MBMG615 Research Rotations in Molecular Biology

Academic year 2018 (semester 2/2018)

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

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 decision has been made, students must submit the complete and signed "MENTOR AGREEMENT FORM (RR01)" to the course-coordinator according to the timeline indicated in this guide book to officially secure the rotation spot. All rotation forms (RR forms) can be found at the back of this guide book.

During each rotation

Since each rotation is only 4 weeks in length, it is mainly emphasized on gaining research experience. It is neither required nor expected that the rotation project will result in a substantial body of work. However, students are expected to devote a substantial amount of time in the lab during the rotation period to ensure maximum benefit of students.

After each rotation

At the end of each lab rotation, students must write a short rotation summary and submit the "ROTATION REPORT and EVALUATION form (RR02)" to the mentor for evaluation. 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 and signed RR02 form will be

submitted to the course-coordinator and become a part of the student's performance. It is recommended that students obtain copies of all lab rotation evaluations for their records.

At the end

After completion of the course (all 3 rotations), students are required to choose only one topic from the rotation that most interests them for poster presentation. Students will present a research finding of the chosen topic to the public that includes a description of the research question, experiments attempted, interpretations, etc. The evaluation will be heavily weighed on efficient presentation and communication skills as well as scientific content by all attending lecturers using the "POSTER PRESENTATION SCORE SHEET (RR03").

Important dates:

Date	For student	For faculty
Nov 2018	Rotation Orientation & **MENTOR AGREEMENT FORM (RR01)** distribution	
Dec 24, 2018	**Complete MENTOR AGREEMENT FORM (RR01)** submission to course-co (rotation 1)	
Jan 7 – Feb 1, 2018	**Rotation 1**	
Feb 4, 2019	**Complete MENTOR AGREEMENT FORM (RR01)** submission to course-co (rotation 2)	
Feb 8, 2019	**ROTATION REPORT and STUDENT EVALUATION FORM (RR02)** submission to faculty mentor (rotation 1)	
Feb 15, 2019	**Complete ROTATION REPORT and STUDENT EVALUATION FORM (RR02)** to course-co (rotation 1)	
Feb 11 - Mar 8, 2019	**Rotation 2**	
Mar 11, 2019	**Complete MENTOR AGREEMENT FORM (RR01)** submission to course-co (rotation 3)	
Mar 15, 2019	**ROTATION REPORT and STUDENT EVALUATION FORM (RR02)** submission to faculty mentor (rotation 2)	
Mar 22, 2019	**Complete ROTATION REPORT and STUDENT EVALUATION FORM (RR02)** to course-co (rotation 2)	
Mar 18 – Apr 12, 2019	**Rotation 3**	
Apr 19, 2019	**ROTATION REPORT and STUDENT EVALUATION FORM (RR02)** submission to faculty mentor (rotation 3)	
Apr 26, 2019	**Complete ROTATION REPORT and STUDENT EVALUATION FORM (RR02)** to course-co (rotation 3)	
Apr 29, 2019	**Research forum/poster presentation**	
Apr 29, 2019		**POSTER PRESENTATION SCORE SHEET (RR03)** submission to course-co

Date revised: 15 November 2018

Course Syllabus

MBMG 615 Research Rotations in Molecular Biology

Academic year 2018

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 Ext 1339
Email: Poochit.non@mahidol.edu

Instructors:

Prof. Chanan Angsuthanasombat, Ph.D.
Prof. Duncan R. Smith, Ph.D.
Assoc. Prof. Albert J. Ketterman, Ph.D.
Assoc. Prof. Apinunt Udomkit, Ph.D.
Assoc. Prof. Chalermporn Ongvarasophon, 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. Surapon Piboonpocanun, Ph.D.
Assoc. Prof. Wipa Chungjatupornchai , Ph.D.
Asst. Prof. Kusol Pootanakit, Ph.D.
Asst. Prof. Sarin Chimnaronk, Ph.D.
Chalongrat Noree, Ph.D.
Duangrudee Tanramluk, Ph.D.
Gerd Katzenmeier, Ph.D.
Poochit Nonejuie, Ph.D.

Credits: 3 (0-9-3)
Curriculum: Master of Science Program in Molecular Genetics and Genetic Engineering (required 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

1.3 Students will acquire scientific communication skill via presenting of research findings to the public

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 - Mentoring by PI of each rotation	- **ROTATION REPORT and STUDENT EVALUATION FORM (RR02)**
2. Students will acquire professional and interpersonal skills through working in various laboratory environments and by personal time-management	- Hands-on laboratory experience - Mentoring by PI of each rotation	- **ROTATION REPORT and STUDENT EVALUATION FORM (RR02)**
3. Students will acquire scientific communication skill via presenting of research findings to the public	- Mentoring by PI of each rotation - Research presentation and discussions	- Research presentation to the public (**POSTER PRESENTATION SCORE SHEET (RR03))**

