Expression studies of DGAT isoforms in *Nannochloropsis salina* grown under cold and nitrogen deprived conditions

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Marine microalga *Nannocholoropsis salina* is famous for its high oil yield, mainly triacylglycerides (TAGs) production as neutral storage lipids in response to nitrogen deprivation and environmental stresses. One most important response is accumulation of polyunsaturated fatty acid inside the cells to prevent cellular collapse and degradation of cell membranes. Genes encoding for these lipid biosynthesis enzymes can be found in various microalgae using advanced molecular techniques. We found out that *Nannochloropsis salina* can potentially accumulate more polyunsaturated fatty acids (PUFAs) under low temperatures and nitrogen deprivation as compared to optimal conditions. We recorded growth measurements along with photosynthetic measurements. We also studied the expression of genes involved in the Kennedy pathway for lipid synthesis using RT-PCR. We found out that there are four isoforms of the **DGAT** enzyme, which is involved in TAG formation. For current experimental setup, only one of them showed higher expression as compared to others. To compliment our gene expression studies with lipidomics, we performed FAME analysis and FT-ICR mass spectrometry to analyze lipids produced under stress conditions.

Key words: Lipidomics, RT-PCR, PUFAs, gene expression, Kennedy pathway, DGAT isoforms