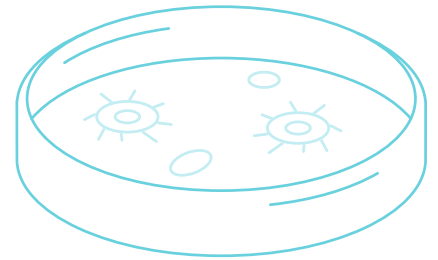


Exploring Germs and Bacteria at Home (DIY Agar Petri Dishes) Experiment



Navigate to:

Meet Renee Iacona, MPH, PhD

Vice President of Oncology Biometrics,
Oncology R&D, AstraZeneca

What do you do at AstraZeneca?

I analyze data (statistics) to ensure our drugs work and are safe.

What was your favorite class growing up?

Biology!

Was there a moment in your elementary school years that sparked your passion for science?

Dissecting a planaria worm and watching it regenerate.

Why do you love science?

I can ask a question and discover the answer through my work.

What advice would you give your 13-year-old self?

Be curious! Explore what you think is cool.

How did you navigate the challenges of being a woman in STEM?

I never thought about being a woman in STEM. I was just Renee in STEM.

Why should students consider a career in STEM?

Whatever you're passionate about, STEM or something else, use your passion to make a difference in the lives of others.

What scientist inspires you? Why?

Mary-Claire King, she figured out why individual families have higher rates of breast cancer through genetics.

Materials



- Safety goggles or clear-lensed glasses
- A lab coat or kitchen apron
- Latex or non-latex gloves
- Cotton Swabs
- Washi paper tape or masking tape
- A permanent marker
- A ruler
- A notebook
- A pen
- A camera or smartphone camera (optional)
- Homemade Agar Petri Dishes or Ramekins
 - 25 grams (12.5 teaspoons) of agar powder or flakes (can be found in the Specialty aisle in grocery stores or purchased online)
 - 625 milliliters (2 2/3 cup) of water
 - 5 clean ramekins or sterile empty petri dishes
 - A roll of plastic wrap
 - Clean microwave-safe medium-sized glass bowl
 - Clean spoon or fork
- Pre-Made Agar Petri Dishes
 - 5 sterile pre-made agar petri dishes (can be purchased online)

Read the Directions

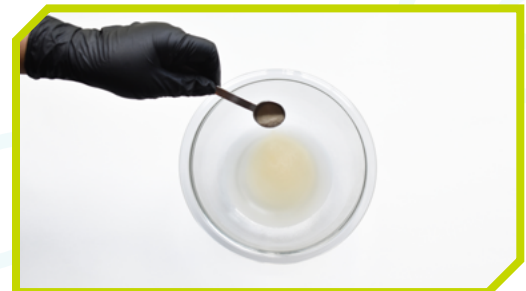
Before starting your experiment, carefully read the protocol before starting. If helpful, record the protocol in your notebook, which will help document your science experiment.

Practice Safety

Before starting, find a clean surface to set-up your experiment. Then, put on your safety goggles, lab coat (or kitchen apron) and gloves. It is always important to practice safety when exploring science!

Experiment Procedure

01. **If you are using sterile, pre-made agar petri dishes**, skip to Step 8. If you are making your own agar petri dishes or ramekins, proceed to Step 2.
02. **Microwave your microwave-safe glass bowl**, ramekins and liquid measuring glass for two minutes to sterilize. This is known as autoclaving!
03. **To make your own agar petri dishes or ramekins**, pour 625ml of water into a clean microwave-safe medium-sized glass bowl. Add 25g of agar into the same bowl, stir until completely dissolved with a clean spoon or fork.
04. **Put the agar-water solution into the microwave** and set the timer for 4 minutes. Keep a close eye on the solution to make sure it does not boil over the bowl.
05. **Let the solution cool for 1 minute before removing** from the microwave. Be careful, the glass and agar-water solution will be hot!



06. Pour the solution into your five empty petri dishes or ramekins and cover with the plastic lid or plastic wrap.



07. After one hour, the solution will solidify. You should now have 5 agar-filled petri dishes or ramekins.

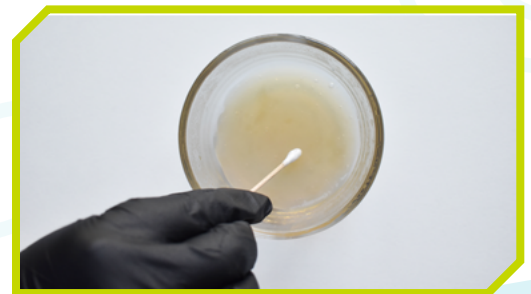
08. Set one of your agar-filled petri dishes or ramekins aside and label it, "Control" using the permanent marker.



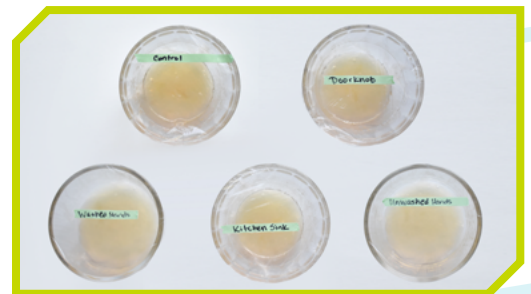
09. For your other four agar-filled petri dishes or ramekins, identify four different surfaces you want to test for bacteria. Use a cotton swab to collect bacteria samples (e.g., door handle, unwashed or clean hands, your mouth before and after brushing your teeth, kitchen sink). Make sure to use one swab per surface.



