

# MBMG615 Research Rotations in Molecular Biology

## Handbook 2023/2024

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Date revised: 18 July 2023

Poochit Nonejuie

# MBMG615 Research Rotations in Molecular Biology

Academic year 2023 (semester 2/2023)

## General guideline

The goals of the laboratory rotations are to introduce students to various ongoing research topics in the MGGE program and provide students opportunities to explore, by themselves, a variety of research laboratory environments under supervision of faculty members. Students are required to perform **3 lab rotations** with the faculty of the MGGE program. This course format encourages students to explore research varieties in the program and assists them to decide which research area and laboratory environment in molecular biology they want to pursue.

Lab rotations serve several functions.

- Students will have chances to discover various laboratories in detail which will help them decide where they will do thesis work according to research topics of interest, laboratory environments, and advisors
- Students will be exposed to different sub-disciplines and techniques in molecular biology and related fields that match their interest
- Students will have opportunities to perform meaningful experiments, improve laboratory skills, and learn how research is accomplished and also how laboratory operates.
- Students will obtain hands-on experience in real research laboratories giving them an opportunity to create substantial contact with faculty mentors and lab members.

## Before each rotation

Detail regarding the ongoing research from each lab will be presented to students by MGGE teaching staff during rotation orientation. Next, before starting each rotation, students should discuss their plans with the rotation mentor. This will help students find appropriate research experience during rotation that fits their main interests and supports their future goal. Importantly, students are strongly encouraged to make rotation arrangements in advance as space is not always available in all labs since rotation mentors can accept no more than 2 students per rotation period. Once the agreement between mentor and student has been made, the mentor must confirm the rotation spot of student with the course-coordinator via email ([Poochit.non@mahidol.ac.th](mailto:Poochit.non@mahidol.ac.th)) according to the timeline indicated in this guide book to officially secure the rotation spot.

## During each rotation

Since each rotation is **6 weeks in length** and spans across the main coursework, it is mainly emphasized on gaining research experience. Since students are expected to spend around **3-4 hours per week in the laboratory**, it is neither required nor expected that the rotation project will result in a

substantial body of work. However, students are expected to show enthusiasm and willingness to learn during the rotation period to promote maximum benefit.

#### **After each rotation**

At the end of each lab rotation, rotation mentor will submit the “ROTATION EVALUATION form (RR02)” to the course-coordinator. Note that mentors are encouraged to discuss the evaluation result with students. The rotation mentor will discuss both positive and negative aspects of the rotation with the student. The completed evaluation form will become a part of the student’s performance.

## Course Syllabus

MBMG 615 Research Rotations in Molecular Biology

Academic year 2023

**Course ID and Name:** MBMG 615 Research Rotations in Molecular Biology

**Course coordinator:** Poochit Nonejuie

Institute of Molecular Biosciences, Mahidol University

Tel: 0-2441-9003

Email: Poochit.non@mahidol.edu

### Instructors:

Prof. Chanan Angsuthanasombat, Ph.D.

Prof. Duncan R. Smith, Ph.D.

Assoc. Prof. Apinunt Udomkit, Ph.D.

Assoc. Prof. Chalernporn Ongvarrasopone, Ph.D.

Assoc. Prof. Chartchai Krittanai, Ph.D.

Assoc. Prof. Kanokporn Triwitayakorn, Ph.D.

Assoc. Prof. Panadda Boonserm, Ph.D.

Assoc. Prof. Saovaros Svasti, Ph.D.

Assoc. Prof. Sarin Chimnaronk, Ph.D.

Assoc. Prof. Surapon Piboonpocanun, Ph.D.

Asst. Prof. Chalongrat Noree, Ph.D.

Asst. Prof. Duangrudee Tanramluk, Ph.D.

Asst. Prof. Kusol Pootanakit, Ph.D.

Asst. Prof. Poochit Nonejuie, Ph.D.

Ittipat Meewan, Ph.D.

**Credits:** 2 (1-2-3)

**Curriculum:** Master of Science Program in Molecular Genetics and Genetic Engineering  
(elective course)

**Semester offering:** Second semester

**Pre-requisites:** None

**Expected learning outcomes:**

1.1 Students will acquire experience and skills in conducting various research in the areas of molecular biology and related disciplines with responsibility and integrity

1.2 Students will acquire professional and interpersonal skills through working in various laboratory environments and by personal time-management

**Alignment of teaching and assessment methods to course learning outcome:**

| Course learning outcome   | Teaching method  | Assessment methods                |
|---|--|-----------------------------------|
| 1. Students will acquire experience and skills in conducting various research in the areas of molecular biology and related disciplines with responsibility and integrity | - Hands-on laboratory experience<br><br>- Mentoring by PI of each rotation | - ROTATION<br><br>EVALUATION FORM |
| 2. Students will acquire professional and interpersonal skills through working in various laboratory environments and by personal time-management                         | - Hands-on laboratory experience<br><br>- Mentoring by PI of each rotation | - ROTATION<br><br>EVALUATION FORM |