Course description:

Research principles in Molecular Medical and Agricultural Biosciences; searching databases or literature related to the project during each rotation; performing experiments in Molecular Biology with research ethics awareness; responsibility to the work assigned; communicating and working with others effectively; planning to achieve goals efficiently; analysis and interpretation of the experimental data; presentation of the results via a short seminar

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
7 Jan – 1 Feb, 2019	Laboratory Rotation 1	52	Hands-on laboratory experience / Feedback from faculty mentor	Laboratory rotation mentor
11 Feb – 8 Mar, 2019	Laboratory Rotation 2	52		
18 Mar – 12 Apr, 2019	Laboratory Rotation 3	52		
29 Apr 2019	**Rotation presentation**	14	Presentation	All lecturers

Assessment Criteria:

Student performance evaluation	30 % (10% from each rotation)
Rotation report	30 % (10% from each rotation)
Research presentation to public	40 %

Student's achievement will be graded using symbols: A, B+, B, C+, C based on the distribution of students' scores from the whole course.

RR forms

MBMG615 Research Rotations in Molecular Biology
MENTOR AGREEMENT FORM (RR01)

Student Name: _____ Student ID: _____

Faculty mentor: _____

FACULTY MENTOR AGREEMENT

Faculty – Please read and complete the following statement. Then, sign your signature on the appropriate line.

I, _____ representing the Molecular genetics and genetic engineering (MGGE) M.Sc. Program will act as the faculty mentor of_____ during "MBMG615 Research Rotations in Molecular Biology" lab rotation (choose only 1 option)

☐ 1 (from Jan 7, 2019 to Feb 1, 2019)

☐ 2 (from Feb 11, 2019 to Mar 8, 2019)

☐ 3 (from Mar 18, 2019 to Apr 12, 2019)

and I **am** on the list of lecturers that are eligible for the MBMG615 course academic year 2018 indicated on the MBMG615 TQF3 document (please see detail on the second page).

SIGNATURES

_____ _____
Student Name Date

_____ _____
Faculty Mentor Date

_____ _____
Poochit Nonejuie Date
(MBMG615 Course coordinator)

This form is to be completed by the faculty mentor once an agreement has been made between the student and mentor prior to the beginning of the lab rotation. Students are responsible to return the form singed by student and faculty mentor to the MBMG615 course coordinator prior to the indicated deadlines (see course syllabus).

Lecturers that are eligible for the MBMG615 academic year 2018

Prof. Chanan Angsuthanasombat, Ph.D.
Prof. Duncan R. Smith, Ph.D.
Assoc. Prof. Albert J. Ketterman, Ph.D.
Assoc. Prof. Apinunt Udomkit, Ph.D.
Assoc. Prof. Chalermporn Ongvarasophon, 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. Surapon Piboonpocanun, Ph.D.
Assoc. Prof. Wipa Chungjatupornchai, Ph.D.
Asst. Prof. Kusol Pootanakit, Ph.D.
Asst. Prof. Sarin Chimnaronk, Ph.D.
Chalongrat Noree, Ph.D.
Duangrudee Tanramluk, Ph.D.
Gerd Katzenmeier, Ph.D.
Poochit Nonejuie, Ph.D.

MBMG615 Research Rotations in Molecular Biology
ROTATION REPORT and 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:

- The student MUST provide the completed ROTATION REPORT section prior to evaluation
- 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 Jan 7, 2019 to Feb 1, 2019)
☐ 2 (from Feb 11, 2019 to Mar 8, 2019)
☐ 3 (from Mar 18, 2019 to Apr 12, 2019)

ROTATION REPORT (to be completed by student)

Please describe your work during rotation including objectives and outcomes (500 words max)

ROTATION REPORT and STUDENT EVALUATION (to be completed by faculty mentor)

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

Rotation report (50%)				
Criteria	**Excellent (4)**	**Good (3)**	**Satisfactory (2)**	**Need improvement (1)**
Description of the rotation objective				
Scientific explanation of results/outcomes obtained during rotation				
Student performance: Professional skills (25%)				
Criteria	**Excellent (4)**	**Good (3)**	**Satisfactory (2)**	**Need improvement (1)**
Laboratory performance				
Time-management skill				
Safety practices				
Student performance: Interpersonal skills (25%)				
Criteria	**Excellent (4)**	**Good (3)**	**Satisfactory (2)**	**Need improvement (1)**
Communication skills				
Relationship with others				
Conflict Management and Responsibility				

Additional comments:

SIGNATURES

_____ _____

Student Name Date

_____ _____

Faculty Mentor Date

Evaluation rubric

	Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Need improvement (1)
Short lab rotation report (50%)	Description of the rotation objective	Clearly describe the objective of the rotation	Adequetly describe the objective of the rotation	The objective of the rotation was given but not complete	The objective of the rotation was not given
	Scientific explanation of results/outcomes obtained during rotation	Reasonable scientific explanations for the results were discussed and logically analyzed. Provided description of what was learned, possible sources of error, suggestions for improving the experiment.	Scientific explanations for the results were given. Provided description of what was learned and possible sources of error.	Scientific explanations for the results were given but incomplete or inaccurate. Description of what was learned and possible sources of error were missing.	Scientific explanations for the results were not given. Description of what was learned and possible sources of error were missing.
Student performance: Professional skills (25%)	Laboratory performance	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.
	Time-management skill	Students is an efficient time mananger, 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 effiently and therefore does not make adequate progress on projects.	Student wastes rotation time and make no progress on projects.
	Safety practices	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.
Student performance: Interpersonal skills (25%)	Communication skills	Engages in conversation in ways that facilitate others contributions by constructively building upon or synthesizing the contributions of others. Always listens attentively and respectively 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 repect for self and others and/ or disrespect for teacher during instruction
	Relationship with others	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. Demonstartes 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 disrepects 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 consistantly needs to be reminded to use appropriate and less offensive language.
	Conflict Management and Responsibility	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.

MBMG615 Research Rotations in Molecular Biology
POSTER PRESENTATION SCORE SHEET (RR03)

Presenter name_____ Poster Number_____

Evaluator name_____ Date/Time_____

POSTER PRESENTATION SCORE (to be completed by faculty)
Please see the poster evaluation rubric at the back of this form.

Poster score				
Criteria	**Excellent (4)**	**Good (3)**	**Satisfactory (2)**	**Need improvement (1)**
Scientific content (20%)				
Visual Presentation (20%)				
Documentation of Sources (15%)				
Spelling & Grammar (5%)				
Student performance score				
Criteria	**Excellent (4)**	**Good (3)**	**Satisfactory (2)**	**Need improvement (1)**
Presentation level (20%)				
Response to questions (20%)				

Additional comments:

Poster evaluation rubric

	Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Need improvement (1)
Poster score	Scientific content (20%)	Prominently positions title/authors of research thoroughly but concisely presents main points of introduction, hypotheses/ propositions, research methods, results, and conclusions in a well-organized manner.	Contains title/authors of research, adequately presents main points of introduction, hypotheses/ proposition, research methods, results, and conclusions in a fairly well-organized manner.	Contains title/authors of research, presents main points of introduction, hypotheses/ propositions, research methods, results, and conclusions but not sufficiently and not well-organized.	Title/authors absent. Does not sufficiently present main points of introduction, hypotheses/ propositions, research methods, results, and conclusions and is not well-organized.
	Visual Presentation (20%)	Overall visually appealing; not cluttered; colors and patterns enhance readability; Uses font sizes/variations which facilitate the organization, presentation, and readability of the research. Graphics (e.g., tables, figures, etc.) are engaging and enhance the text is clearly arranged so that the viewer can understand order without narration	Overall visually appealing; not cluttered; colors and patterns support readability. Adequate use of font sizes/variations to facilitate the organization, presentation, and readability of the research. Graphics (e.g. tables, figures, etc.) enhance the text content is arranged so that the viewer can understand order without narration.	Visual appeal is adequate; somewhat cluttered; colors and patterns detract from readability. Use of font sizes/variations is somewhat inconsistent/distractions. Graphics (e.g., tables, figures, etc.) adequately enhance the text. Content arrangement is somewhat confusing and does not adequately assist the viewer in understanding order without narration.	Not very visually appealing; cluttered; colors and patterns hinder readability. Use of font sizes/variations is inconsistent/distracting. Graphics (e.g., tables, figures, etc.) do not enhance the text. Content arrangement is confusing and does not adequately assist the viewer in understanding order without narration
	Documentation of Sources (15%)	Cites all data obtained from other sources. Citation style is accurate. No spelling & grammar mistakes.	Cites most data obtained from other sources. Citation style is accurate	Cites some data obtained from other sources. Citation style is either inconsistent or incorrect.	Does not cite sources.
	Spelling & Grammar (5%)	No spelling & grammar mistakes	Minimal spelling & grammar mistakes	Noticeable spelling and grammar mistakes	Excessive spelling and/or grammar mistakes
Student performance score	Presentation level (20%)	Narration is engaging, thorough, and adds greatly to the presentation. The audience's attention has been drawn and engaged.	Narration is adequate and adds to the presentation. The audience's attention has been maintained.	Narration is somewhat lacking. The audience's attention is weak.	Narration is lacking. The audience is not paying attention.
	Response to questions (20%)	Presenters demonstrate full knowledge of the material and can explain and elaborate on questions.	Presenters have sufficient knowledge of the material to answer questions	Presenters have difficulty answering questions beyond a basic level.	Presenters cannot answer questions