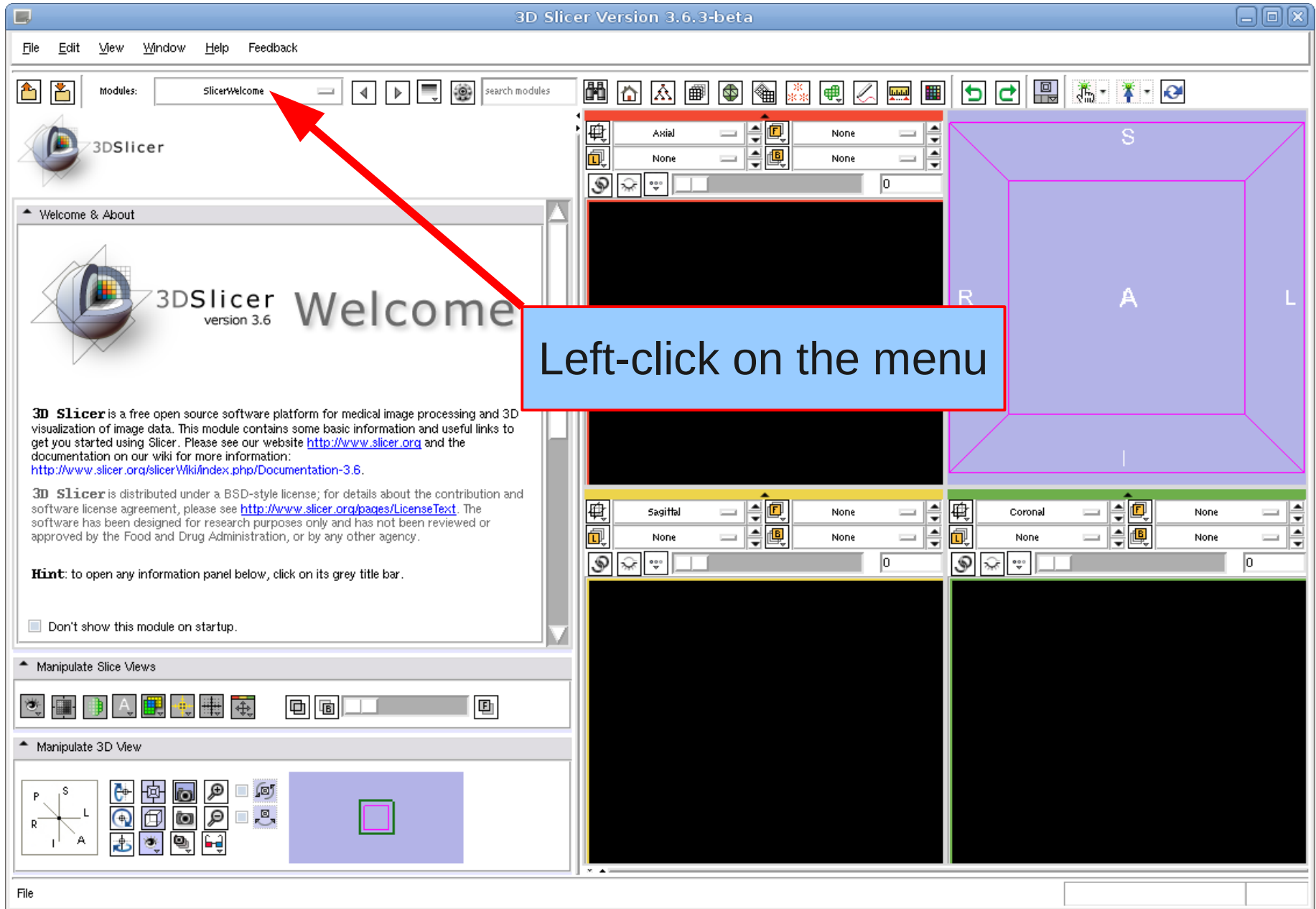
The goal of this tutorial is to apply the EMSegmenter to MRI brain scans. We will segment the clinical T1 scan shown below into **grey matter**, **white matter**, and **cerebrospinal fluid**.

The tutorial is based on Slicer 3.6.2 .



