How to avoid contamination by airborne conidia.

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Background

Because of its high growth rate (3 to 5 mm/hr) and the ease with which the powdery conidia become airborne, Neurospora has gained a reputation in some quarters as a laboratory contaminant. This reputation is largely undeserved. Cross-contamination or overgrowth of slow-growing cultures by Neurospora offers no serious threat in a well-ordered research laboratory. Good laboratory practice includes avoidance of drafts, attention to cleanliness, autoclaving of discarded cultures and contaminated glassware before dishes are washed, and care not to incubate cultures in closed containers where humidity approaches 100% and Neurospora may grow out of plates and through plugs in a film of water. Thousands of Neurospora strains are maintained in pure culture, without problems of contamination, in leading research laboratories and at the Fungal Genetics Stock Center. Neurospora is commonly used side-by- side with other microorganisms in the same laboratory, without significant cross-contamination.

Not surprisingly, someone accustomed to working with bacteria, yeast, Chlamydomonas, or a nonconidiating fungus such as Ustilago, Podospora, or Sordaria, may need to hold in check an impulse to open a petri dish and hold it up for inspection. Reasonable caution must be taken to make transfers near a Bunsen flame or alcohol lamp and to avoid carrying large masses of conidia through the air on a transfer needle.

Some laboratories set aside closed, draft-free transfer rooms which they may sterilize with ultraviolet lamps or spray with ethylene glycol to free the air of spores. We have never found such precautions necessary. In the Stanford Neurospora laboratory, transfers and platings are made at benches in the open laboratory after turning off forced-air vents of the air-conditioning system. The laboratory is arranged to minimize traffic behind the benches where transfers and platings are done. Exposed surfaces are wiped down periodically with water or alcohol. All contaminated glassware and finished cultures are autoclaved before going to the dishwasher or being discarded. If conidia happen to be released accidentally, surfaces are wiped down promptly using dilute hypochlorite or alcohol. A 60°C water bath may be used to inactivate conidia and minimize risk of scatter, because moist vegetative cells do not survive 30 minutes at that temperature.

Neurospora strains are available that do not produce airborne conidia. These are best known for special applications such as collecting unordered tetrads, examining ejected ascospores, or obtaining uncontaminated progeny from crosses involving *per-1*. They may also be preferred for use by inexperienced studentsto minimize scatter in teaching laboratories. The most commonly used strains that do not release conidia into the air are *fluffy* (Perkins *et al.* 1989), *easily wettable* (Selitrennikoff 1976, Sargent 1985), and *conidial separation* (Selitrennikoff 1974, Selitrenniikoff and Bailey 1974). For descriptions of these and other potentially useful mutants with similar properties , see the Neurospora Compendium (Perkins *et al.* 2001, http://www.fgsc.net/2000compendium/NewCompend.html, or http://www.bioinf.leeds.ac.uk/~gen6ar/newgenelist/genes/gene_list.htm).

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