

## Technology of Enzyme Functions

2 units (selection)

Yoshitoshi Nakamura · PROFESSOR / BIOLOGICAL REACTIONS, BIOLOGICAL SCIENCE AND TECHNOLOGY, EARTH AND LIFE ENVIRONMENTAL ENGINEERING

**Target** To understand recent progress in the research of enzyme functions

**Outline** Genetic recombination, development and control of bioreactor for increasing enzyme functions

**Style** Portfolio

**Requirement** /

**Goal** To understand recent progress in the research of genetic recombination, development and application of bioreactor for increasing enzyme functions

**Schedule**

1. Breeding and cultivation of genetic recombinant yeast having glucoamylase activity
2. Breeding and cultivation of glucoamylase-producing recombinant yeast with inactivation of MAT locus
3. Mathematical model for growth process of glucoamylase-producing recombinant yeast
4. Mathematical model for growth process of immobilized glucoamylase-producing recombinant yeast
5. Process analysis of continuous alcohol fermentation with glucoamylase-producing recombinant yeast
6. Recombinant Escherichia coli having over expression system of cloned gene for effective production of glucoamylase
7. Efficient production of recombinant protein using salt-out effect protecting against proteolytic degradation
8. Efficient production of recombinant protein using bioreactor with membrane filtration
9. Mathematical model of diauxic growth based on synthesis mechanism of inducible enzyme
10. Efficient production of inducible enzyme by exchange of substrates
11. Stability analysis of steady state in a continuous culture with diauxic growth
12. Mathematical model of immobilized cell culture with diauxic growth
13. Screening and cultivation of basidiomycete fungi having enzyme degrading undegradable aromatic compounds
14. Efficient production of enzyme degrading undegradable aromatic compounds by immobilized fungi

15. Development and application of bioreactor with enzyme degrading undegradable aromatic compounds

**Evaluation Criteria** Report (assignments count 100%)

**Textbook** To be introduced in the class

**Reference** To be introduced in the class

**Contents** <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216647>

**Student** Able to be taken by only specified class(es)

**Contact**

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(Office Hour: 水曜日 17:00-18:00)

**Note**

- ◇ When you take this class, it is necessary to do preparation for 2h and review for 2h every 2h class time for your understanding and taking credit.
- ◇ 成績評価に対する平常点と試験の比率は 50:50 とする。平常点には講義への参加状況、演習への回答及びレポートの提出状況と内容を含み、試験は中間テストと最終試験の成績を含む。