

The Hong Kong University of Science and Technology

Division of Life Science

LIFS 4150 Plant Biotechnology

Fall semester, 2022-23

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| Credits: | 3 (2 lectures + 1 tutorial) |
| Pre-requisites: | LIFS 2210 or LIFS 2040, and LIFS 3140 |
| Course Coordinator: | Prof. Ning Li |
| Instructors: | Prof. Ning Li, Dr. Amy Li, Prof. Joseph Wong |

Course Goals

This course introduces current status and future potential of plant biotechnology with emphasis on the fundamentals of plant molecular biology, proteomics and biotechnology. Using examples of marketable products from food industry, agriculture, aquaculture and TCM medicines, the role of basic research in the development of biotechnology products will be discussed. Students are expected to proactively participate in the class discussion about biotechnological principles, application and advancement throughout the semester. At the end of the course, students might be asked to form groups to present an innovative plant biotechnology proposal, which integrates the knowledge learnt from class and literature and translate them into potential applications.

Assessment Scheme

| <u>Components</u> | <u>Instructors</u> | <u>Percentage</u> |
|----------------------|--------------------|-------------------|
| Mid-term examination | NL & AL | 60% |
| Literature review | JW | 25% |
| Oral presentation | JW | 15% |

Teaching Schedule

| <u>Day</u> | <u>Time</u> | <u>Venue</u> |
|-------------------|-----------------|--------------|
| Monday | 13:30 – 14:20pm | LT-A |
| Wednesday | 13:30 – 14:20pm | LT-A |
| Friday (Tutorial) | 13:30 – 14:20pm | LT-A |

| Date | Topic | Instructor |
|--------------------------------|---|--------------------|
| Week 1 2, 5, 7, 9 Sep | Inducible promoters and agrobacterium-mediated DNA transfer | NL |
| Week 2 14, 16 Sep | Genetic engineering of herbicide-tolerant crops/ cotton fiber | NL |
| Week 3 19, 21, 23 Sep | Quantitative and functional PTM Proteomics and interactomics | NL |
| Week 4 26 Sep | Group Presentation introduction | JW |
| Week 4 28, 30 Sep | Medicinal plants & natural drug molecules | AL |
| Week 5 3, 5, 7 Oct | Plant tissue culture | AL |
| Week 6 10, 12, 14 Oct | Molecule extraction & bioassay | AL |
| Week 7 17, 19, 21 Oct | Edible vaccines & plantibodies | AL |
| Week 8 24 Oct | Revision | AL |
| Week 8 26 Oct | Mid-term examination | NL & AL |
| Week 8 28 Oct | Group Presentation introduction | JW |
| Week 9 31 Oct, 2, 4 Nov | Phycological (aquatic plants) Biotechnology I | JW |
| Week 10 7, 9, 11 Nov | Group presentation I | JW |
| Week 11 14, 16, 18 Nov | Group presentation II | JW |
| Week 12 21, 23, 25 Nov | Group presentation III | JW |
| Week 13 28, 30 Nov | Group presentation IV | JW |