

Microbes in the Air

Air is usually a transport medium rather than a habitat, although most bacteria can become airborne on dust, clothing fibers, sloughed dander from skin, or as aerosol particles from sneezing or coughing. Once airborne, the viability of microbes is reduced by drying and solar ultraviolet radiation. Microbes that resist these hazards, such as spore-formers and pigmented bacteria, are proportionately numerous. Organisms isolated from the air include such genera as *Micrococcus* and *Bacillus*.

Still air loses its microbial burden as particles settle, while wind or activity will stir up greater numbers of organisms. Undisturbed indoor air can become practically bacteria free, but people stir up dust and dander with bacterial hitchhikers. Demonstrate these differences by differential exposures of petri dishes of agar.

Materials required (per group)

8 plates of TSA medium containing 1% cyclohexamide (an antibiotic that blocks protein synthesis in eukaryotic cells)

Procedure

Lab 1

Expose plates of TSA to the air for periods up to two hours. Plan a comparison that will indicate differences over time and/or location. Students should choose several locations in "still" or "disturbed" areas and expose plates for 20, 40, 60, and 120 minutes for example:

Still: a quiet location, outside, a quiet hallway or corridor, an exposed location in an unused room, a locker drawer.

Disturbed: an outside location near a construction site or playfield, a hallway with heavy pedestrian traffic, a **busy area of the classroom**.

After exposure, replace the petri **dish lids, and incubate the** plates upside-down for 24-48 hours at room temperature (~25°C).

Lab 2

Examine the surface of the agar for bacterial colonies. Note the number and variety of colonies. Incubate the plates upside down in the cold room for 1 week. As defined in Exercise 16.

Lab 3

Examine the surface for bacterial colonies. Note the number and variety of colonies. As defined in Exercise 16. Save the plates, wrap them in parafilm, and store in cold room. They will be used at a later time for microscopic identification and isolation of *Bacillus*.