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## Symposium

### All you need is light? – Gain and loss of photosynthesis

Jens Boenigk, Gela Preisfeld

The acquisition of plastids by unicellular organisms allowed for a quantum leap in eukaryotic evolution, enabling population of nutrient poor, but light intensive surroundings. Major eukaryotic lineages as Archaeplastida, Rhizaria, Chromalveolata and Excavata show not only independent acquisition of plastids, but also multiple loss of photosynthetic ability.

This symposium is supposed to deal with the evolutionary acquisition and deprivation of plastids in various eukaryotic lineages and with their ecological causes. Form and function of gain and loss are as diverse as the protist lineages themselves. After adopting photosynthesis, supposedly as a measurement of changing nutrition conditions, several unicellular algae, like a number of Chromalveolates, still maintain the capability of phagocytosis. On the other hand as far as known all green Euglenids forfeit the skills of phagocytosis together with a complete reduction of the ingestion apparatus.

In many cases of plastid loss the remains of the plastid itself are obtained in the cell, in other cases plastids are totally reduced even without leaving genetic traces.

Questions that shall be raised in the symposium:

- What is the major force to give up the advantages of being able to perform photosynthesis?
- Does the presence of functional and reduced plastids reflect evolutionary history of eukaryotes?
- How cost intensive is (primary, secondary and tertiary) plastid acquisition as compared to plastid loss (including the current view on the 'chromalveolate hypothesis')?
- Do all photosynthetic lineages with the exception of Excavates build one phylogenetic supergroup so that the hypothesis of a single primary endosymbiotic event is supported?