Before

After



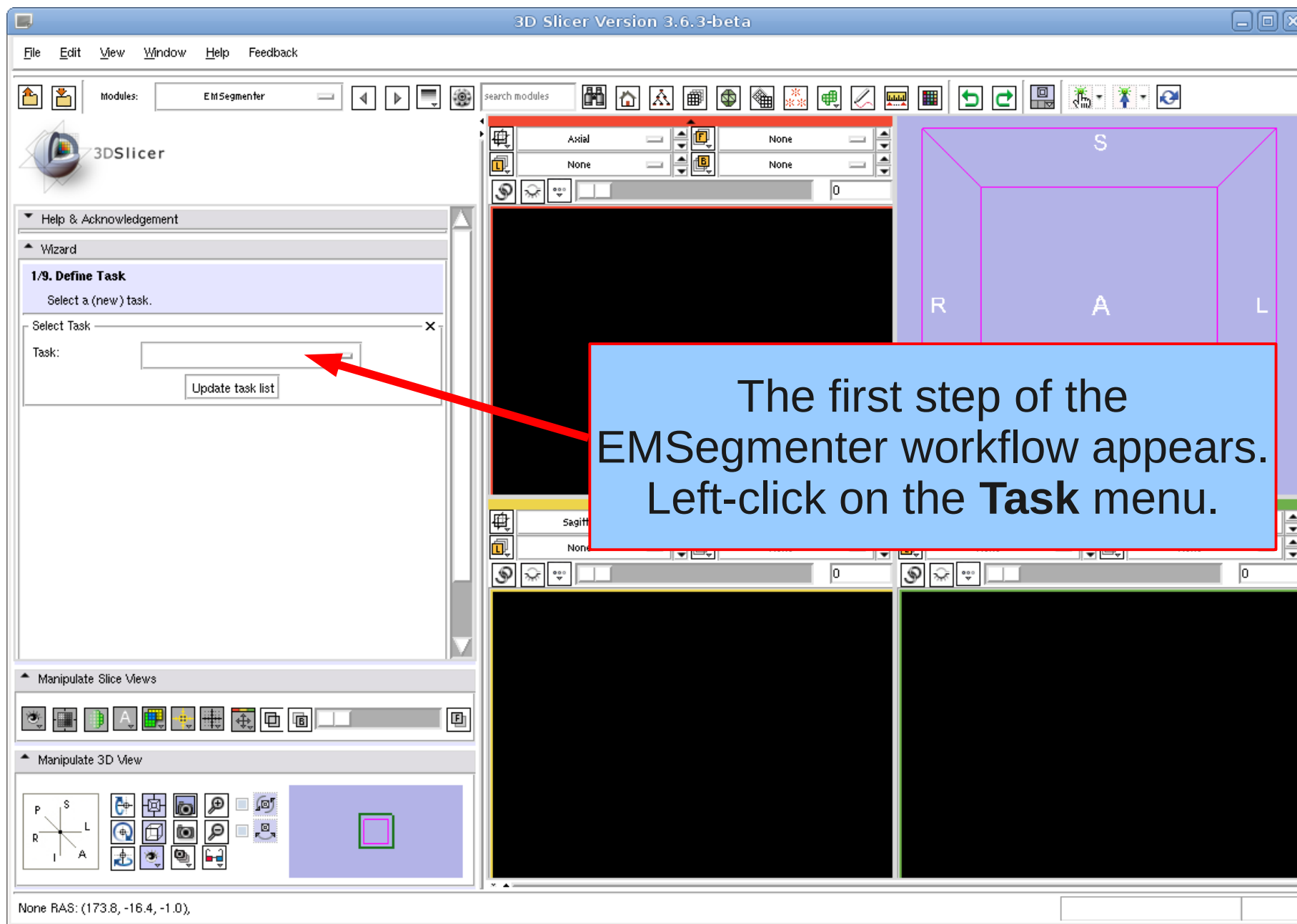


3DSlicer

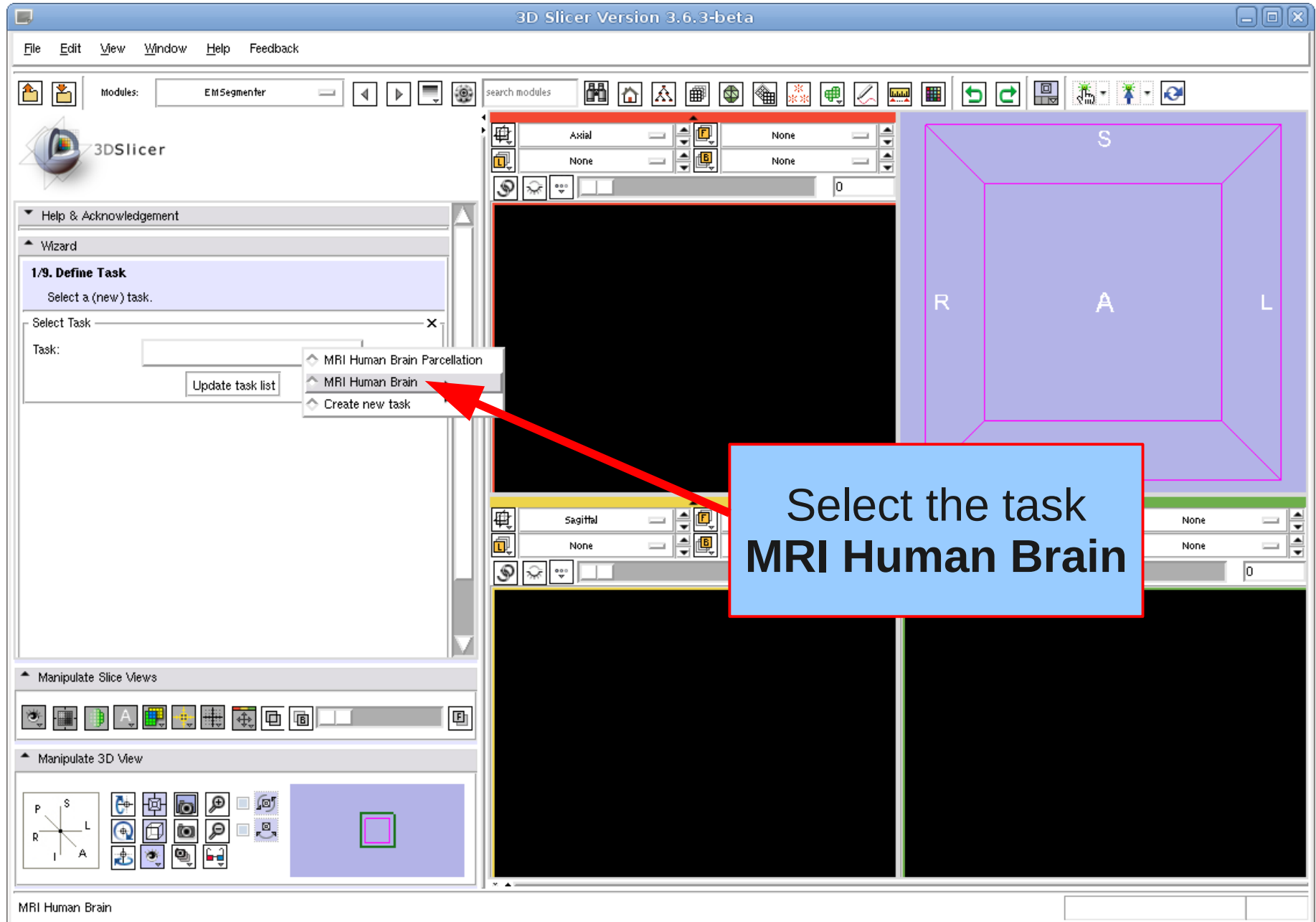
Select EMSegmenter module



The screenshot shows the 3D Slicer Version 3.6.3-beta interface. On the left, the 'Module' list is expanded to 'Segmentation', and the 'EMSegmenter' module is highlighted. A red arrow points from a blue callout box to this module. The callout box contains the text 'Select Segmentation → EMSegmenter'. The main window displays three orthogonal slice views: Axial, Sagittal, and Coronal. The Axial view is highlighted with a red border, and the Sagittal and Coronal views are highlighted with yellow and green borders, respectively. The 3D view at the bottom shows a purple rectangular region on a black background.



Select Task



3D Slicer Version 3.6.3-beta

File Edit View Window Help Feedback

Modules: EM Segmenter

search modules

3DSlicer

Help & Acknowledgement

Wizard

1/9. Define Task

Select a (new) task.

