

Dictyostelium: Model System and Stress

Group 9

Abstract

Slime mold *Dictyostelium discoideum* lives in the soil in the form of uninucleate amoebae.

INTRODUCTION

Dictyostelium discoideum has a unique developmental history. Uninucleate amoebae, or myxamoebae, is the form when cellular slime molds live in the soil as solitary. They prey on bacteria surrounding them and multiply.

Slug migration and fruiting body formation arise as a result of responses of the pseudoplasmodia to environmental alteration [1].

MATERIALS AND METHODS

Fruiting in *Dictyostelium* *Dictyostelium* was inoculated on the nutrient medium with prey bacteria to observe the growth of *Dictyostelium*. Firstly, 2-3 loopfuls of *E. coli* bacteria were spread in a strip in the center of two non-nutrient (NN) agar plates. (See materials on Appendix A.1)

RESULTS

Fruiting in *Dictyostelium* In the plate inoculated the *Dictyostelium*, *Dictyostelium* slug grew in the direction of the smeared *E. coli* (Fig.1(a)). In the plate without treatment, there were no other bacteria, except *E. coli* (Fig.1(b)).

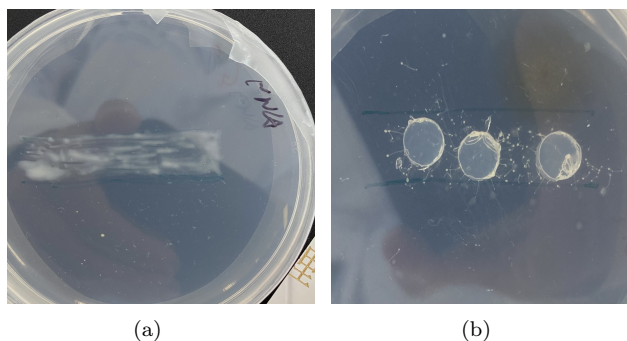


Fig. 1. Fruiting in *Dictyostelium*. (a) Non-nutrition agar with *E.coli*. The white band is the *E.coli* bacteria smeared on the NNA. (b) Non-nutrition agar with *E.coli* and *Dictyostelium*. The three discs were cut from the *Dictyostelium* stock and inverted into the *E.coli* band.

DISCUSSION

Cell differentiation and morphogenesis will happen in the growth of *Dictyostelium*, which is caused by gene expression and cell movement [2].

CONCLUSION

Three experiments were conducted respectively to verify the importance of the environment, the phototaxis of *D. discoideum*, and the effect of sugars and peptone on *D. discoideum* fruiting.

References

- [1] Peter C. Newell, Alvin Telser, and Maurice Sussman. Alternative Developmental Pathways Determined by Environmental Conditions in the Cellular Slime Mold *Dictyostelium discoideum*. *Journal of Bacteriology*, 100(2):763–768, November 1969.
- [2] Julian D Gross. Developmental Decisions in *Dictyostelium discoideum*. *MICROBIOL. REV.*, 58:22, 1994.

Appendix A Materials in the practical

A.1 Fruiting in *Dictyostelium*

- 1 Bunsen burner
- Toothpicks/blue tips
- 1 Mounted needle
- 1 Large loop
- 1 plate *E.coli* lawn grown on SM agar
- 2 plates non-nutrient agar (NNA)
- 1 plate *Dictyostelium* on steak of agar