

BIO 255 Medical Microbiology

Can Facial Tissue or Toilet Paper Protect your Fingers from Bacteria?

You have a cold and blow your nose using a tissue, or you are using bathroom tissue. Have you contaminated your hands with bacteria? In this exercise you will see if your fingers are protected from bacteria by using facial or toilet tissue. Each group of students will test layers of the selected tissue against either *Staphylococcus epidermidis* or *E. coli*. After spreading a drop of the culture broth on a Tryptic Soy Agar plate, you will see how many layers of tissue can protect your gloved fingers from the bacteria on the agar surface. After incubation comparisons can be made on the overall filtering ability of the various tissues.

MATERIALS (per group of 4)

- 3 Tryptic Soy Agar (TSA) plates
- dilute *S. epidermidis* (*Se*) or *E. coli* (*Ec*) broth cultures, approximately 10^{4-5} cfu/ml
- facial tissue for *Se* or toilet tissue for *Ec*, aseptically cut into strips, in sterile Petri dishes
- sterile swabs
- vinyl gloves

PROCEDURE

- Work in groups of 4 students. Each group will test 1-3 layers of one paper product.
- One TSA plate will be your "Touch" plate. The other two TSA plates will be used to check your fingers for contamination through the tissue layers – label each half of the plates for # of layers of tissues used on the "Touch" plate.

Culture "Touch" plate preparation

Using a swab, cover the surface of the Touch plate with your assigned broth culture (*Se* or *Ec*). Swab back and forth several times to ensure even and complete coverage of the surface.

Control - no tissue

The first person in the group will be the "no tissue" control. Touch 2 gloved fingers directly to the inoculated "Touch" plate surface and then touch those fingers to one half of the agar surface of TSA plate #1.

Test Plates - tissue layers (use appropriate tissue for your assigned culture)

1. Handling all materials as aseptically as possible, the second person will place one layer of the previously cut tissue product on the Touch plate agar surface.
2. Leave one corner of the paper over the edge of the plate to facilitate removal.
3. Firmly press 2 finger tips onto the tissue with your gloved hand, hold for 4-5 seconds or until moisture from the agar surface comes through the tissue layers, then lift off.
4. Using the same pressure touch those finger tips to the other half the agar surface of TSA plate #1 (used for the Control above).
5. Carefully remove the paper from the culture Touch plate. Discard it in the biohazard bag provided.
6. The third and fourth person will repeat this procedure each using new fresh tissue products but adding one additional layer of the same tissue and TSA plate #2.
7. Discard "Touch" plate and tissues. Label the test plates with appropriate information and place inverted in the incubator.
8. Next lab period count and compare the colonies that were transferred by the fingertips and evaluate the effectiveness of the various tissues and layers
9. Obtain results from an adjacent table that used the other tissue and species and record in the table with your results.

Record your results on the next page and submit the sheet for grading when complete.

Name (in pen) _____

Lab day/time _____

RESULTS Tissue effectiveness

Approximate colony counts (express as cfu/fingerprint, if possible; or as relative growth: 0, +, ++, +++):

PRODUCT TESTED	CONTROL	1 LAYER	2 LAYERS	3 LAYERS
1. Toilet paper with <i>E. coli</i>				
2. Facial tissue with <i>S. epidermidis</i>				

1) Explain briefly why the tissue/bacteria combinations were chosen for this exercise. (If your answer exceeds the amount of line space provided you are writing too much.)

2) Would the tissue protect your fingers during actual use? Do more layers provide more protection?

3) If you were to test the tissue used in toilet seat protectors, what species of bacteria would you choose to use on the Touch plate to test the tissue effectiveness? Explain.