Select Task

Task:

- MRI Human Brain Parcellation
- MRI Human Brain**
- Create new task

Update task list

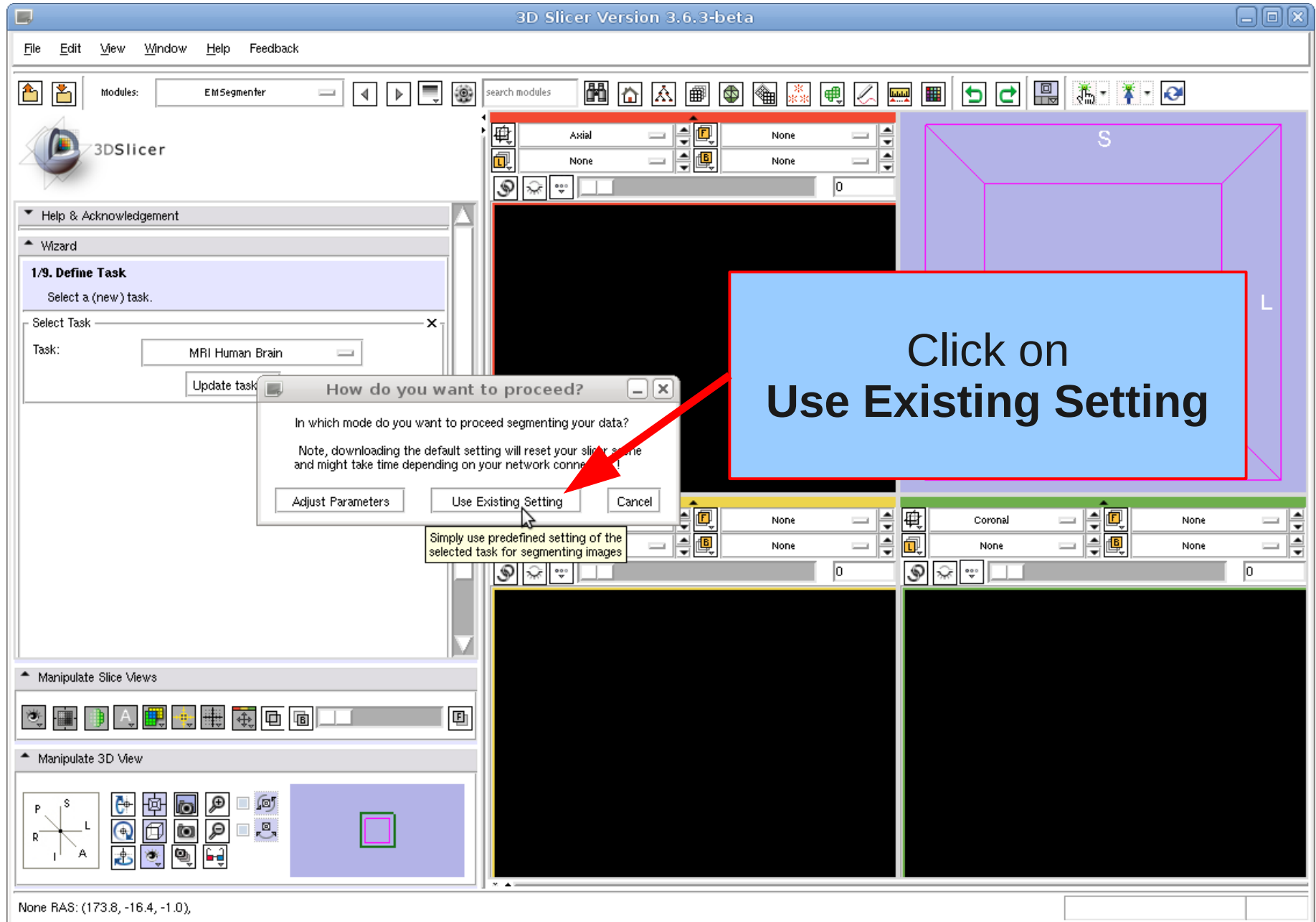
Manipulate Slice Views

Manipulate 3D View

MRI Human Brain

Select the task
MRI Human Brain

Select Task



3D Slicer Version 3.6.3-beta

File Edit View Window Help Feedback

Modules: EM Segmenter

search modules

3DSlicer

Help & Acknowledgement

Wizard

1/9. Define Task

Select a (new) task.

Select Task

Task: MRI Human Brain

Update task

How do you want to proceed?

In which mode do you want to proceed segmenting your data?

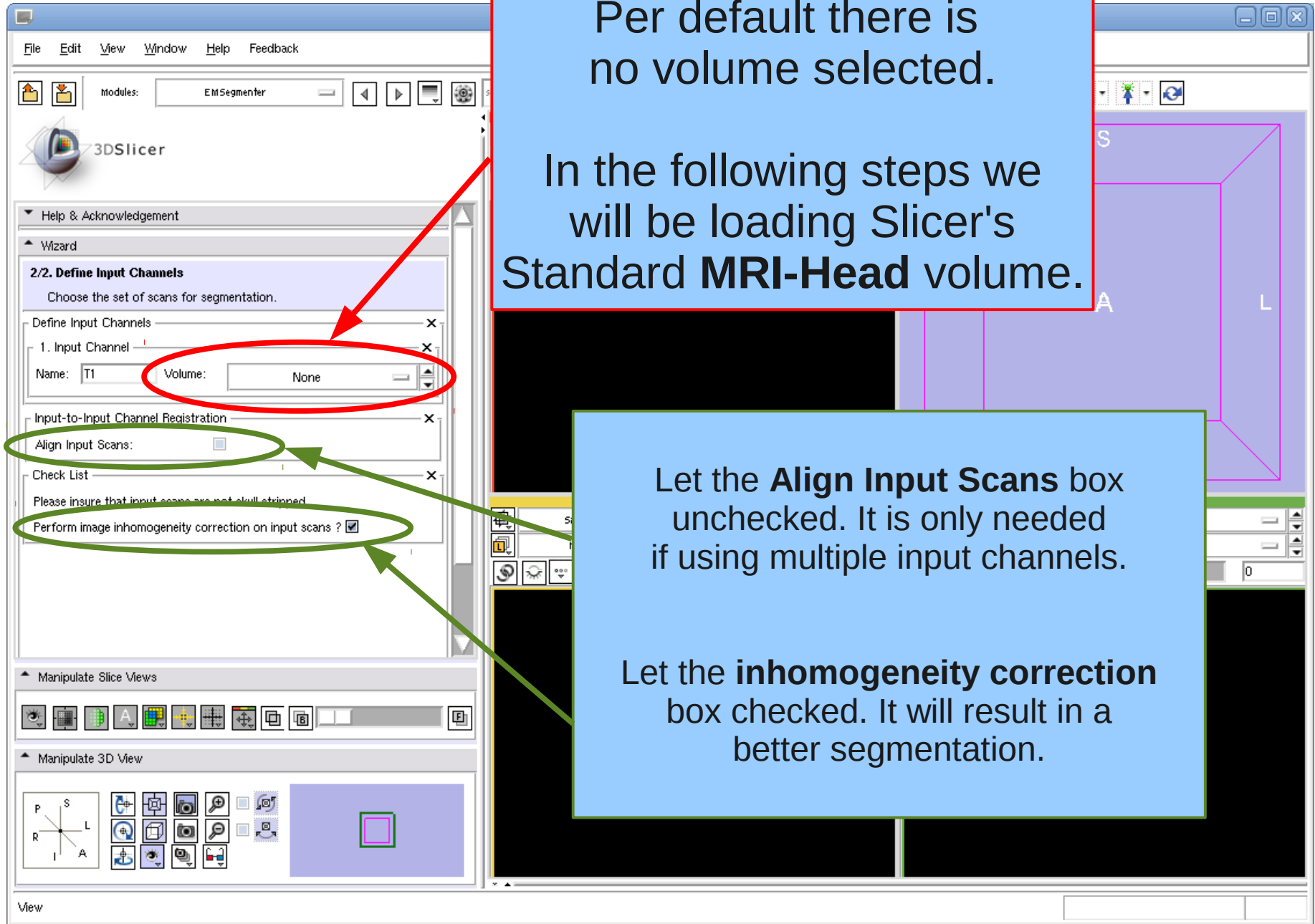
Note, downloading the default setting will reset your slicer scene and might take time depending on your network connection!

