

Interactive comment on “Nitrous oxide (N₂O) production in axenic *Chlorella vulgaris* cultures: evidence, putative pathways, and potential environmental impacts” by B. Guieysse et al.

Anonymous Referee #2

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The study by Guieysse et al. addresses a rather under-researched topic known for almost 3 decades now: Nitrous oxide production by microalgal and cyanobacterial cultures. Studies in this area of research are urgently needed of interest to many researchers. Although the basic finding that *Chlorella vulgaris* is capable of N₂O production is confirmatory, the authors speculate on N₂O formation pathways in *Chlorella vulgaris* based on experiments with nitrate reductase inhibitors, which is positive to guide future research. Further findings of the study included that nitrite rather than nitrate stimulate N₂O production. N₂O emissions of bioreactors with nitrate as N-source were significant due to accumulation of nitrite in the lower mM range. What is the significance of N₂O emissions by photo-bioreactors (% of global N₂O emissions per

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year)? If yes, would it be feasible to operate bioreactors with ammonium as N-source rather than nitrate? Might there be other strategies to mitigate N₂O emissions? Such questions need to be addressed to clarify the relevance of the study. P9742 L17 Please give x g rather than rpm P9744 L8-14 Was nitrate reductase activity shown and the effect of the inhibitor verified? P9745 L25 Please give reference for IC method.

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