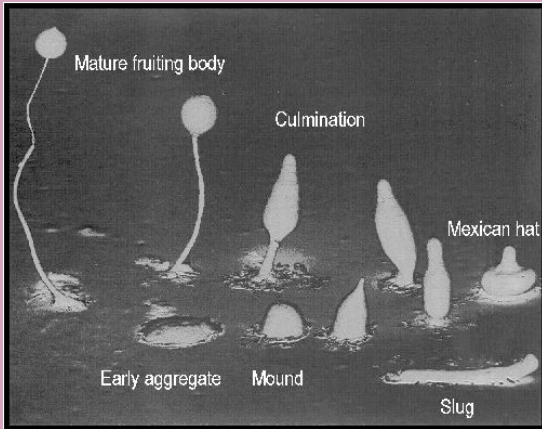
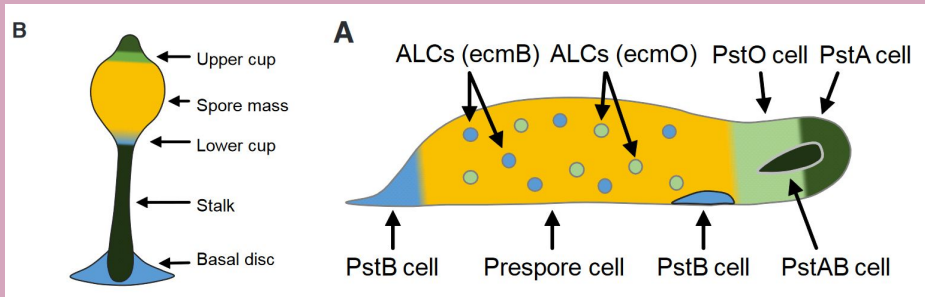


Dictyostelium discoideum



Dictyostelium discoideum is a cellular slime mold, spending large parts of their life in soil as single-celled amoebas feeding on bacteria, but under nutrient poor conditions aggregate into multicellular fruiting bodies. Under this event hundreds of thousands of amoebas aggregate and form a mound that later becomes a motile slug that can cross larger distances than individual amoebas, searching for better environmental conditions for the formation of the fruiting body, this requires the death of around 20% of the cells. Here two distinct parts of the fruiting body become apparent, the stalk formed by dead cells, and the sorus containing cells that will produce progeny. Large majority of the fruiting bodies formed will be clonal due to the patchy growth of amoebas, but some chimeric fruiting bodies do exist.

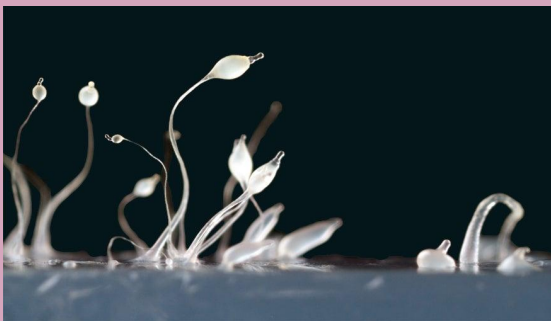
The single-celled amoebas use receptors such as GPCRs to sense when the nutrient supply is low and if the cell population is large enough to form a multicellular structure. If these conditions are met, a chemoattractant cAMP is secreted and the surrounding cells respond to it by aggregating. When the slug is forming the ratio between different cell types is tightly controlled, a precise 1:4 ratio between pre-stalk and pre-spore cells is kept. The figures A and B show the major cell type groups in the fruiting body, and the corresponding cell placement in the slug.



D. discoideum can complete both an asexual and a sexual cycle. During the sexual cycle, two cells possessing two different mating types from the three possible, fuse and secrete cAMP in order to attract other cells and form a macrocyst. There the fused cell undergoes meiosis and thereafter, multiple rounds of mitosis which results in formation of haploid amoebas.

Taxonomy

Domain: Eukaryota
Phylum: Amoebozoa
Class: Dictyostelia
Order: Dictyosteliales
Family: Dictyosteliaceae
Genus: Dictyostelium
Species: Dictyostelium discoideum



Cool facts:

- The slug is able to secrete cellulose and cellulose-associated proteins from its anterior cells, this forms a sheath that makes the slug motile. This sheath also protects the cellular slime mold from nematode predation.
- Spores of *D. discoideum* are still viable after passing through the digestive system of a nematode, this means that nematodes both aid and hinder the spread of this slime mold.

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