Adjust Parameters Use Existing Setting Cancel

Simply use predefined setting of the selected task for segmenting images

Click on Use Existing Setting

None RAS: (173.8, -16.4, -1.0)



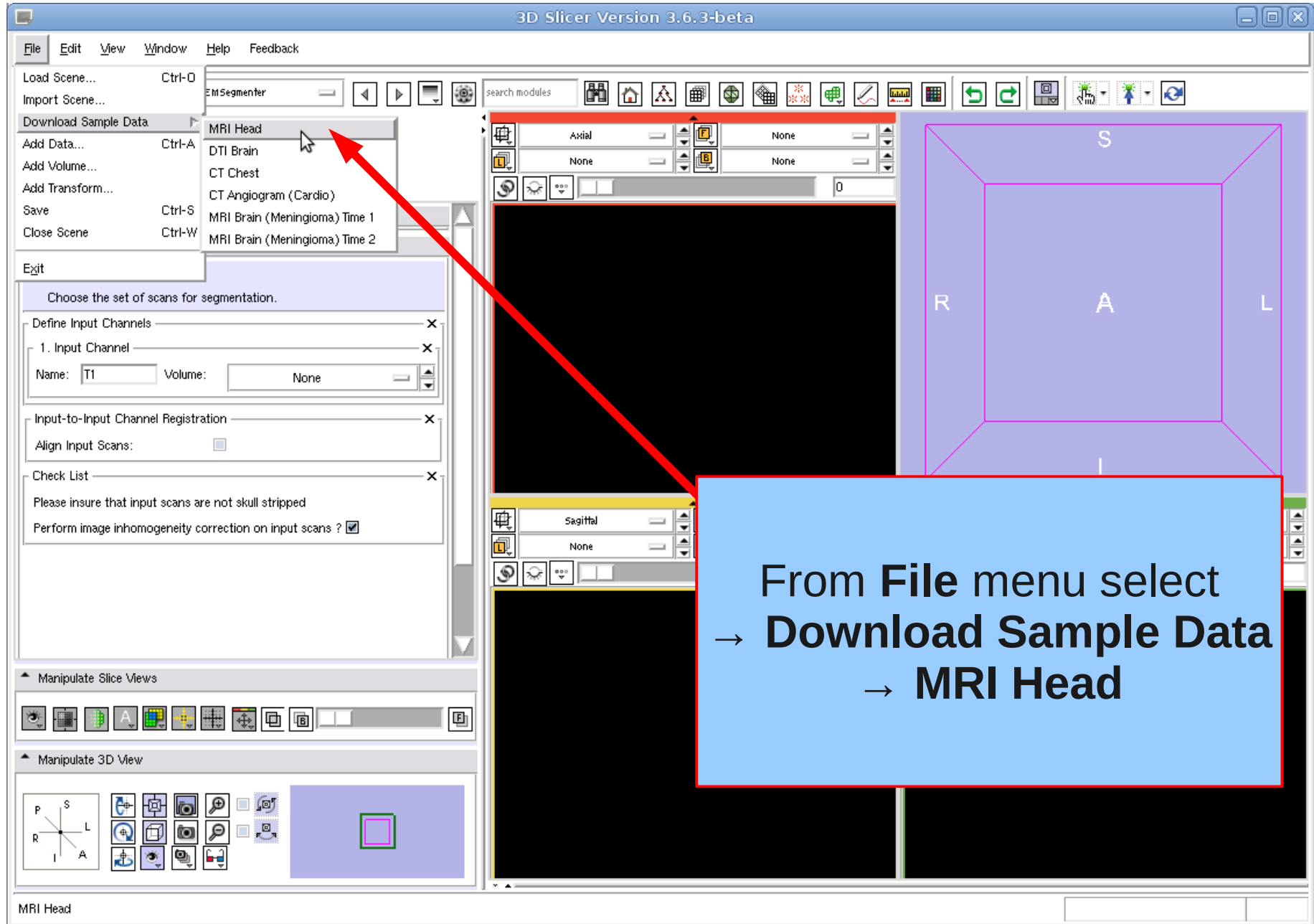
Per default there is no volume selected.

In the following steps we will be loading Slicer's Standard **MRI-Head** volume.

Let the **Align Input Scans** box unchecked. It is only needed if using multiple input channels.

Let the **inhomogeneity correction** box checked. It will result in a better segmentation.

Load subject volume



3D Slicer Version 3.6.3-beta

File Edit View Window Help Feedback

Load Scene... Ctrl-O
Import Scene...
Download Sample Data
Add Data... Ctrl-A
Add Volume...
Add Transform...
Save Ctrl-S
Close Scene Ctrl-W
Exit

EMSegmenter

search modules

Axial None
None None

S
R A L
I

Sagittal
None

Define Input Channels
1. Input Channel
Name: T1 Volume: None

Input-to-Input Channel Registration
Align Input Scans:

Check List
Please insure that input scans are not skull stripped
Perform image inhomogeneity correction on input scans ?

