

The localization of polyphosphates at the external surface of the yeast cell.

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It is well known that yeast cells contain a high concentration of polyphosphates. According to some authors the polyphosphates are located exclusively in the vacuole (1), whereas Kulaev et al. presented evidence for the localization of high-polymer polyphosphates at the periphery of the cell (2).

Recently we found indications that part of the polyphosphates of the yeast *Saccharomyces fragilis* is located at the external surface of the cell. This is in accordance with metal ion binding experiments and with the hypothesis of transport-associated phosphorylation of glucose, with polyphosphate as phosphate donor (3).

The external localization of a polyphosphate fraction is suggested by the following facts:

- a) Toluidine blue added to a yeast suspension exhibits immediately a metachromatic effect, which is characteristic for negatively charged poly-electrolytes. This metachromatic effect is not observed with phosphate starved yeast, which has a very low polyphosphate content.
- b) By osmotic shock a polyphosphate fraction is liberated into the medium, without substantial leakage of intracellular constituents.

The polyphosphate fraction, liberated by osmotic shock, comprises in the log phase about 40% of the total amount of polyphosphate, as compared to about 9% in the stationary phase. It appeared to have a longer mean chain length than intracellular polyphosphate. This could be shown by gel filtration on sephadex. The difference in chain length between external and internal polyphosphate is much more pronounced in the log phase than in the stationary phase.

The polyphosphate fraction isolated by osmotic shock has a lower turn-over than intracellular polyphosphate, as shown by ³²P pulse experiments.

The differences in mean chain length and turn-over velocity suggest differences in metabolic fate of the two polyphosphate pools. In further experiments it will be tried to elucidate the metabolism and the physiological role of the two polyphosphate fractions

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- 2) Kulaev, I.S., (1975), Rev. Physiol. Biochem. Pharmacol., 73, 131.
- 3) Jaspers, H.T.A. and Steveninck, J. van, (1975), Biochim. Biophys. Acta, 406, 370.