



Applied Chest Imaging Laboratory

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Body Composition

A Chest Imaging Platform Slicer Extension module

Overview

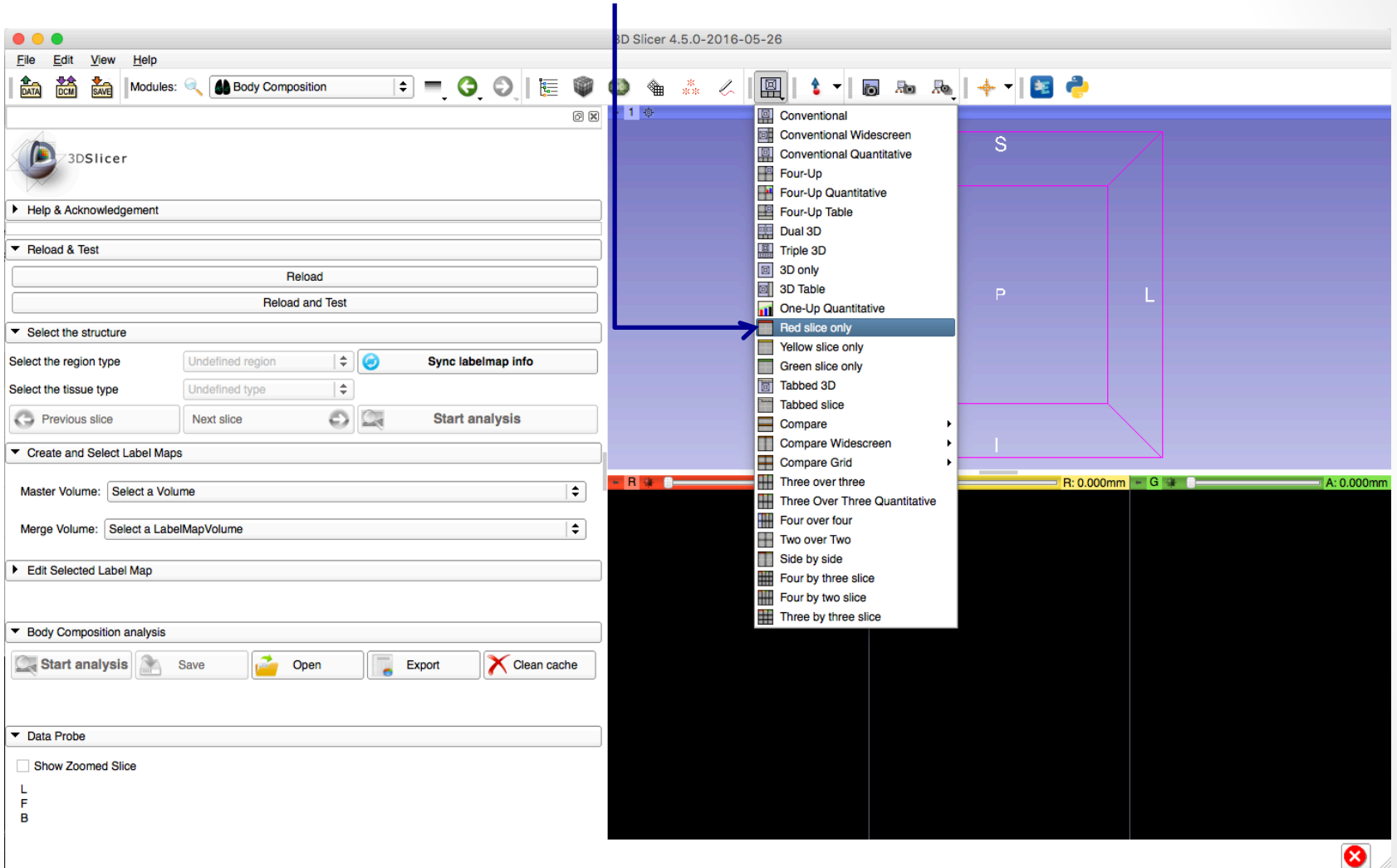
- Goal: Obtain measurements of muscle and fat composition in Chest CT to assess body composition
- The module will enable:
 - Label different lung structures with an optimized version of the Slicer Editor
 - Faster labeling with window contrast levels and label threshold optimized for every structure
 - Run basic statistic analysis for each one of the different structures
 - Export the analysis results to a CSV file, easy to manage for your study



