Dictyostelium Encyclopedia Article

Dictyostelium

The following sections of this BookRags Literature Study Guide is offprint from Gale's For Students Series: Presenting Analysis, Context, and Criticism on Commonly Studied Works: Introduction, Author Biography, Plot Summary, Characters, Themes, Style, Historical Context, Critical Overview, Criticism and Critical Essays, Media Adaptations, Topics for Further Study, Compare & Contrast, What Do I Read Next?, For Further Study, and Sources.

(c)1998-2002; (c)2002 by Gale. Gale is an imprint of The Gale Group, Inc., a division of Thomson Learning, Inc. Gale and Design and Thomson Learning are trademarks used herein under license.

The following sections, if they exist, are offprint from Beacham's Encyclopedia of Popular Fiction: "Social Concerns", "Thematic Overview", "Techniques", "Literary Precedents", "Key Questions", "Related Titles", "Adaptations", "Related Web Sites". (c)1994-2005, by Walton Beacham.

The following sections, if they exist, are offprint from Beacham's Guide to Literature for Young Adults: "About the Author", "Overview", "Setting", "Literary Qualities", "Social Sensitivity", "Topics for Discussion", "Ideas for Reports and Papers". (c)1994-2005, by Walton Beacham.

All other sections in this Literature Study Guide are owned and copyrighted by BookRags, Inc.

Contents

Dictyostelium Encyclopedia Article.....1

Contents.....2

Dictyostelium.....3

Dictyostelium

Dictyostelium discoideum, also know as slime **mold**, are single-celled soil amoeba which naturally occur amongst decaying leaves on the forest floor. Their natural food sources are **bacteria** that are engulfed by **phagocytosis**. Amoeba are eukaryotic organisms, that is, they organize their genes onto **chromosomes**. *Dictyostelium* may be either haploid (the vast majority) or diploid (approximately 1 in 10,000 cells).

There is no true sexual phase of development, although two haploid cells occasionally coalesce into a diploid organism. Diploid cells may lose chromosomes one by one to transition back to a haploid state. When food sources are plentiful, *D. discoideum* reproduces by duplicating its genome and dividing into two identical diploid daughter cells. Under starvation conditions, *Dictyostelium* enter an extraordinary alternate life cycle in which large populations of cells spontaneously aggregate and begin to behave much like a multicellular organism. Aggregation is initiated when a small proportion of cells emit pulses of cyclic AMP drawing in cells in the immediate vicinity. In this phase of the life cycle, groups of 100,000 cells coalesce and develop a surface sheath to form well-defined slugs (pseudoplasmodia), which can migrate together as a unit. As the pseudoplasmodium phase nears its end, cells near the tip of the slug begin to produce large quantities of cellulose that aids the slug in standing erect. This new phase is called culmination. At this stage, cells from the underlying mound move upward toward the vertical tip where they are encapsulated into spores forming the fruiting body. Spores then are dispersed into the environment where they can remain dormant until favorable conditions arise to resume the primary life mode as independent organisms. Spores are resistant to heat, dehydration, and lack of food sources. When a source of amino acids is detected in the environment, spores open longitudinally, releasing a small but normal functioning amoeba.

Dictyostelium are valuable biological model organisms for studying the principals of morphological development and signaling pathways.