

## Student Handout

### Overview of the Experiments

#### FRANCESCO REDI'S EXPERIMENTS

Redi was attempting to dispute spontaneous generation and the belief that maggots arose spontaneously from decaying meat.

- In his first experiment, Redi placed meat into two different jars. In one jar, the meat was left exposed to the air, while the other jar was sealed with wax. Maggots appeared only in the uncovered jar.
- Redi conducted a second experiment to address the criticism that the lack of fresh air in the wax covered jar would prevent any maggots from growing. Again, one jar was left exposed to the air. The other jar was covered with a layer of gauze so that air could enter the jar. Maggots appeared only in the uncovered jar.

Redi concluded that maggots were only present on meat when a fly was able to land on its surface and lay eggs. Maggots did not appear on the meat in the covered jars because the flies were unable to land on the surface of the meat and lay their eggs. Conclusion: life comes from other life. For reference, a house fly can lay 75-100 eggs at one time. These eggs hatch within a day.

#### LOUIS PASTEUR'S EXPERIMENTS

Pasteur conducted a series of experiments to dispute the idea that bacteria spontaneously arose from organic matter (nutrient broth).

- Using a regular flask filled with sterile broth that was open to the air, Pasteur found that microorganisms appeared in the flask.
- Using a regular sealed flask with sterilized broth, Pasteur found no microorganisms appeared.
- Pasteur used a swan-neck flask filled with nutrient broth. He boiled the flask to sterilize the broth and left it open to the air. No microorganisms grew.
- Using a regular open flask containing sterile broth, Pasteur used a flame to sterilize the air entering the flask. No microorganisms grew.

Pasteur concluded that microorganisms are present in the air and will grow if they have a supply of nutrients. Microorganisms didn't appear in the sealed flask because the air and any microorganisms it may have contained were unable to reach the nutrient broth. They also didn't appear in the swan-neck flask because the curvature of the flask prevented them from reaching the nutrient broth. Alternatively, by heating the air as it entered the flask, the microorganisms were killed. The only flask that microorganisms appeared in was the one that was open to the air and allowed airborne microorganisms to reach the nutrient broth. Conclusion: life comes from other life.