Body Composition

1- Launch Body composition module

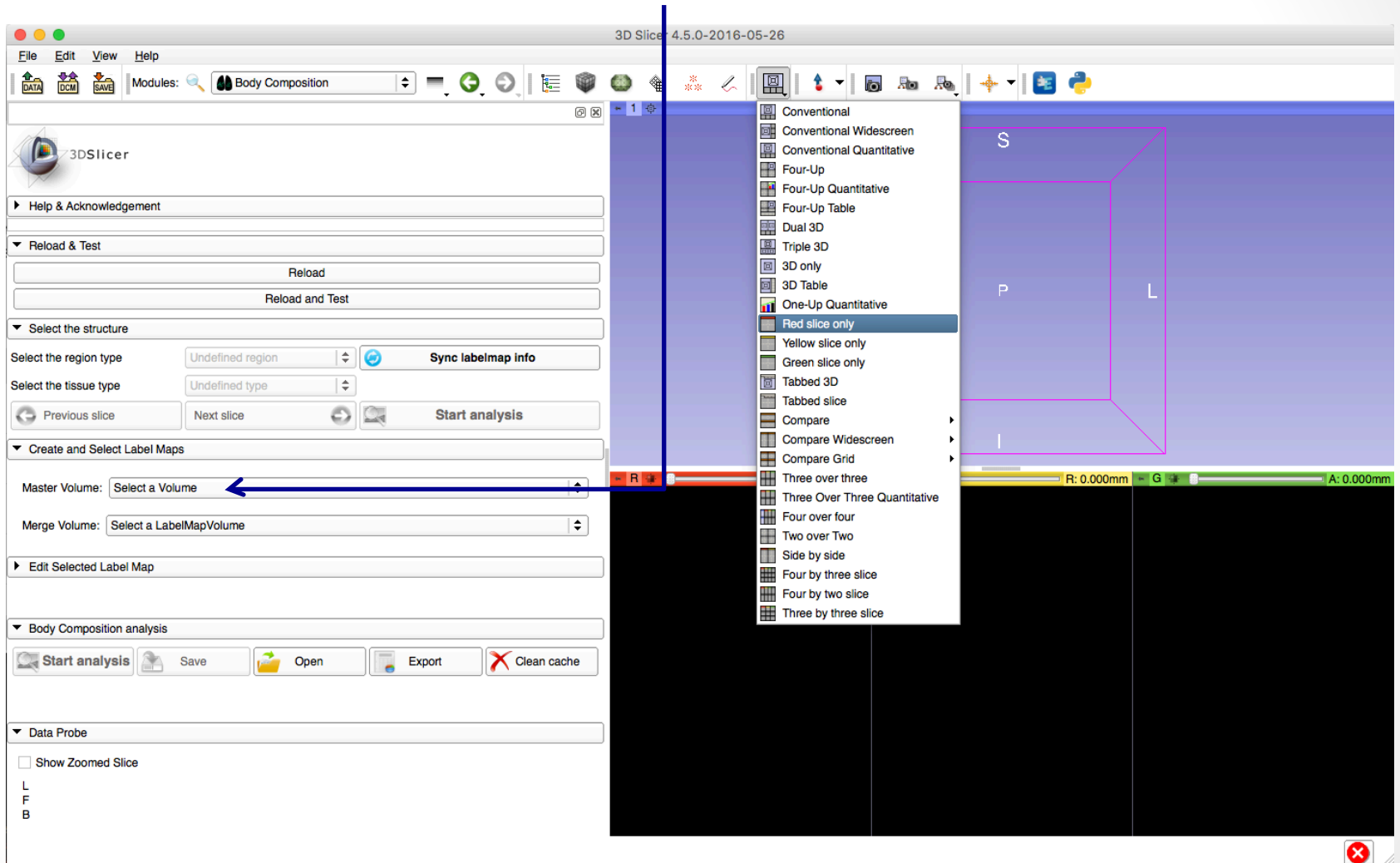
Tip: Axial view is recommended (Red slice only layout)



Body Composition

2- Select an input CT image.