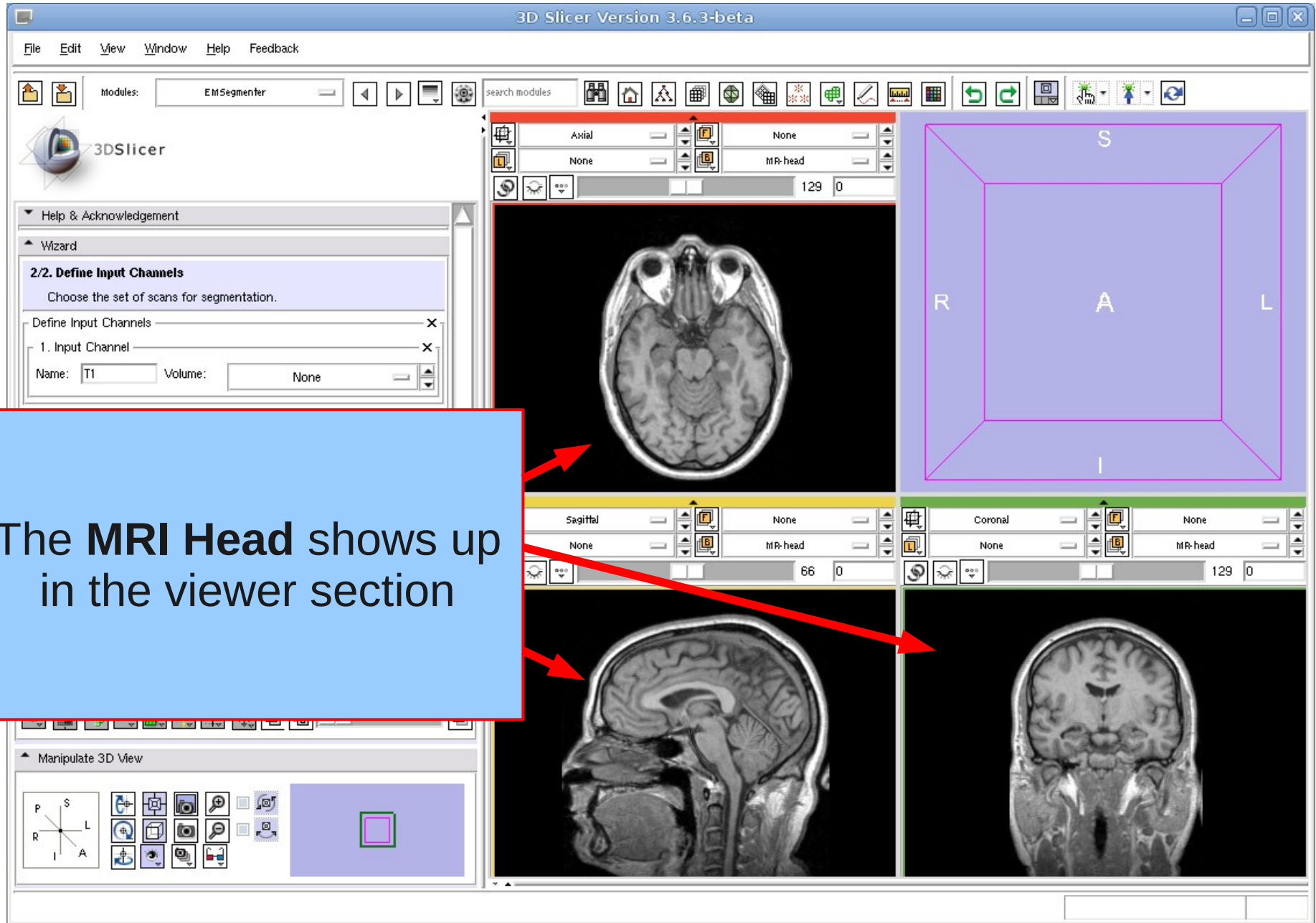
Manipulate Slice Views

Manipulate 3D View

MRI Head

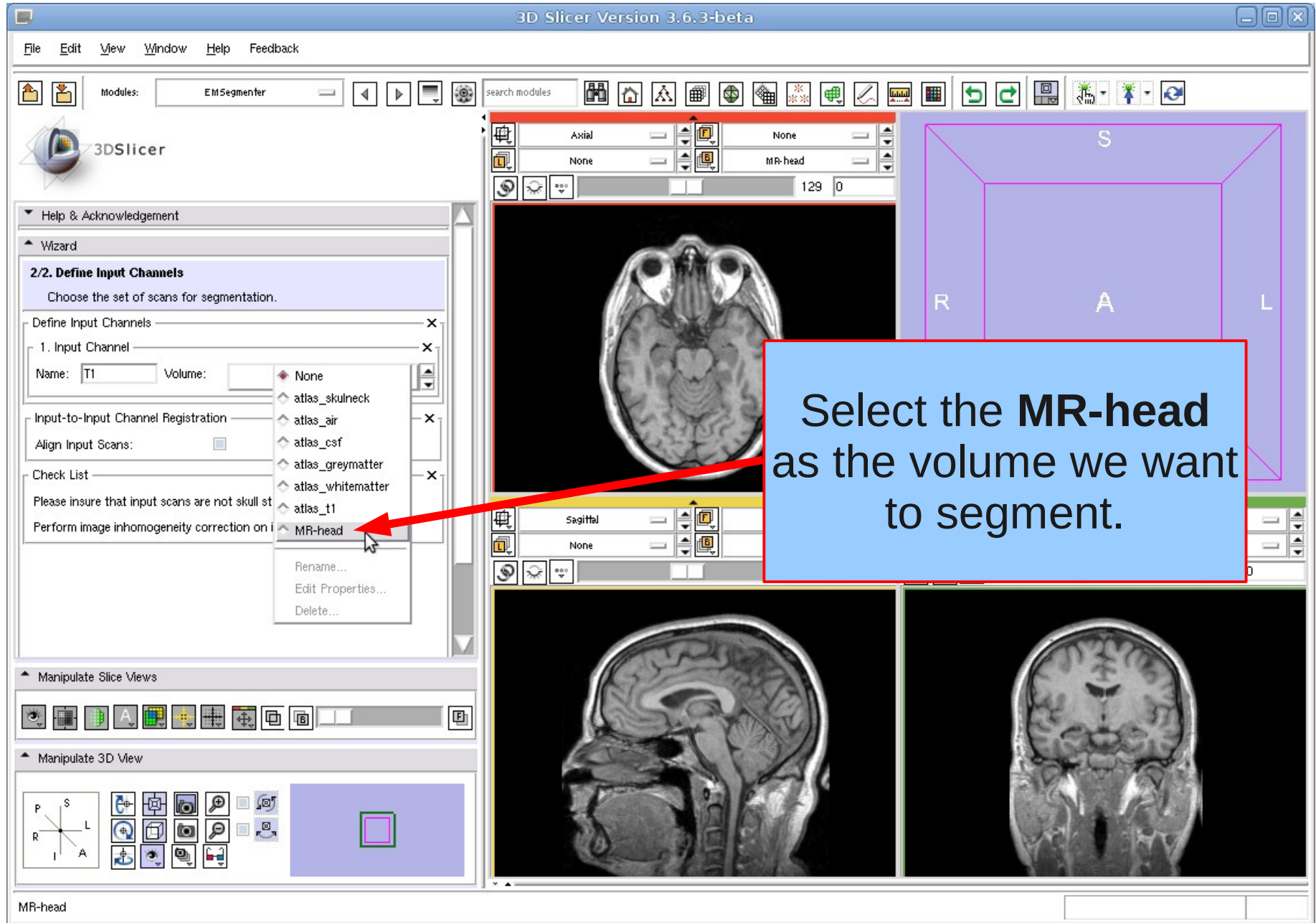
From **File** menu select
→ **Download Sample Data**
→ **MRI Head**

