



Try This at Home Science: Bacteria Growth Plates

Activity Overview:

Learn about the diversity of bacteria that live with you at home and within you!

Materials:

- Petri dishes or several condiment cups with lids
- 1 teaspoon of beef stock powder or beef bullion
- 1 cup water
- 1 teaspoon sugar
- 1 teaspoon of Agar powder or gelatin
- Spoon
- Two sealable plastic bags
- Clear tape
- Permanent marker or felt-tip pen
- 2 cotton swabs
- Medium sized cardboard box
- A helpful adult

Try this!

Note: Sanitation is very important in this experiment! Though you won't reach completely sterile conditions while experimenting at home; it's important to wash your hands, the counter, and any materials you'll be using thoroughly! This will help prevent germs from entering your petri dish and contaminating your experiment.

Prepare agar plates:

1. After washing and drying the petri dishes or condiment cups, cover them with the lids.
2. With the help of your adult, add the cup of water to a pot, and bring it to a boil on the stovetop.
3. Add the beef stock powder, sugar, and gelatin to the boiling water. Stir until dissolved.
4. Take the mixture off the heat and allow it to cool for ten minutes.
5. Remove the lid from the petri dish, and with the help of your adult, fill each petri dish halfway with the mixture. Quickly set the lid atop each petri dish, leaving space for moisture to escape as the mixture cools.
6. Refrigerate the covered petri dishes for at least four hours, to allow the agar to set.
7. Keep plates refrigerated until ready to use.

Collect bacteria samples:

1. Wipe the screen of a cell phone or tablet with a clean cotton swab.
2. Open one petri dish, and lightly rub your sample across the agar in a zig zag pattern. Dispose of the cotton swab after use.
3. Replace the lid on the petri dish, and tape it closed.

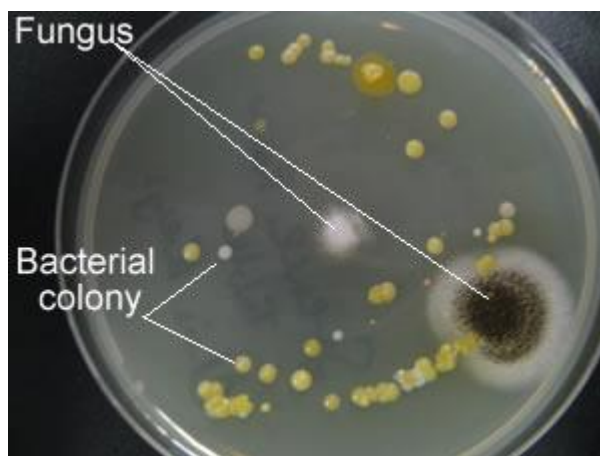
4. Use the tape and marker to label the dish with the date and the name of the sample. Place the plate in a sealed plastic bag and set aside.
5. Clean the surface of the cell phone or tablet, and use a new, clean cotton swab to wipe the surface again.
6. Repeat steps 1-4 in your second petri dish.

Incubate the bacteria colonies:

1. Place your petri dishes upside down inside the cardboard box and close the lid.
2. Set up your incubator by placing the cardboard box under a light source, or near a warm spot, such as behind the refrigerator or on top of a cable box.
3. Leave the plate to incubate for 2-5 days.
4. Remove the petri dish from the box and observe!
5. **DO NOT** open the sealed petri dish or plastic bag. To dispose of your growth plates, put entire bag containing the dish in the trash.

What's happening?

Bacteria, unlike plant and animal cells, are one-celled microorganisms. This means they are tiny cells that lack a membrane, with DNA floating around inside the cell. Bacteria reproduce through a process called binary fission, where one cell splits into two, which allows a culture to grow very large, very quickly. Like plant and animal cells, bacteria need nutrients in order to grow. In this experiment, the beef-sugar-gelatin agar mixture we made provides nutrients and a controlled environment to allow bacteria to grow into multiple colonies.



Why are bacteria so important?

Bacteria are everywhere! We can find good bacteria in our large intestine, breaking down our lunch or working hard at an oil spill clean-up, 'eating' the toxins and turning them into less harmful substances. While bacteria can be helpful, there are types of bacteria called pathogens that can cause sickness and disease. You can find bacteria in the plaque buildup on our teeth and inside the lungs of a person who has pneumonia. Though bacterial infections are common, many of them can be avoided by practicing good hygiene to kill bacteria or stop them from reproducing. This includes disinfecting commonly used surfaces (such as a cell phone), cooking your food to the correct temperature, and taking necessary antibiotics to stop the spread of an infection. All in all, bacteria are amazing, dangerous creatures that are vital to our world and fascinating to study!

Now try...

- Use a clean cotton swab to collect a sample from inside your mouth. Incubate for 2-5 days. How does it compare to the bacteria you found on your phone?
- Repeat this experiment, adding a drop of sanitizer to the middle of the dish after you've wiped your sample on the agar. Did the bacteria grow in the area with the sanitizer?
- Collect an air sample by leaving the petri dish open outside for a few minutes. Do these bacteria colonies look different from the ones you previously collected?

Types of Bacteria



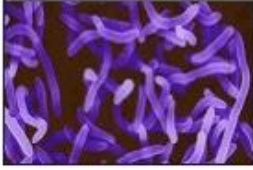


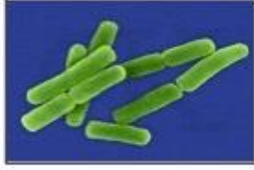





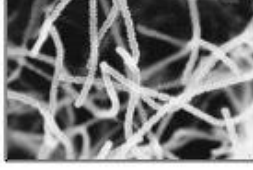
Circular	Rod-shaped	Curved Forms	Other Shapes
 Diplo- (in pairs)	 Coccobacilli (oval)	 Vibrio (curved rod)	 Helicobacter (helical)
 Strepto- (in chains)	 Streptobacilli	 Spirilla (coil)	 Corynebacter (club)
 Staphylo- (clusters)	 Mycobacteria	 Spirochete (spiral)	 Streptomyces

Image: BioNinja