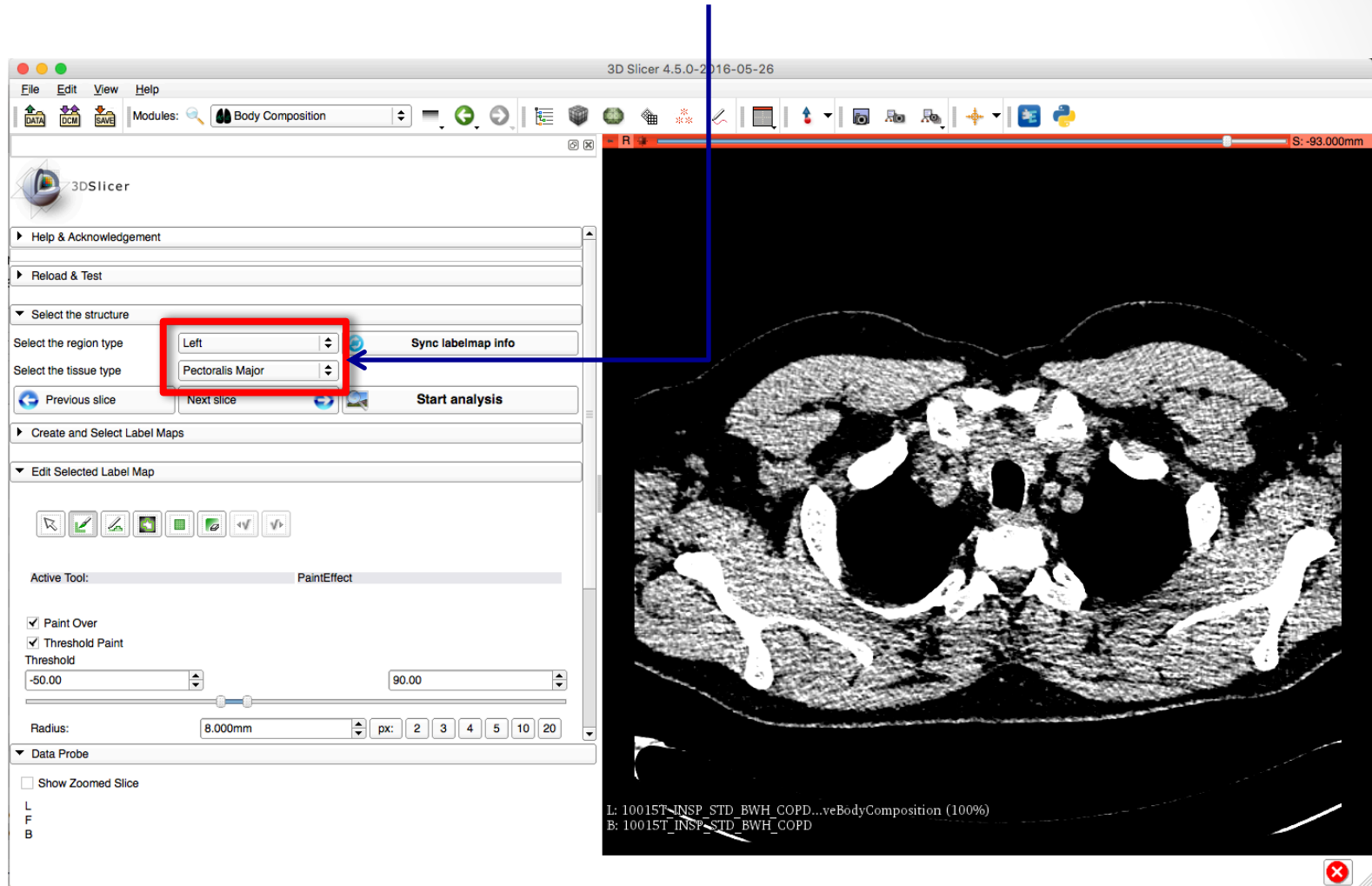
Tip: A default label map will be created



Body Composition

3- Select the structure that you want to label.