Display MRI Head



The MRI Head shows up in the viewer section

Define Input Channel



3D Slicer Version 3.6.3-beta

File Edit View Window Help Feedback

Modules: EM Segmenter

3DSlicer

Help & Acknowledgement

Wizard

2/2. Define Input Channels
Choose the set of scans for segmentation.

Define Input Channels

1. Input Channel

Name: T1 Volume: None

- atlas_skulneck
- atlas_air
- atlas_csf
- atlas_greymatter
- atlas_whitematter
- atlas_t1
- MR-head**

Input-to-Input Channel Registration

Align Input Scans:

Check List

Please insure that input scans are not skull st

Perform image inhomogeneity correction on i

Rename...
Edit Properties...
Delete...

Manipulate Slice Views

Manipulate 3D View

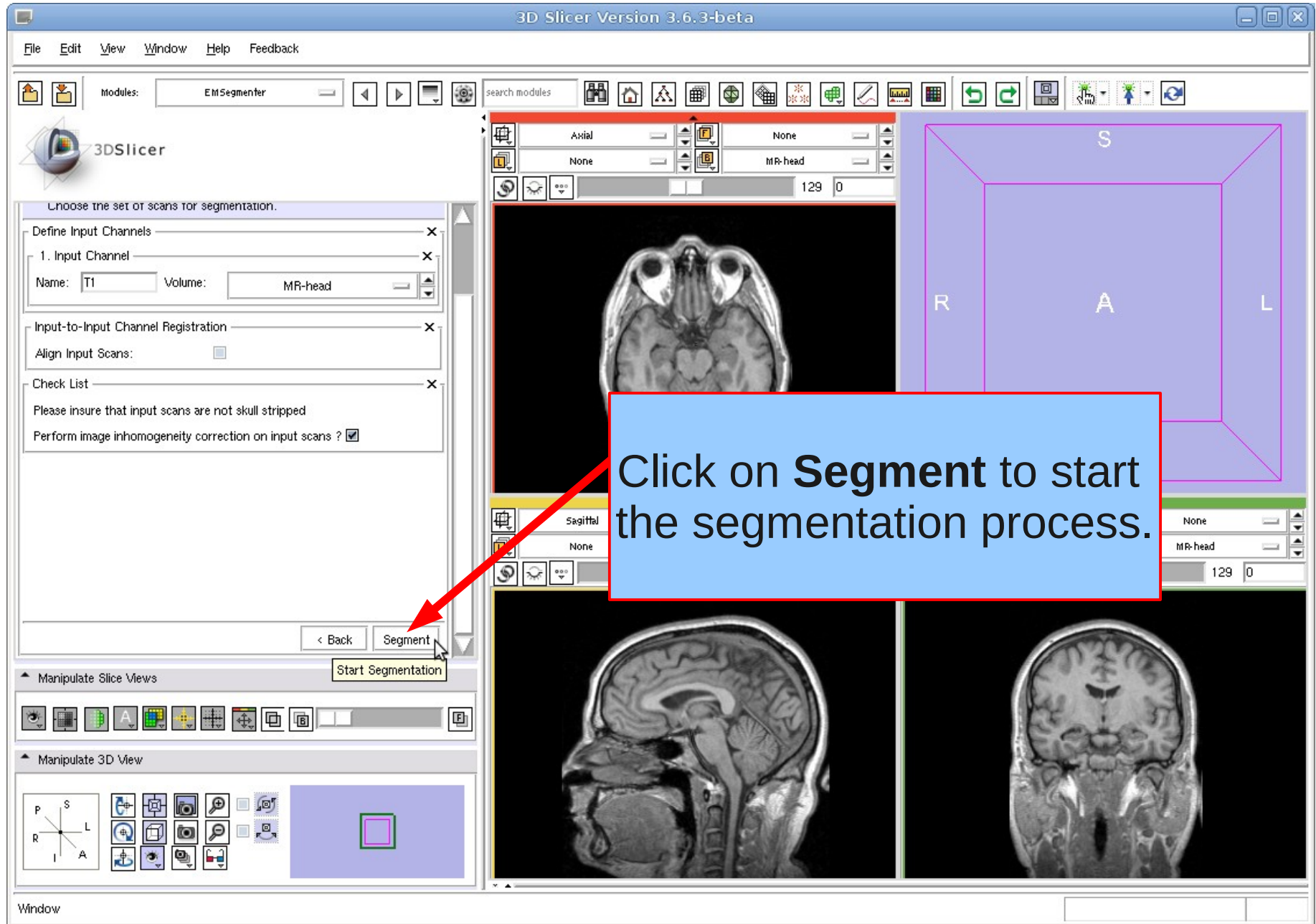
MR-head

Axial None
 None MR-head
 129 0
 Sagittal None

S
R A L

Select the **MR-head** as the volume we want to segment.

