

Disinfecting Skin with Alcohol

Background: Microbes live on our skin as part of our normal flora. That means that they are always there and generally do us no harm. In fact, normal flora act as a defense mechanism by preventing harmful microbes from establishing themselves in or on the human body. However, sometimes it is important to remove as many microbes from our skin as possible. For example, before you have a shot at the doctor's office, a disinfectant will be used to remove microbes on your skin. Then there is less danger that they will get under the skin where they might cause an infection.

Alcohol is one of the most commonly used disinfectants. It kills most bacteria and fungi by acting on lipid and protein components of the cell. Alcohol is inexpensive and non-toxic, so it is very useful for many applications, especially as a disinfectant for skin.

Materials (per student)

- Nutrient agar plate
- Sterile alcohol wipe (in foil package)
- Marking pen (one per 4-5 students)

Procedure

1. Obtain a plate of nutrient agar and a sterile alcohol wipe.
2. Use a marking pen to divide the plate into 4 quadrants, by making intersecting lines on the bottom of the plate. Label the quadrants 1, 2, 3, 4.
3. Turn the plate right side up. Note that when you turn the plate right side up, the right and left sides of the plate will be reversed so check the numbers carefully.
4. Open the plate and gently place the pad of your right forefinger on the agar in the center of quadrant 1. Remove after about 2 seconds.
5. Immediately place the pad of the same finger on the agar in the center of quadrant 2. . Remove after about 2 seconds.
6. Now place the pad of your left forefinger on the agar in the center of quadrant 3. Remove after about 2 seconds.
7. Place the lid on the plate.
8. Remove the alcohol wipe from the package and gently scrub the pad of your left forefinger with the swab for about 10 seconds.
9. Open the plate and gently place the pad of your left forefinger on the agar in the center of quadrant 4. Remove after about 2 seconds.
10. Place the lid on the plate.
11. Incubate the plate at 37°C (or at room temperature if there is no incubator).

Results

Observe the plate after 1 day and after 2 days of incubation. Do not incubate too long. If you incubate too long the bacteria and fungi will grow too much making it difficult to compare growth. Compare the number of colonies (small circular areas of bacterial or fungal growth) on each of the 4 quadrants. Describe and diagram the areas of growth for all 4 quadrants.

Teacher Preparation

In advance

Prepare or purchase nutrient agar plates and alcohol wipes.

Variations:

You may try scrubbing the forefinger with soap and water, or rubbing it with dry, alcohol-based hand cleaners that comes in a dispenser bottle. You can also try dipping your finger in a beaker of 70% alcohol to see how the results compare with those of the alcohol wipe.

Contributed by

Teresa Thiel

Department of Biology

University of Missouri-St. Louis