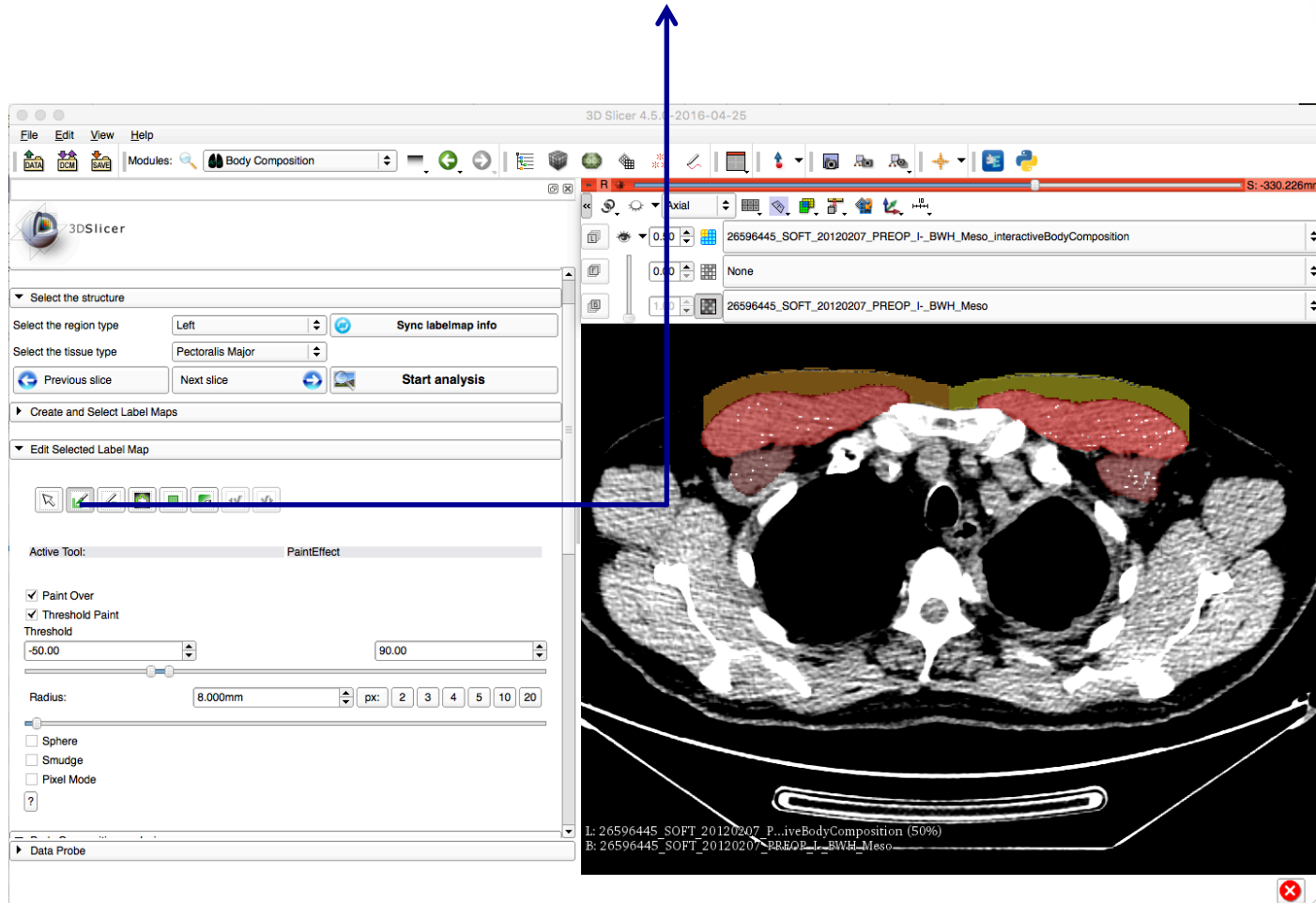
Tip: Window contrast level will be automatically adjusted for a better visualization of the structure



Body Composition

4- Draw the specific structure using the optimized Slicer Editor.

