Lab 4: Uptake Kinetics – Michaelis-Menten

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This Lab Accompanies the Following Lecture

- **Slides:** Nutrient Uptake Kinetics
- **Reading:** Lecture 8b: Uptake Kinetics – Michaelis-Menten

Additional Reading

- **Paper:** Smit (2002)

Data For This Lab

- The nutrient uptake data – `BDC223_Lab_5_Rate calculations.xlsx`

Date

- **Lab Date:** 7 October 2024 (Monday)
- **Due Date:** 7:00, 14 October 2024 (Monday)

Students will work as individuals; assignments are per individual. This lab is due on Monday 14 October 2024 at 7:00 on iKamva.

1 Pre-Lab

Read this lab and contextualise within the pertinent material in your text.

2 Post-Lab

Upon completion of this lab:

- submit online on Monday 14 October 2024 at 7:00.

3 Task

In this practical, we will practice uptake kinetics calculations that plant biologists interested in nutrient uptake might encounter.

Please read the pertinent theory material in your text and listen to my recorded lectures. The relevant section dealing with the rate calculations is in the PDF slides from under the heading "Uptake kinetics experiments" to the end of "Michaelis-Menten," but other material in the slides appears elsewhere in the document.

4 Instructions

You may complete the assignment in your own time.

As part of the results presented in a properly formatted MS Word document, I would like to see:

- Graphs illustrating the depletion of nutrients over time.
- All calculations in the spreadsheet in the columns where '???' is indicated.
- V versus $[S]$ plots.
- Estimates for V_{max}, K_s and α
  - you can either derive them from the V versus $[S]$ plot
  - or, for extra credit, apply the Michaelis-Menten equation and provide parameter estimates along with estimates of their errors).
- An abstract that summarises your findings, along with a physiological rationale for these findings.

Ensure that your document is correctly structured (i.e., use headings relevant to the tasks mentioned above and present them in a logical sequence).

Refer to `Formatting requirements for all tasks.pdf` for further guidance.FOR YOUR ASSIGNMENT, PLEASE SUBMIT YOUR SPREADSHEET. NAME THE FILE AS FOLLOWS: `<YOUR_SURNAME>_UPTAKE_RATES.XLS`

Bibliography