Start Segmentation



3D Slicer Version 3.6.3-beta

File Edit View Window Help Feedback

Modules: EM Segmenter

search modules

3DSlicer

Choose the set of scans for segmentation.

Define Input Channels

1. Input Channel

Name: T1 Volume: MR-head

Input-to-Input Channel Registration

Align Input Scans:

Check List

Please insure that input scans are not skull stripped

Perform image inhomogeneity correction on input scans ?

< Back Segment

Start Segmentation

Manipulate Slice Views

Manipulate 3D View

Window

Axial None

None MR-head

129 0

Sagittal None

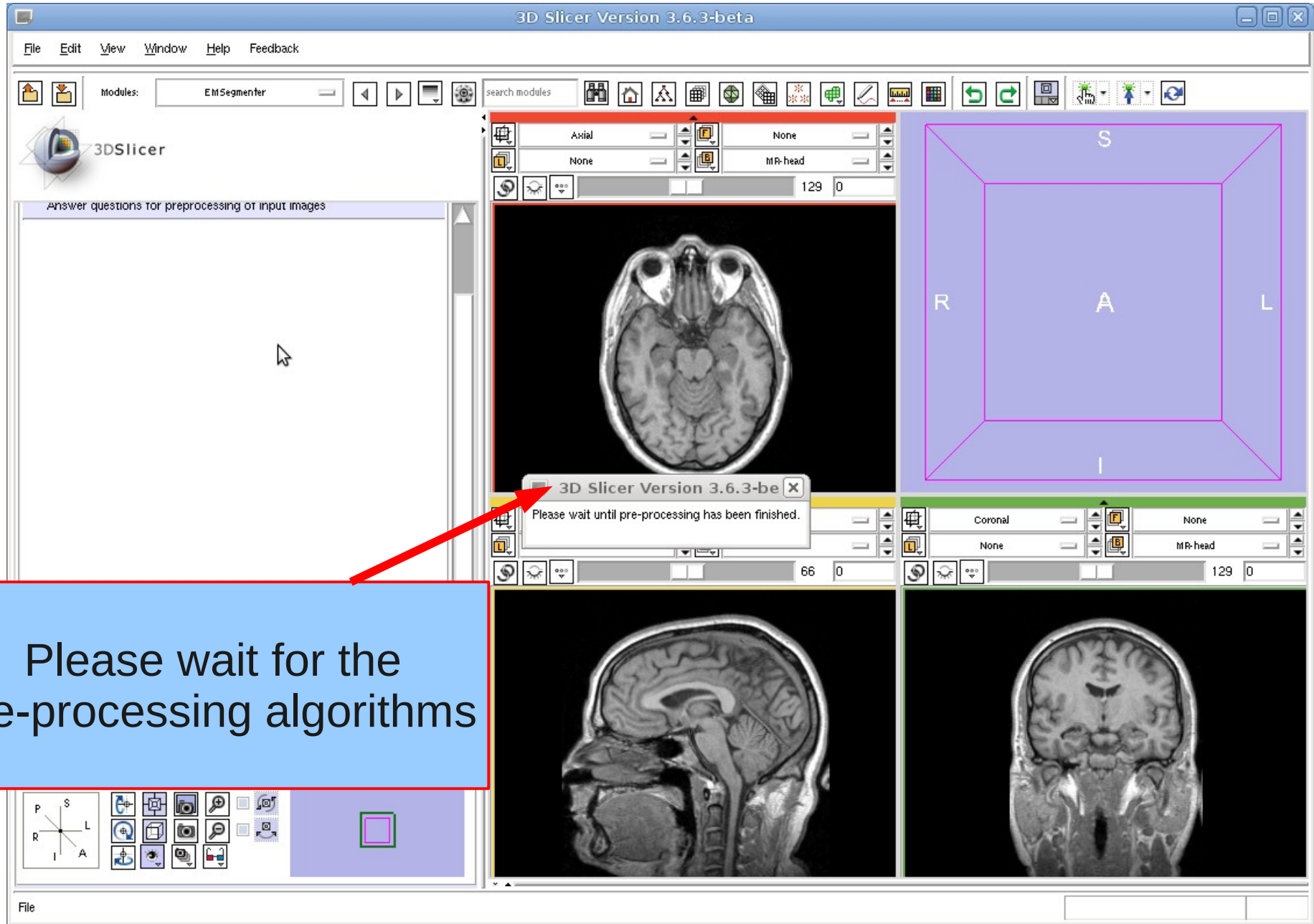
None MR-head