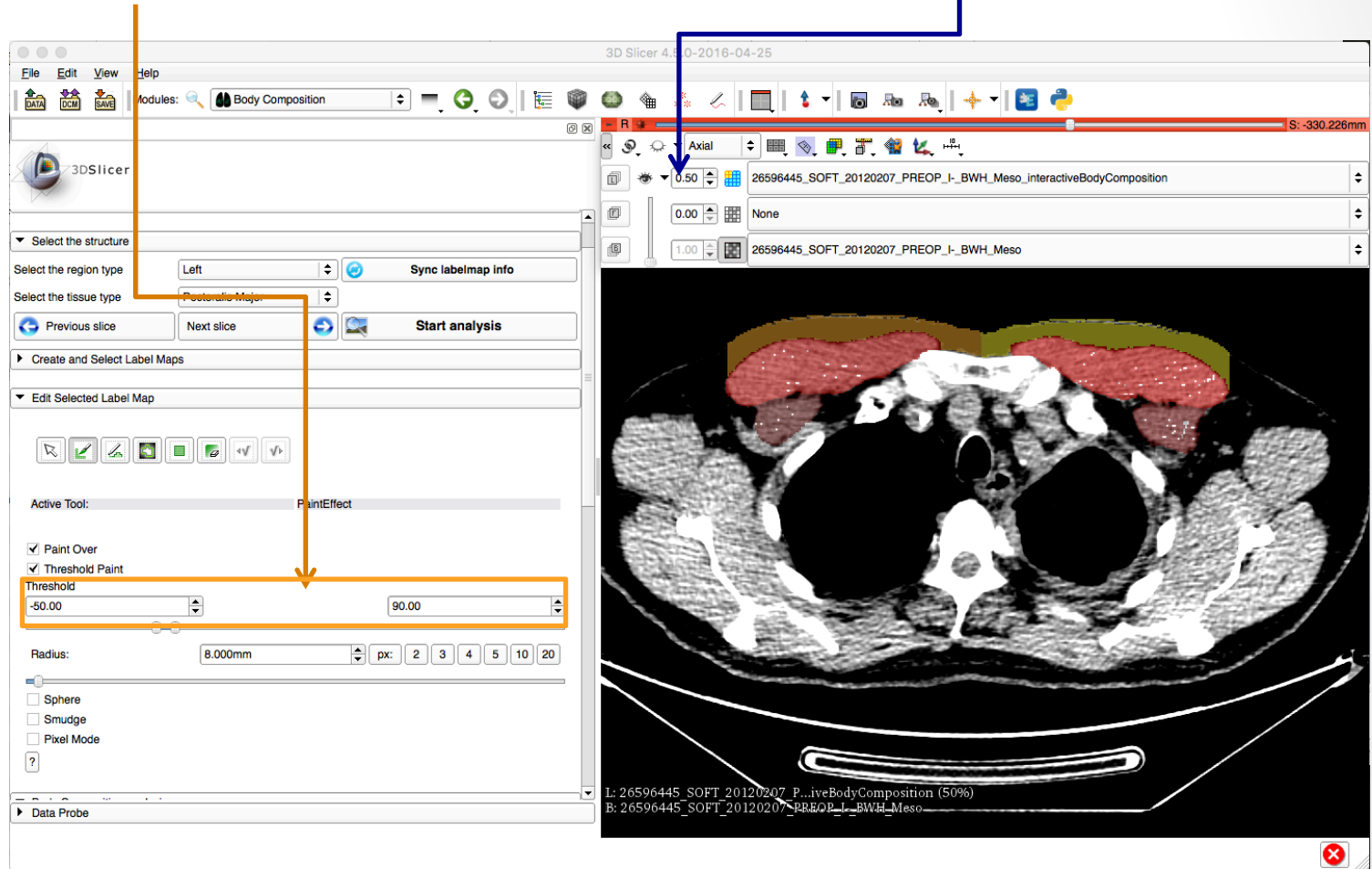
Tip: when the structure is selected, the recommended tool will be selected too, but it could be changed as desired.



Body Composition

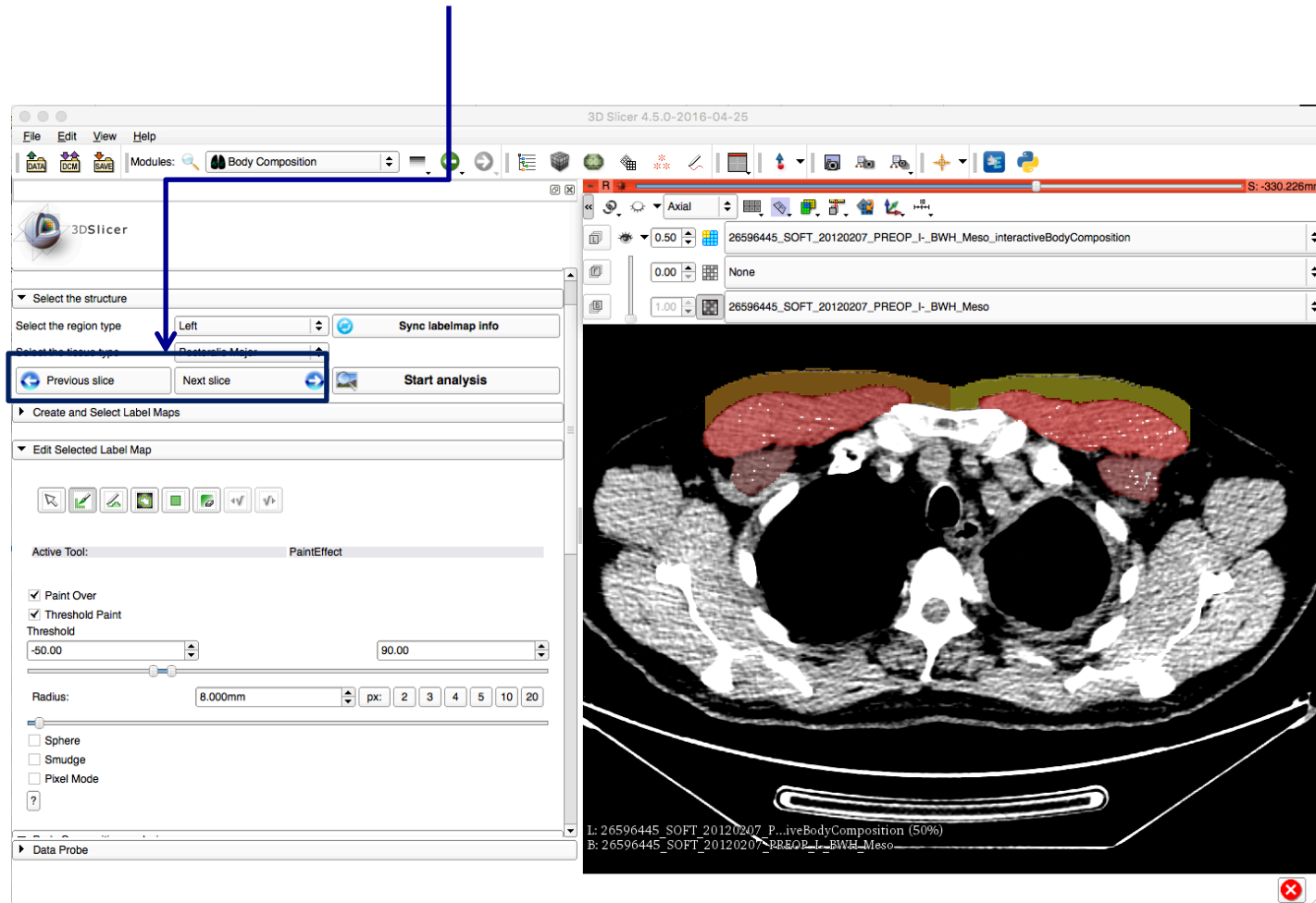
Tip: the labelmap opacity could be adjusted if desired.

Tip: Adjust the threshold level where the structure is constrained if desired.



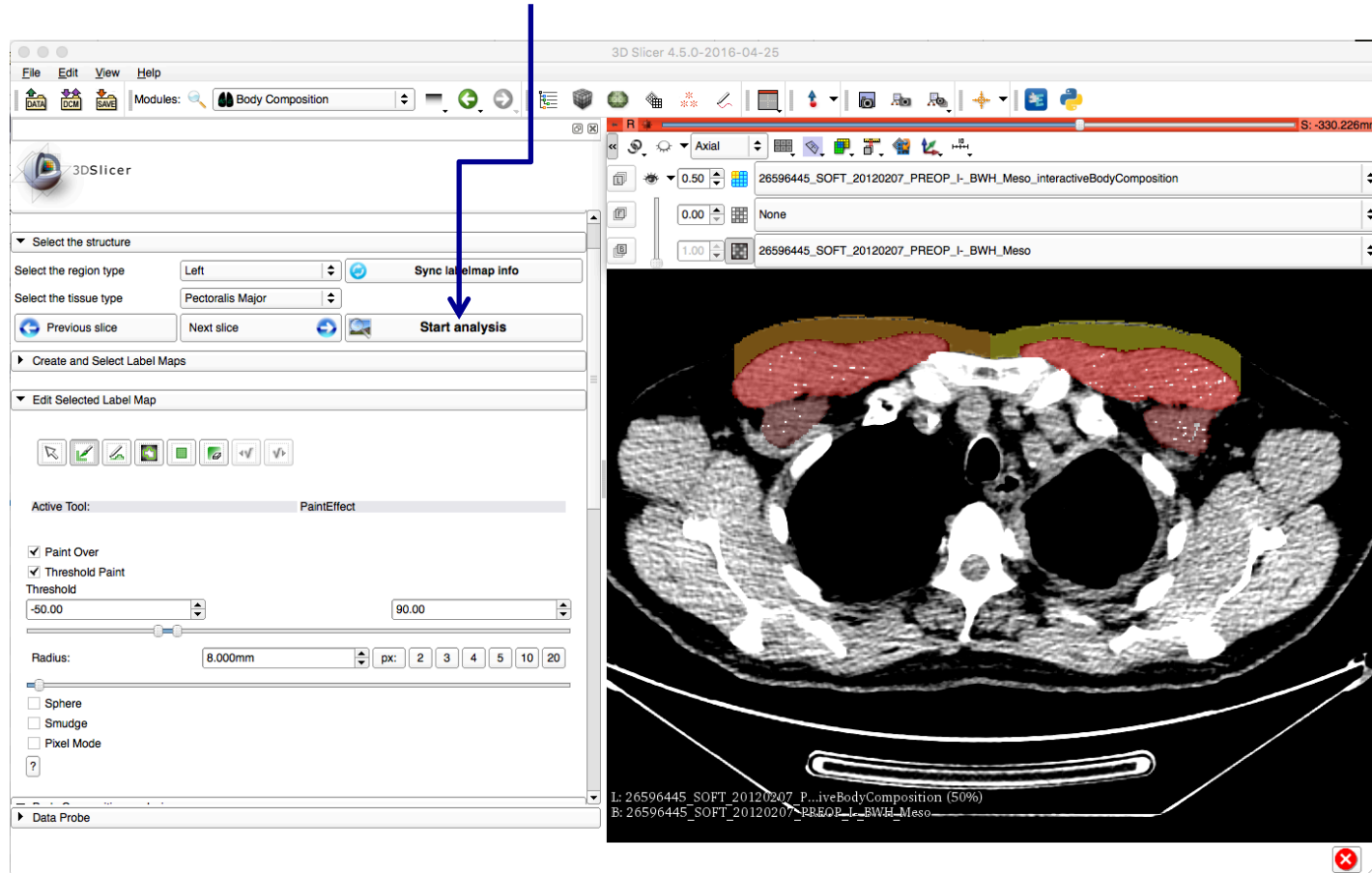
Body Composition

Tip: Use “Previous slice” and “Next slice” buttons to navigate through the different labeled structures



Body Composition

5- Click the “Start analysis” button to run the statistical analysis for every labeled structure



Body Composition

6- Export to a .csv file the results of this individual case

If desired, save the results of the analysis for a later study

3D Slicer 4.5.0-2016-04-25

Body Composition analysis

Start analysis Save Open Export Clear results

Label	Count	Area (mm2)	Min	Max	Mean	Std.Dev.	Median	# Slices
Abdomen-Visceral fat	0	0	0	0	0	0	0	0
Paravertebral-Muscle	0	0	0	0	0	0	0	0
Paravertebral-Muscle (non lean)	0	0	0	0	0	0	0	0
Right-Subcutaneous fat	1619	1544	-197	0	-96.9061	33.9817	-104	1
Left-Pectoralis Major	2561	2442.36	-50	90	43.7872	23.8968	47	1
Left-Pectoralis Major (non lean)	2606	2485.27	-57	116	44.447	24.7609	48	1
Paravertebral-Subcutaneous fat	0	0	0	0	0	0	0	0
Left-Pectoralis Minor	739	704.765	-50	90	38.6373	29.0749	45	1
Left-Pectoralis Minor (non lean)	773	737.189	-83	109	38.8862	31.1824	46	1
Right-Pectoralis Major	2718	2592.08	-50	90	41.9268	24.5241	46	1
Right-Pectoralis Major (non lean)	2744	2616.88	-74	105	42.1545	25.1245	46	1
Right-Pectoralis Minor	672	640.868	-50	90	43.8452	25.9804	48	1
Right-Pectoralis Minor (non lean)	683	651.359	-63	101	43.6149	27.3909	48	1
Left-Subcutaneous fat	1629	1553.53	-200	0	-94.9748	31.8394	-101	1
Left-Subcutaneous fat (non lean)	1693	1614.57	-353	54	-91.124	38.7267	-100	1
Liver	0	0	0	0	0	0	0	0
Spleen	0	0	0	0	0	0	0	0

Export to CSV file

Data Probe

L: 26596445_SOFT_20120207_PRE...riveBodyComposition (50%)
B: 26596445_SOFT_20120207_PRE...t-BWH-Meso

Body Composition

The Body Composition module keeps a table of every case whose analysis has been saved.

Tip: Click “Clean” to eliminate the data.

Data stored in the module:

Timestamp	date	caselid	regionType	label	count	area	min	max
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	18203	Abdomen-Visceral fat	0	0	0	0
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	20508	Paravertebral-Muscle	0	0	0	0
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	20508	Paravertebral-Muscle (non le...	0	0	0	0
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	17944	Right-Subcutaneous ...	0	0	0	0
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	13591	Left-Pectoralis Major	34994	20304.072311...	-50	90
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	13591	Left-Pectoralis Major (non lean)	37530	21775.499623...	-145	529
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	17948	Paravertebral-Subcutaneous ...	0	0	0	0
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	13335	Left-Pectoralis Minor	0	0	0	0
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	13335	Left-Pectoralis Minor (non lean)	0	0	0	0
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	13592	Right-Pectoralis Major	0	0	0	0
2016/05/27 16:10:13	2016/05/27 16:10:13	CT-chest	13592	Right-Pectoralis	0	0	0	0

Buttons: Export, Clean

Body Composition analysis: Start analysis, Save, Open, Export, Clean cache

Data Probe: Show Zoomed Slice

Labels: L, F, B

Case ID: 10015T_INSP_STD_BWH_COPD_i...tiveBodyComposition (100%)

Case ID: 10015T_INSP_STD_BWH_COPD

Body Composition

- The Body Composition module is part of the Chest Imaging Platform extension for 3D Slicer (www.chestimagingplatform.org)
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