

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## Basic Mold Showplate Set

The fungi comprise a major kingdom of eukaryotic organisms. Like plants, their cells are enclosed in cell walls; however, fungal cell walls contain chitin, not cellulose. Unlike plants, fungi are never autotrophs. They release digestive enzymes into their environment and absorb the digested food. They are most often saprophytes, parasites, or symbiotes.

Although most fungi are capable of producing sexual spores (spores resulting from meiosis), throughout most of their life cycle, they produce asexual spores. The molds that you examine in this activity are producing asexual spores, a stage often termed the imperfect stage of the life cycle. You will see representatives of two basic types: fungi that produce asexual spores within a sporangium, and those that produce asexual spores that are not enclosed in a sporangium.

### *Rhizopus*

Examine the plate culture of *Rhizopus* using a stereomicroscope or hand lens. You will find that *Rhizopus* consists of a growth of slender, branching filaments, which are called hyphae. Collectively the hyphae form the mycelium or the body of the fungus. This same growth form is found in *Aspergillus* and *Penicillium*, and many other fungi.

Note the numerous black dots. These are sporangia containing spores.

Place 2 drops of water on a microscope slide. Pass a dissecting needle through a burner flame and use it to remove some hyphae containing one or more sporangia from the plate and transfer this into the water on the slide. Pass the needle through the flame again. Place one edge of a coverslip against the slide, next to the water drop. Support the opposite edge of the coverslip with the needle and slowly lower the coverslip until it lies flat on the slide.

Observe your slide using the scanning and low-power lenses of a compound microscope. If you have been careful in placing the coverslip on the slide, the sporangia may be intact; however, you may find the sporangia have ruptured and released their spores. In either case, observe the sporangium so you can recognize a similar structure as you examine other fungi. The stalk that supports the sporangium is termed a sporangiophore. If you follow a sporangiophore to its base, you may find rhizoids that anchor the mycelium in the substrate. Keep your slide for comparison with the other fungi.

### *Aspergillus*

Examine the plate culture of *Aspergillus* using a stereomicroscope or hand lens. You will find that *Aspergillus* consists of a growth of slender, branching filaments, which are called hyphae. Collectively the hyphae form the mycelium or the body of the fungus.

Place 2 drops of water on a microscope slide. Pass a dissecting needle through a burner flame and use it to remove some hyphae from the plate and transfer them into the water on the slide. Pass the needle through the flame again. Place one edge of a coverslip against the slide, next to the water drop. Support the opposite edge of the coverslip with the needle and slowly lower the coverslip until it lies flat on the slide.

Observe your slide using the scanning and low-power lenses of a compound microscope. *Aspergillus* does not produce asexual spores in a sporangium. Instead, look for hyphae that end in swellings. The swellings will be covered with clusters of cells, which are the spores. Asexual fungal spores that are produced without a surrounding sporangial wall are called conidia.

## ***Penicillium***

Examine the plate culture of *Penicillium* using a stereomicroscope or hand lens. You will find that *Penicillium* consists of a growth of slender, branching filaments, which are called hyphae. Collectively, the hyphae form the mycelium or the body of the fungus.

Place 2 drops of water on a microscope slide. Pass a dissecting needle through a burner flame and use it to remove some hyphae from the plate and transfer them to the water on the slide. Pass the needle through the flame again. Place one edge of a coverslip against the slide, next to the water drop. Support the opposite edge of the coverslip with the needle and slowly lower the coverslip until it lies flat on the slide.

Observe your slide using the scanning and low-power lenses of a compound microscope. Look for the spores. Compare this slide of *Penicillium* with slides of *Aspergillus* and *Rhizopus*. Are the spores of *Penicillium* produced in a sporangium as are those of *Rhizopus*, or are they more like those of *Aspergillus*?

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Many mycologists (scientists who study fungi) use the term *mitospore* for the asexual spores of fungi. Why do you think they use that term (i.e., what does the term suggest)?

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## **Carolina Biological Supply Company**

2700 York Road, Burlington, North Carolina 27215  
Phone: 800.334.5551 • Fax: 800.222.7112  
Technical Support: 800.227.1150 • [www.carolina.com](http://www.carolina.com)  
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