

# LABORATORY EXERCISE 41

## STRUCTURE OF THE HEART

### Instructional Suggestions

1. You may want to have the students use colored pencils to color the features of the heart and blood vessels in figure 41.3. This activity should help them observe the illustrations more carefully and locate the various features shown from different views in the figures. They can check their work by referring to the corresponding figures in the textbook, which are presented in full color.
2. Instead of using preserved sheep hearts, you might want to provide fresh pig hearts for dissection.
3. To reduce the cost of specimens used, you might provide predissected, preserved sheep hearts for observation and save the specimens for use with other classes.
4. Fresh beef hearts are sometimes available from meat-packing houses. You might want to demonstrate the dissection of this large heart. Try to make sure that the atria and large blood vessels are left attached for this purpose.

### Figure Labels

#### FIG. 41.1

- |                          |                         |
|--------------------------|-------------------------|
| 1. Aorta                 | 7. Pulmonary trunk      |
| 2. Superior vena cava    | 8. Left atrium          |
| 3. Right atrium          | 9. Left coronary artery |
| 4. Right coronary artery | 10. Great cardiac vein  |
| 5. Right ventricle       | 11. Left ventricle      |
| 6. Inferior vena cava    |                         |

#### FIG. 41.2

- |                          |                       |
|--------------------------|-----------------------|
| 1. Aorta                 | 6. Apex of the heart  |
| 2. Left pulmonary artery | 7. Superior vena cava |
| 3. Left pulmonary veins  | 8. Right atrium       |
| 4. Left atrium           | 9. Inferior vena cava |
| 5. Left ventricle        | 10. Right ventricle   |

#### FIG. 41.3

- |                              |                             |
|------------------------------|-----------------------------|
| 1. Aorta                     | 10. Pulmonary trunk         |
| 2. Superior vena cava        | 11. Left pulmonary veins    |
| 3. Aortic valve              | 12. Left atrium             |
| 4. Right atrium              | 13. Pulmonary valve         |
| 5. Opening of coronary sinus | 14. Mitral (bicuspid) valve |
| 6. Tricuspid valve           | 15. Papillary muscle        |
| 7. Chordae tendineae         | 16. Interventricular septum |
| 8. Inferior vena cava        | 17. Left ventricle          |
| 9. Left pulmonary artery     | 18. Right ventricle         |

## **Laboratory Report Answers**

### **PART A**

- |    |   |     |   |
|----|---|-----|---|
| 1. | c | 9.  | g |
| 2. | k | 10. | j |
| 3. | o | 11. | l |
| 4. | m | 12. | d |
| 5. | h | 13. | e |
| 6. | i | 14. | a |
| 7. | n | 15. | b |
| 8. | f |     |   |

### **PART B (figure 41.6)**

- |    |                    |    |                         |     |                         |
|----|--------------------|----|-------------------------|-----|-------------------------|
| 1. | Superior vena cava | 5. | Tricuspid valve         | 9.  | Mitral (bicuspid) valve |
| 2. | Aorta              | 6. | Right ventricle         | 10. | Left ventricle          |
| 3. | Right atrium       | 7. | Interventricular septum | 11. | Apex                    |
| 4. | Aortic valve       | 8. | Left atrium             |     |                         |

### **PART C**

- |    |   |    |   |
|----|---|----|---|
| 1. | The tricuspid valve is composed of three relatively large cusps that contain chordae tendineae; the pulmonary valve is made up of three smaller pocketlike cusps that lack chordae tendineae. | 4. | The thicker wall of the aorta allows it to withstand the higher pressure of the blood pumped out from the left ventricle. The thinner wall of the pulmonary trunk (artery) is related to the lower pressure of the blood that leaves the right ventricle. |
| 2. | The cusps of the tricuspid valve move upward into a horizontal position and close the opening between the right atrium and the right ventricle.   | 5. | Vena cava, right atrium, tricuspid valve, right ventricle, pulmonary valve, pulmonary trunk, pulmonary artery, capillary of lungs, pulmonary vein, left atrium, mitral (bicuspid) valve, left ventricle, aortic valve, aorta                              |
| 3. | The chordae tendineae and papillary muscles prevent the cusps of the tricuspid and mitral (bicuspid) valves from swinging into the atria when the ventricles contract.                        |    |   |



### **Critical Thinking Application Answer**

The thicker wall of the left ventricle allows it to contract with greater force and create the high pressure needed to move blood to all parts of the body (systemic circuit) except the lungs. The thinner wall of the right ventricle creates the lower pressure needed to move blood a relatively short distance to the lungs (pulmonary circuit).