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MOLECULAR BASIS OF AUTOTROPHIC VS MIXOTROPHIC GROWTH IN *CHLORELLA SOROKINIANA*

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In this work, we investigated the molecular basis of autotrophic *vs.* mixotrophic growth of *Chlorella sorokiniana*, one of the most productive microalgae species with high potential to produce biofuels, food and high value compounds. To increase biomass accumulation, photosynthetic microalgae are commonly cultivated in mixotrophic conditions, adding reduced carbon sources to the growth media. In the case of *C. sorokiniana*, the presence of acetate enhanced biomass, proteins, lipids and starch productivity when compared to autotrophic conditions. Despite decreased chlorophyll content, photosynthetic properties were essentially unaffected while differential gene expression profile revealed transcriptional regulation of several genes mainly involved in control of carbon flux. Interestingly, acetate assimilation caused upregulation of phosphoenolpyruvate carboxylase enzyme, enabling potential recovery of carbon atoms lost by acetate oxidation. The obtained results allowed to associate the increased productivity observed in mixotrophy in *C. sorokiniana* with a different gene regulation leading to a fine regulation of cell metabolism.