# LAB PART 4- THE FETAL PIG - RESPIRATORY SYSTEM

**Procedure 46** In order to expose some of the important organs of the respiratory system, you will need to make several more major cuts. Please follow directions and obtain help from your teacher when instructed to do so.

**Procedure 47** If you have not already done so, extend the ventral incision toward the head all the way to the chin. By carefully cutting downward through the tissue and periodically feeling for the larynx (a hard lump) or the Adam's apple, you will see a small dark roundish mass - the thyroid gland. If you have been careful you have not cut it in two. SHOW this gland to your teacher.

*Observation 27* Explain how you can recognize the thyroid gland (how does it stand out from the surrounding tissue)?

**Procedure 48** Before examining the respiratory system in greater detail, you will need to make an incision to expose the salivary glands found in the throat region. Carefully remove tissue in the throat region under the jaw to expose these glands. Verify that you have done so with your teacher.

*Observation 28* Do you see only a single gland or a series of salivary glands?

**Procedure 49** Now, carefully continue to cut tissue away from the lateral and ventral surfaces of the larynx so that it is completely exposed (all the tissue is cleaned away) on three of its sides.

**Procedure 50** Now move the larynx and thyroid to your left and coming out the posterior part of the larynx you will find a tube callled the trachea. This is the windpipe and it is part of the respiratory system. If you can not postively identify the trachae, check with your teacher.

*Observation 29* Explain how you would describe the appearance of the trachea.

**Procedure 51** Carefully clean away the excess tissue around the trachea. You should be able to see that it is supported by cartilaginous rings which appear as whitish horizontal lines across the trachea.

*Observation 30* Were you able to distinctly see the cartilaginous rings?

**Procedure 52** Carefully push the trachea to one side and you should find lying directly beneath (dorsal) the trachea a collapsed tube - this is the esophagus. In life, the esophagus is pushed open by the food that is being swallowed. Show to your teacher the esophagus.

*Observation 31* How do you know that this collapsed tube is not a blood vessel?

**Procedure 53** At the back of the mouth cavity is a little flap - the epiglottis. WITH HELP FROM YOUR TEACHER AND WITH SPECIAL INSTRUCTIONS, 2 CUTS CAN BE MADE THAT WILL EXPOSE THE EPIGLOTTIS AND THE VERY CLOSE RELATIONSHIP BETWEEN THE TRACHEA AND ESOPHAGUS. This is to be done AFTER you receive instructions from your teacher.

*Observation 32* Describe what the epiglottis looks like.

*Observation 33* At what point does the trachea and esophagus become two distinct tubes?

PIG LAB PART 4 - INTERNAL EXAMINATION CONT. -RESPIRATORY SYSTEM

**Procedure 54** On the piece that you have now removed from the FETAL pig, follow the trachea posteriorly as it leads into the lungs (you should only have the right lung left in the pig). You will find that it branches into two bronchi that lead to the lungs. The bronchi branch again to form the bronchioles which eventually lead to the tiny air sacs or alveoli. The alveoli in healthy lungs give the lungs a bubbly appearance.

*Observation 34* Which of these structures were you able to identify?

*Observation 35* Were you able to see the alveoli - the tiny air sacs?

**Procedure 55** Remove a small piece of lung tissue and drop it into a beaker of water.

*Observation 36* What happened when the lung tissue was dropped into the beaker of water? (Did it float or sink??)

**Procedure 56** You may now dispose of any loose tissue that you have and you can put the pig back into the Pail.

**Procedure 57*** Doc will set up for you at the end of class several slides showing a normal healthy human lung and a smokers lung. Examine and make a drawing of the normal healthy human lung and the smokers lung.

*Observation 37* Compare the 2 (two) sections of lung tissue.

*Observation 38* What damage do you think a smoker has done to their lung tissue??

**Procedure 58** Answers the following questions in your lab under Questions

Questions:

31. What is the common name for the trachea?
32. What is the function of the cartilaginous rings in the trachea?
33. What is the function of the epiglottis?
34. What is the function of the alveoli and explain what healthy alveoli would look like.
35. How many cells thick are the alveoli? (Think)
36. How many alveoli are estimated to be present in human lungs? (See Doc)
37. What is the function of the mucus secreted by the lining of the trachae, bronchi and bronchioles
38. When you dropped your lung tissue into a beaker of water, EXPLAIN WHY this particular event took place. **(Think)**

***FOR ANSWERS TO THE FOLLOWING QUESTIONS PLEASE CONSULT THE HANDOUT SHEET***

39. Explain what causes emphysema.
40. What are 2 factors that can bring on emphysema? (See Doc)
41. What is the best known result of heavy smoking?
42. Cigarette smoking is also a factor in what two other serious diseases?
43. What are some other body parts that may be harmed by smoking?
44. How does smoke from other cigarettes affect a nonsmoker?

## 44-1 The Effects of Smoking

Cigarette smoke consists of gases and tiny particles. These substances harm the cilia and mucous membranes that line the breathing passages. Many smokers cough frequently. The cough is the body's effort to clear the breathing passages. Healthy cilia and mucous membranes accomplish the cleaning process automatically.

Smoke also damages the lungs. Long-term smoking can cause the walls of the alveoli to rupture, or break. As a result, the surface area for gas exchange decreases considerably, as shown in Figure 44.1. This condition, called **emphysema** [ehm-fuh-ZEE-muh], interferes with oxygen intake. Death may eventually result.

The best known result of heavy smoking is lung cancer. Chemicals in the smoke cause changes within the cells of the lungs. These changes may lead to cancer. Death from lung cancer is about ten times more frequent for smokers than for nonsmokers.

In the lungs, nicotine passes into the bloodstream. In the blood, nicotine travels to all parts of the body. Nicotine causes the blood vessels to constrict, or become narrow. When blood has to move through narrower vessels, blood pressure goes up. This puts the smoker at high risk for such problems as strokes and heart attacks. Cigarette smoking is also a factor in coronary-artery disease and arteriosclerosis.

The respiratory and circulatory systems are not the only parts of the body harmed by smoking. Cigarette smoking has been associated with ulcers in the digestive tract. Cancers of the larynx, mouth, esophagus, bladder, and pancreas have also been linked to smoking.

## 44-2 Factors Affecting Smoking Risks

Several factors influence the effects of smoking. The more cigarettes a person smokes, the higher the risk of tobacco-related disease. The longer a person has smoked, the greater the risk. Cigarette brands high in tars are somewhat more harmful than low-tar cigarettes. (Tars are certain irritating materials found in tobacco smoke.)

Research indicates that smoke from other people's cigarettes affects nonsmokers. A nonsmoker who spends the working day in a smoke-filled room suffers health risks. These risks are similar to those of a person who smokes about ten cigarettes a day. This discovery has stimulated a campaign by non-smokers to limit smoking in public places.

The damage caused by cigarette smoking is not always permanent. If a person stops smoking, the lungs may return to a healthier, more normal condition. However, recovery may take a long time.