Interaction of flow turbulence and nitrogen nutrients on the growth of *Scenedesmus quadricauda*

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Objectives
Research Hypothesis
(i) TN concentration and turbulence intensity have an interaction on algal growth.
(ii) The maximum biomass of algae is related to the mixing and homogenization effect of nutrients in the overall environment.
The improved Logist model could reflect quantitative mathematical relationship between the effects and algal population dynamics.

Methods
Custom-made turbulence generation devices with glass annular flumes and agitating electric grids were constructed to generate turbulence flow. An improved logistic model was further fitted to explore the interaction between turbulence and nutrients on the growth of *Scenedesmus quadricauda*.

**Results**

![Image of algae cell density and specific growth rate]

**Conclusions**

The study explores a mechanism of the interaction of TN concentration and turbulence intensity on algal growth. It posits that the change of metabolism activity (e.g., chlorophyll-a) induced by the interaction of TN and turbulence causes an increase in algal density, which could lead to algal blooms in eutrophic lakes. And effective microalgae cultivation methods can be developed for harvesting bioenergy through considering the optimal culture conditions used in the current study.