

A Mock Epidemic

Name : _____ Date : _____

"I have neither given nor received unauthorized aid on this test or assignment."

Purpose

The purpose of this experiment is to show how easily an organism can be spread by hand. You will also be shown one of the methods used by the public health officials to trace an epidemic.

Caution



The organism we're using today is a common aquatic and soil bacterium. It is not particularly dangerous, and rarely infects humans. However, there have been reported cases of infection, ranging from mild skin lesions to fatal septicemia. As with any wild organism, treat it with respect.

Materials

Culture : *Chromobacterium violaceum*

Media : LB, PYD or NA agar plates (6 per student)

Supplies : Disposable gloves

Foam sponges soaked in culture (1) or sterile broth (the rest)

Sterile cotton swabs

Badge labels

Bleach discard beakers and biohazard disposal bag

Procedure

Only one person will have *Chromobacterium*, the rest will have plugs soaked in sterile medium. The person with the *Chromobacterium* culture (known only to your instructor) will be "it". By shaking hands with other members of the class, the person who is "it" will spread the organism. The hands are then swabbed and tested on plates for the presence of *Chromobacterium*. Next week, by working backwards you will determine who started the "epidemic" and trace its progress through the classroom population.

Part 1 - Day 1

1. Write your name on a label and wear it as a badge.
2. Label 6 agar plates with the numbers 0 through 5, followed by your name and a dash. For example, if you are "Jim", label the 5 plates "0Jim-", "1Jim-", "2Jim-", "3Jim-", "4Jim-", and "5Jim-".
3. Choose a glove size you think will fit your hand, and put a single glove on your right hand only.
4. With your gloved right hand only, pick up the sponge in your petri dish, and squeeze it (over the petri dish, please) until your glove is moist. Place the sponge back into the dish. If any culture drips onto the bench or floor, notify the instructor right away so it can be cleaned up with bleach.
5. Using a sterile cotton swab, swab your gloved right hand, then use this swab to swab agar plate "0". This plate will serve as our control to definitively determine who is "it". Of course in the real world, you wouldn't have this opportunity. Discard the swab into a bleach discard beaker.
6. Squeeze your sponge to rewet your gloved hand, and shake gloved hands with someone. Swab your gloved hand with a sterile swab, then use this to swab plate "1". Label this plate after the dash with the name of the person you shook hands with. For example, "1Jim-Tyler" if you're Jim and you shook hands with Tyler. Cover this plate and set it aside, and dispose of the swab in the beach discard beaker.
7. Begin another round by rewetting your gloved hand with your sponge, and shaking hands with a different person (different than the person you shook hands with in the first round). **MAKE SURE THIS PERSON IS ALSO ON ROUND 2.** Swab your gloved hand with a sterile swab, and use this to swab plate "2". Label this plate as before with the name of the person you shook hands with.
8. Carry out a third round of rewetting and shaking hands as before. Shake hands with someone new (make sure they're also on round 3), and after swabbing plate "3", label with the name of this new person.
9. Carry out a fourth round of rewetting and shaking hands as before. Shake hands with someone new (someone on round 4), and after swabbing plate "4", label with the name of this new person.
10. Carry out the 5th and final round of rewetting and handshaking, once again with someone you haven't shaken hands with before and who is in their final round. After swabbing plate "5", label with this person's name.
11. Remove your glove by turning it inside out from the wrist, and dispose of it in the biohazard bag. Thoroughly wipe down the benchtop with ethanol or amphyll, and wash your hands with soap and warm water.
12. Stack all of your plates together "upside down" (with the agar-containing part of the plate up) on the incubation shelf.

Part 2 - Day 2

13. Examine your 5 plates (remember that the instructor has your plate "0"), and mark them either positive or negative for purple colonies.
14. Record your results on the classroom board. Find the column with your name, then fill in each row with the name of the person whose hands you shook for that round, and circle or highlight if it was positive. For example, if you are Jim and you shook hands with Bubba on plate "3", and it was positive for purple colonies, then write "Bubba" in row 3 of your column and circle it.
15. Copy all of the classroom data to your scoring sheet (next page).

Questions

1. Who was “Typhoid Mary”?
2. Can you trace the progression of the “infection” through the class? Show on the scoring sheet how the infection was passed from person to person.
3. Give at two specific ways in which this experiment reflects a genuine epidemic.
4. List two specific ways in which this experiment *exaggerates* a genuine epidemic.
5. List two specific ways in which this experiment *underestimates* a genuine epidemic.
6. Normally in an epidemic we could narrow down the source of the infection to two people. Can you think of some way (method or test) that we could use to help us to identify with whom the infection originated?