**Course description:**

Research principles in Molecular Medical and Agricultural Biosciences; searching databases or literature related to the scientific research; performing experiments in Molecular Biology with research ethics awareness; responsibility to work assigned; communicating and working with others effectively; planning to achieve goals efficiently; analysis and interpretation of the experimental data

**Course schedule:**

Date: Weekdays

Time: Arranged by the mentor of each rotation

Place: Arranged by the mentor of each rotation

| Date                 | Topic/Details         | Number of Hours | Class Activity/Teaching Media                                 | Lecturer                   |
|----------------------|-----------------------|-----------------|---|----------------------------|
| August 2023          | Research orientation  | 15              | Interactive lecture   | All lecturers              |
| 11 Sep – 20 Oct 2023 | Laboratory Rotation 1 | 20              | Hands-on laboratory experience / Feedback from faculty mentor | Laboratory rotation mentor |
| 30 Oct – 8 Dec 2023  | Laboratory Rotation 2 | 20              |   |                            |
| 18 Dec – 26 Jan 2024 | Laboratory Rotation 3 | 20              |   |                            |

**Assessment Criteria:**

|                                  |                               |
|----------------------------------|-------------------------------|
| Participation during orientation | 35 %                          |
| Rotation performance evaluation  | 60 % (20% from each rotation) |
| Punctuality                      | 5 %                           |

Student's achievement will be graded using symbols: S (Satisfactory) and U (Unsatisfactory) based on the participation and performance from the whole course.

Important dates :

| Date                 | For student   | For faculty   |
|----------------------|---|---|
| August 2023          | Research Orientation  |   |
| 6 Sep 2023           | Email confirmation for Rotation 1 submission <u>to course-co</u> (rotation 1) |   |
| 11 Sep – 20 Oct 2023 | Rotation 1  |   |
| 25 Oct 2023          | Email confirmation for Rotation 2 submission <u>to course-co</u> (rotation 2) |   |
| 25 Oct 2023          |   | Complete ROTATION EVALUATION form submission <u>to course-co</u> (rotation 1) |
| 30 Oct – 8 Dec 2023  | Rotation 2  |   |
| 13 Dec 2023          | Email confirmation for Rotation 3 submission <u>to course-co</u> (rotation 3) |   |
| 13 Dec 2023          |   | Complete ROTATION EVALUATION form submission <u>to course-co</u> (rotation 2) |
| 18 Dec – 26 Jan 2024 | Rotation 3  |   |
| 31 Jan 2024          |   | Complete ROTATION EVALUATION form submission <u>to course-co</u> (rotation 3) |

Date revised: 18 July 2023



**MBMG615 Research Rotations in Molecular Biology**

**ROTATION EVALUATION form (RR02)**

**Student:** This form is to be completed by the student prior to the indicated deadlines (see course syllabus) and returned to the faculty mentor for evaluation

**Faculty mentor:** Please fill out the evaluation part for the named student. Please note:

- Faculty mentors are encouraged to discuss evaluation result with students.
- The complete and signed form should be delivered to the course coordinator by the student.

Student Name: \_\_\_\_\_ Student ID: \_\_\_\_\_

Faculty mentor: \_\_\_\_\_

Period:

- 1 (from 11 Sep – 20 Oct 2023)
- 2 (from 30 Oct – 8 Dec 2023)
- 3 (from 18 Dec – 26 Jan 2024)

**STUDENT PERFORMANCE EVALUATION** (to be completed by faculty mentor)

Please see the evaluation rubric at the back of this form.

| <i>Research and Professional skills (60%)</i> |           |   |      |   |              |   |   |                  |   |   |   |
|---|-----------|---|------|---|--------------|---|---|------------------|---|---|---|
| Criteria                                      | Excellent |   | Good |   | Satisfactory |   |   | Need improvement |   |   |   |
|   | 10        | 9 | 8    | 7 | 6            | 5 | 4 | 3                | 2 | 1 | 0 |
| Laboratory performance                        |           |   |      |   |              |   |   |                  |   |   |   |
| Time-management skill                         |           |   |      |   |              |   |   |                  |   |   |   |
| Safety practices                              |           |   |      |   |              |   |   |                  |   |   |   |
| Lab notebook                                  |           |   |      |   |              |   |   |                  |   |   |   |
| <i>Interpersonal skills (40%)</i>             |           |   |      |   |              |   |   |                  |   |   |   |
| Criteria                                      | Excellent |   | Good |   | Satisfactory |   |   | Need improvement |   |   |   |
|   | 10        | 9 | 8    | 7 | 6            | 5 | 4 | 3                | 2 | 1 | 0 |
| Communication skills                          |           |   |      |   |              |   |   |                  |   |   |   |
| Relationship with others                      |           |   |      |   |              |   |   |                  |   |   |   |
| Conflict Management and Responsibility        |           |   |      |   |              |   |   |                  |   |   |   |





