

## Chemical factors between Japanese *Paramecium bursaria* and symbiotic *Chlorella*

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### SUMMARY

The endosymbiotic *Chlorella* in *Paramecium bursaria* are reported to provide photosynthate, maltose, which is the only confirmed material to maintain the symbiotic relationship between *Chlorella* and its host. We have studied on the role of low molecular weight compounds, maltose and amino acids, in the symbiosis. When endosymbiotic *Chlorella* F36-ZK was cultivated in dark, the amount of starch in cells decreased, which was quantified by HPLC analysis using PMP derivatization method after the degradation by  $\beta$ -amylase, and the cells could not release maltose. Furthermore, the re-infection rate of these cells to the host white cells also decreased. Those results indicated that maltose should be an important factor for the re-infection and the maltose release could occur when *Chlorella* cells stock enough starch. On the other hand, F36-ZK could grow using some amino acids as carbon sources in dark and the amount of starch in the cells did not change after the cultivation in dark. Therefore, it is speculated that amino acids are supplied by the host when *P. bursaria* is in dark, and thus the symbiont does not lose an ability of maltose release and stay alive for longer period than expected.