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Adenylate energy charge during the life cycle of *Myxococcus coralloides* D

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1. SUMMARY

The adenylate energy charge of cells of *Myxococcus coralloides* D has been measured during the different stages of its life cycle. The energy charge of the vegetative cells (0.8) did not change significantly either during glycerol-induced myxospore formation, or during germination of these myxospores. Fruiting body myxospores had a relatively high energy charge (0.65). The adenylate energy charge decreased slightly (from 0.82 to 0.65) throughout fruiting body development and returned to values of vegetative cells in the early hours of germination of fruiting body myxospores. The levels of adenine nucleotide in myxospores in desiccation conditions were similar to those before desiccation.

2. INTRODUCTION

Myxobacteria are ideal microorganisms for studying the molecular basis of development and

social interactions. The life cycle of myxobacteria consists of vegetative growth, aggregation, fruiting body formation, myxospore formation and germination. A description of the biochemical events that occur at the cellular level during this life cycle is a prerequisite to an understanding of the regulation of myxobacteria development.

The adenylate energy charge, defined by Atkinson [1] as $[(\text{ATP}) + 1/2(\text{ADP})]/[(\text{ATP}) + (\text{ADP}) + (\text{AMP})]$, is a useful indicator of the metabolic state of the cell. The role of different purine compounds during the cellular morphogenesis of *Myxococcus xanthus* has been thoroughly studied [2–4], while research into adenine nucleotide and energy charge has been limited to some of the steps of cellular morphogenesis [5,6].

The aim of this work has been to extend our investigations into the life cycle of *Myxococcus coralloides* D [7] by determining the adenylate energy charge during all steps of the life cycle of this myxobacterium.

3. MATERIAL AND METHODS

3.1. Microorganism and growth conditions

Myxococcus coralloides strain D was obtained in our laboratory [8]. TT liquid medium for the

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