129 0

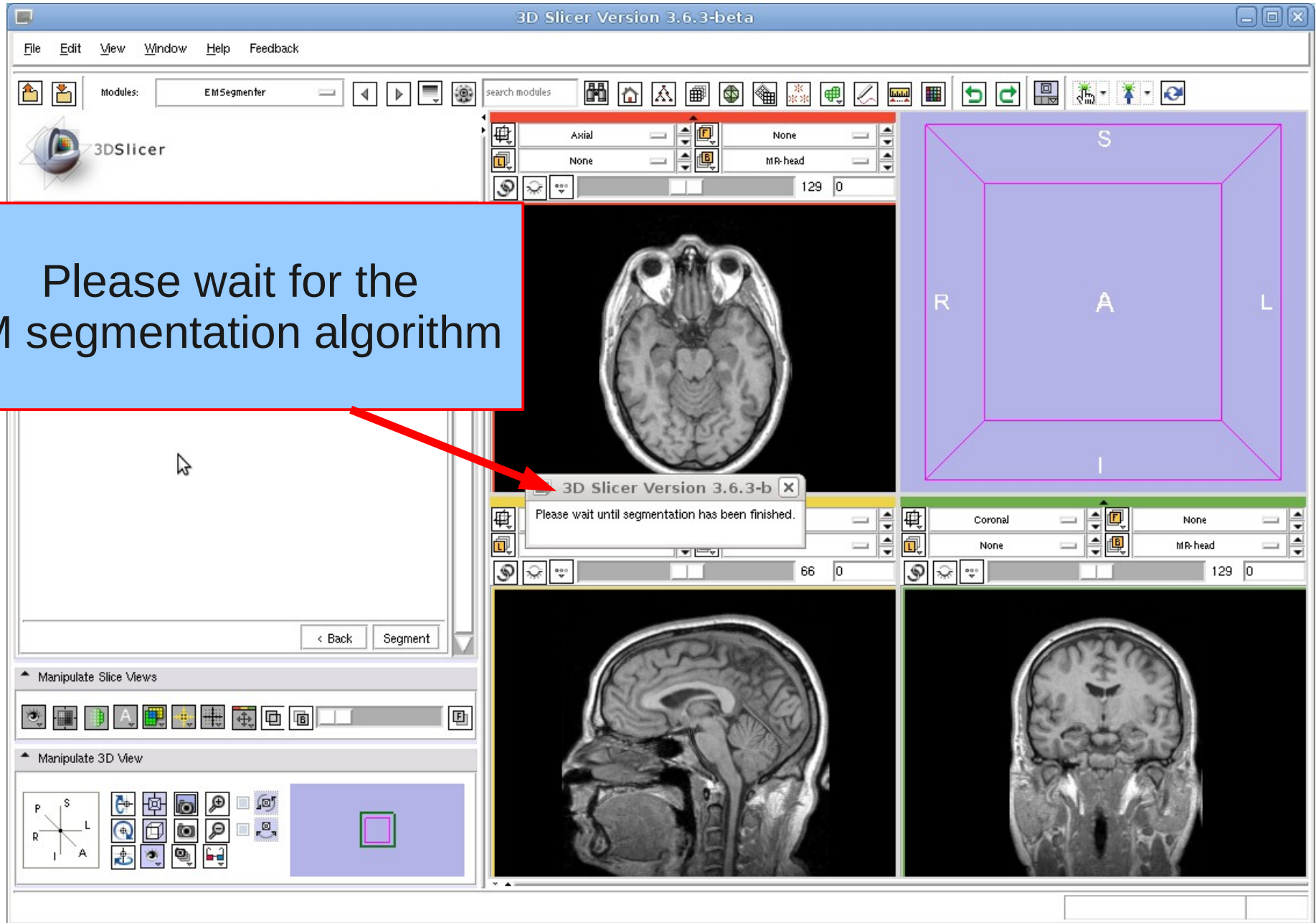
S R A L

P S R L I A

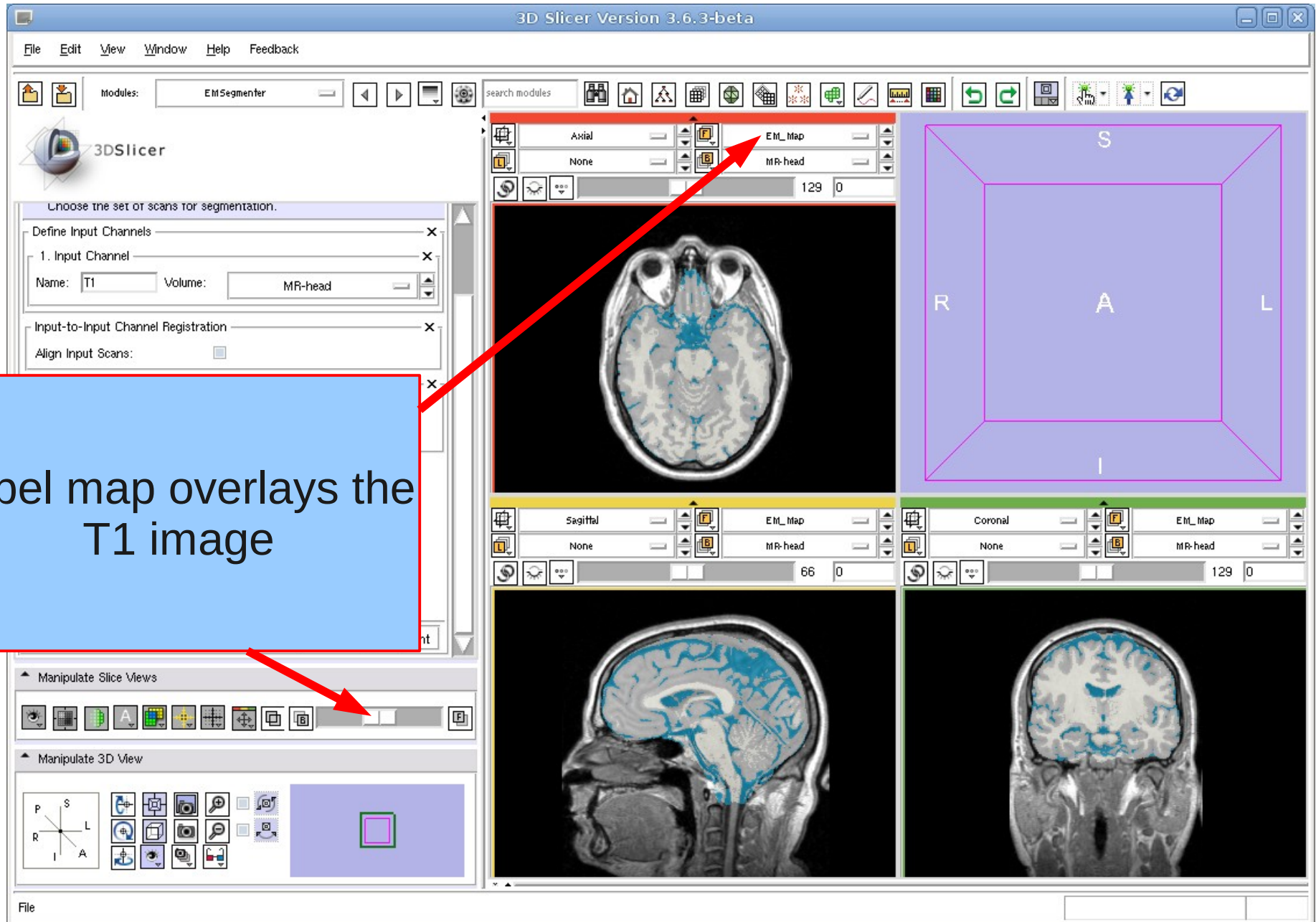
Click on **Segment** to start the segmentation process.



Please wait for the pre-processing algorithms



Result: Label map



Label map overlays the T1 image



EMSegmenter Wiki Page:

<http://www.slicer.org/slicerWiki/index.php/EMSegmenter-Overview>

The EMSegmenter technology behind was reported in:

K.M. Pohl et. A hierarchical algorithm for MR brain image parcellation. IEEE Transactions on Medical Imaging, 26(9), pp 1201-1212, 2007.

We thank the following institutions for their support:

