Introduction to the Cardiovascular System

Control Area

Cross Section Area

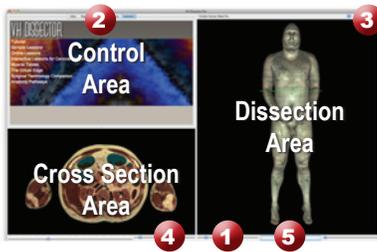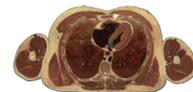**Dissection Area**

Learning Objective
After completing this exercise, you will be able to name major organs of the cardiovascular system and some of the major arteries and veins

Use the reference on the left to locate controls and areas referred to in the text below.

1 Start by setting the cross section through the area we want to explore:

- Drag the reference plane in the dissection area by its green border to the level of the nipples
  (*the cross sections are numbered in the lower left corner, you should be at 1450*)
- Explore the anatomy of the thorax by moving your mouse over the cross section
  (*structures are identified in the upper left corner of the cross section area*)
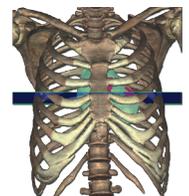
2 Visualize the heart:

- Click the "Clear" button to clear the dissection area
- Select the "Systems" tab ②
- Select "Skeletal system" from the list and click the "Add" button at the bottom of the control area
- Expand "Cardiovascular system" using the icon to the left of it
- Select "Heart" and click "Add & Highlight"

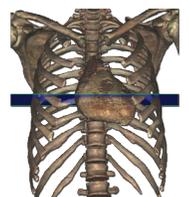> *Add, remove and highlight groups of structures with the Systems, Regions and Tissues tabs*

3 Take a closer look by magnifying the heart in the dissection area:

- Zoom in using the magnification slider ①
- Drag the dissection with your mouse to reposition it, centering the heart in the dissection view

4 Reveal the heart:

- Click on the body of the sternum in the dissection area to highlight it
  (*structures change color when highlighted*)
- Click on the highlighted sternum again to dissect it
  (*now you see the portion of the heart deep to the sternum*)
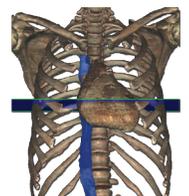- Dissect the manubrium of the sternum, xiphoid process and right and left costal cartilage

> *Click on a structure to highlight, Click again to dissect*

5 Identify the major vessels entering and leaving the heart:

- Select the "Index" tab ②
- Enter "vena cava" into the search box
- Select the "Superior vena cava" from the list
- Click the "Add & Highlight" button
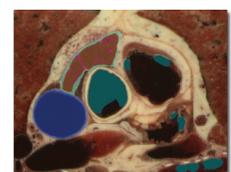- Add and highlight the inferior vena cava as well

> *Locate specific structures with the Index tab*

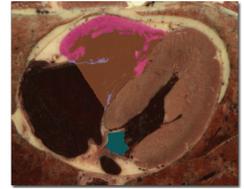**Which chamber of the heart does venous blood from the superior and inferior vena cava enter?**

(*hint: examine cross section 1400, through the superior heart*)

1. _____

6 **Examine the chambers of the heart:**
- Click the "Clear" button to clear the dissection area **3**
- Set the cross section to 1450
- Select the "Systems" tab, expand "Cardiovascular system", then expand "Heart"
- Select "Right Atrium" and click "Add & Highlight"
- Zoom in on the heart in the cross section using the magnification slider **4**, drag the cross section to reposition it if necessary
- Examine the structures of the right atrium
- Using the "Systems" tab, remove the right atrium and add & highlight the right ventricle

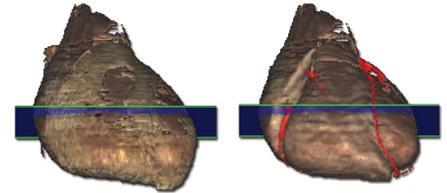**Which structure separates the right ventricle from the right atrium?**

(Hint: this structure prevents blood from flowing backward)

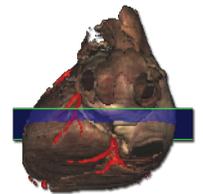1. _____

7 **Isolate the arteries that feed the heart:**
- Click the "Clear" button to clear the dissection area
- Select the "Systems" tab, expand "Cardiovascular system"
- Select "Heart" and click "Add"
- In the dissection, locate and dissect the epicardium and the subepicardial fat
- Again in the "Systems" tab, expand "Arteries" under "Cardiovascular system"
- Expand "Aorta" and then expand "Ascending aorta"
- Add and highlight the left and right coronary arteries

8 **Examine the coronary arteries by rotating the dissection:**
- Rotate the dissection to 180°, examining the coronary arteries, using the rotation wheel **5** or by pressing the left or right arrow keys while holding the command (Mac) or ctrl (PC) key to rotate one increment at a time (45° Lite version, 5° Pro version)

> ***Rotate the dissection using the left or right arrow keys while holding the command (Mac) or ctrl (PC) key***
> ***Alternately, use the rotation wheel below the dissection area***
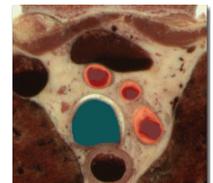
9 **Visualize the aortic arch:**
- Click the "Clear" button to clear the dissection area
- Again, add the heart using the "Systems" tab
- Using the Index, add and highlight the aortic arch
- Rotate the dissection to 315°
- Move the cross section to 1350, just superior to the heart

> ***Move through the cross sections one at a time by holding the command (Mac) or ctrl (PC) key while pressing the up or down arrow keys***

- In the cross section area, zoom in on the area between the lungs
- Locate the three branches of the aortic arch in the cross section
- Hold down the shift key and click on each of these arteries to add and highlight them in the dissection

> ***Highlight multiple structures or de-highlight a single structure by holding the shift key when clicking***

Name the three branches of the aortic arch:

1. _____   2. _____

3. _____