



## Qualifying Exam Guidelines for NTU CHEM

### I. Eligibility and Overview

- a. Effective from **academic year 107**, Ph.D. students are eligible to apply to take thesis proposal exam as qualifying exam after passing 2 advanced level courses, and must take the qualifying exam before the course start day in the fifth semester of study.
- b. Advanced level courses: Discussion in Advanced Chemical Biology I, Discussion in Advanced Chemical Biology II, Experimental Molecular Biophysics, others (please check with the programme).
- c. The exam consists of two parts, the written portion (thesis proposal) and the oral portion.
- d. The student should submit the application form, official transcript and a thesis proposal\*\* to the programme secretary at least **3 weeks** before the scheduled oral presentation\*\* date.
- e. Students are required to fulfil requirements of both portions in order to continue in the programme.
- f. Six months after passing the qualifying exam, students are eligible to apply for oral defense.

#### \*Thesis proposal format:

The proposal should be written in English with maximum of 15 pages excluding reference in length. The proposal should include a title with no more than two lines, an abstract, a research background and motivation, specific aims, the approaches to be taken to achieve the specific aims, and preliminary results.

#### \*\*Oral presentation

The student should give an oral presentation based on the proposal in English. Each member of examination committee will indicate “pass” or “fail” on the student’s oral exam form. The student must get a majority of pass votes in order to pass the qualifying exam.

### II. Examination Committee

At least three faculty members from either AS, NTU, or NTHU will serve as the examination committee. The student’s thesis advisor should not serve on the oral examination committee, but can attend the close door presentation.

### III. Make-up examination

One make-up exam is permitted if a student fails the first examination. The exam must be completed within **one year** after the date of the evaluation result is released.

### IV. Evaluation criteria

The oral examination committee will assess student based on his/her performance during the exam. The evaluation will be based on creativity, logic, feasibility, research approach, background knowledge, PowerPoint presentation, oral presentation and response to questions. If the student’s performance on the oral presentation does not meet Oral Examination Committee’s expectation but the Committee thinks a significant level has been achieved, the Oral Examination Committee can award a “Conditional Pass” that requires students to do another presentation again or adjust his/her reports within a given time frame.



## Guidelines for Preparing a Thesis Proposal

The format of the proposal is **12-point type throughout, Time New Roman black font, single spacing with 2.5 cm margins on all sides.**

The proposal should contain the following elements:

- a. Title
- b. