

Slime Mold Video

View video of slime mold development.

This video is composed of a sequence of films created by John Tyler Bonner in the 1940s to show the life cycle of the cellular slime mold, *Dictyostelium discoideum*. As only the second person to study slime molds, Bonner frequently encountered audiences who had never heard of, let alone seen, the unusual organism. He therefore decided to create a film to present at seminars in order to introduce his object of study. The time-lapse film captivated audiences; indeed, Bonner has stated that the film “always stole the show”.

Bonner began working in the biology department at Princeton University in 1947 and although Princeton appears in the opening title, Bonner actually made the film for his senior thesis as an undergraduate at Harvard University with some early assistance from Frank Smith, a photographer. Although unsure of name of the device that was used for filming, he has described it as “the most amazing antique contraption that belonged to my professor, Wm. H. Weston. It consisted of a gigantic and very heavy set of brass gears that had numerous possible speeds that turned a crank on the side of an old 16 mm box camera that pointed into the ocular of a microscope. The electric motor that propelled it made such vibrations that the whole apparatus had to be on a separate table and not touching the microscope.”

Five subtitles identify the different film sequences: Amoebae, Aggregation, Migrating Pseudoplasmodia, Culmination, and Trisected Pseudoplasmodium. The first section, “Amoebae” shows individual amoebae migrating on an agar plate. The next section, “Aggregation” shows independent amoebae migrating together and forming aggregates from different levels of magnification. The first view focuses in closely on just a few cells, the second view zooms out to show a large number of amoebae forming aggregation streams, and finally there is a low power view that shows the aggregation response of a large number of amoebae. The third section is titled “Migrating Pseudoplasmodia” and shows the resulting aggregate, or pseudoplasmodium, which is commonly referred to as the “slug”, migrating across a surface. It also shows the splitting of a larger slug into two. After migration ceases, culmination begins, during which the slug differentiates into a fruiting body. The fourth section describes that the anterior cells of the slug form the stalk while the more posterior cells differentiate into the spore cells. The fifth and final section of the video shows an experiment (originally performed by Kenneth Raper, who discovered *Dictyostelium discoideum*) wherein an individual slug is severed into three pieces, all of which proceed to differentiate and develop into a full fruiting body.

This video was a powerful educational tool, generating interest and excitement about slime molds, and also the first film to capture the life cycle of the cellular slime molds. In his memoir, *Lives of a Biologist*, Bonner recalled the day when he visited Albert Einstein, who had requested to see his work. Bonner described how it led Einstein to ask questions that reached the core of development.

Sources

1. Bonner, John Tyler. *Lives of a Biologist*. Cambridge: Harvard University Press, 2002.