Additional comments:

*SIGNATURES*

\_\_\_\_\_

Student Name

\_\_\_\_\_

Date

\_\_\_\_\_

Faculty Mentor

\_\_\_\_\_

Date



Rotation evaluation rubric

| Criteria                               | Excellent (10-9)  | Good (8-7)  | Satisfactory (6-4)   | Need improvement (3-0)   |
|--|---|---|--|--|
| Research and Professional skills (60%) | <b>Laboratory performance</b><br>Actively followed the instructions in the procedure with little or no assistance. If the procedure was not provided, the student was able to determine an appropriate experiment to satisfy the lab objectives independently.            | Followed the instructions in the procedure with some assistance. If the procedure was not provided, the student needed a little guidance about experiments to perform to satisfy the lab objectives.      | Had difficulty with some of the instructions in the procedure and needed clarification from the instructor or lab partner. If the procedure was not provided, student needed some guidance about experiments to perform to satisfy the lab objectives. | Had difficulty understanding the procedure and following the directions. Several mistakes were made during the experiment. If the procedure was not provided, student was incapable of designing a set of experiments to satisfy the given lab objectives. |
|  | <b>Time-management skill</b><br>Students is an efficient time manager, applies best effort to all projects and seeks out further challenges to improve skills.  | Student manages rotation time well and demonstrates good effort on all projects.  | Student does not manage rotation time efficiently and therefore does not make adequate progress on projects.   | Student wastes rotation time and make no progress on projects.   |
|  | <b>Safety practices</b><br>Lab was carried out with full attention to relevant safety procedures & directions. No incident occurred. Outstanding job cleaning up working area, tools and equipment. Lab tools were organized and stored with care                         | Lab was generally carried out with attention to relevant safety procedures & directions. No incident occurred. Good job on cleaning up working area, tools and equipment. Lab tools were properly stored. | Lab was carried out with some attention to relevant safety procedures & directions. A few incidents occurred. Had to be reminded to clean up area and equipment. Sometimes showed disorganized storage of lab tools.                                   | Safety procedures were ignored. Did not follow directions. Several incidents occurred. Did not clean up area and equipment after working. Showed disorganized storage of lab tools.  |
|  | <b>Lab notebook</b><br>Lab notebook was complete including procedure for each experiment, calculation, results and conclusion. Easy to follow.  | Lab notebook was sufficiently complete with only minor omissions.   | Lab notebook had partial information with major omissions.   | Lab notebook was incomplete and difficult to understand.   |
| Interpersonal skills (40%)             | <b>Communication skills</b><br>Engages in conversation in ways that facilitate others contributions by constructively building upon or synthesizing the contributions of others. Always listens attentively and respectfully to instructions.                             | Engages in conversation in ways that facilitate others contributions by restating the views of others and/or asking questions for clarification. Listens respectfully and quietly to instruction.         | Engages in conversation by taking turns and listening to others without interrupting. Often needs reminders to listen quietly and attentively to instruction.  | Does not engage in conversation nor listening to others. Student shows a lack of respect for self and others and/ or disrespect for teacher during instruction   |
|  | <b>Relationship with others</b><br>Student is always helpful and polite to others in the group. Shows genuine respect for individual differences and demonstrates good teamwork. Always uses appropriate and inoffensive language and begins topic related conversations. | Student is helpful and polite to members of their group. Demonstrates respect for individual difference and is cooperative. Student uses appropriate and unoffensive language in conversations.           | Student is sometimes impolite to members of their group. Student uses language that disrespects or offends others in the room at times. Does not always work cooperatively with teacher and others.  | Student is often rude when interacting with members of their group. Student consistently needs to be reminded to use appropriate and less offensive language.  |
|  | <b>Conflict Management and Responsibility</b><br>Student shows strengths in conflict resolution, accepts, gives, and uses constructive feedback well. Accepts total responsibility for personal behavior and acts in an ethical manner.                                   | Student resolves conflicts appropriately, gives, accepts, and uses constructive feedback. Accepts responsibility for personal behavior.   | Student has trouble resolving conflict or accepting, giving constructive feedback. Student often does not accept responsibility for own behavior and blames others.  | Student does not respond appropriately to conflict and has trouble handling emotions. Student often blames others and doesn't reflect on own behaviors.  |