10. After swabbing a surface, softly draw a squiggly line across the agar and close the lid / recover with plastic wrap. Use one swab per agar plate and make sure to label each agar plate with what was swabbed.

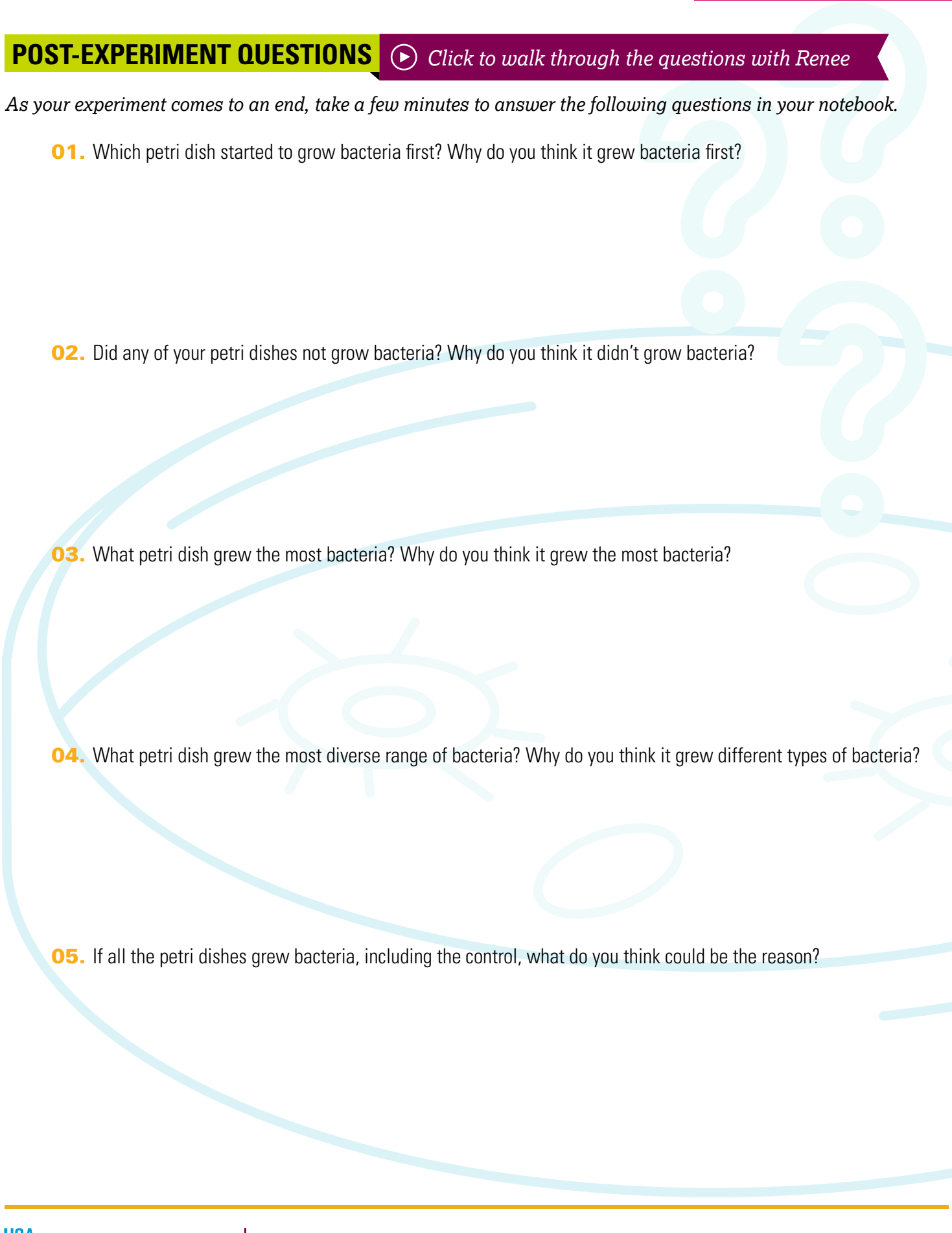


11. For the next week, analyze your petri dishes every day and write down your observations in your notebook. You can also take photos to document "Day 2", "Day 3", "Day 4", etc. If bacteria start to appear on any of the agar plates, take a ruler to measure the bacteria, and record your observations in your notebook (e.g., color(s), size, clusters). You can even draw or snap a picture of the agar plates each day to include with your notebook entries.



POST-EXPERIMENT QUESTIONS Click to walk through the questions with Renee

As your experiment comes to an end, take a few minutes to answer the following questions in your notebook.

01. Which petri dish started to grow bacteria first? Why do you think it grew bacteria first?
 02. Did any of your petri dishes not grow bacteria? Why do you think it didn't grow bacteria?
 03. What petri dish grew the most bacteria? Why do you think it grew the most bacteria?
 04. What petri dish grew the most diverse range of bacteria? Why do you think it grew different types of bacteria?
 05. If all the petri dishes grew bacteria, including the control, what do you think could be the reason?
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06. Did any part of the experiment surprise you?

07. Why do you think there is a “Control” petri dish?

08. What is another experiment you could do using petri dishes? What would be your hypothesis and experiment procedure?

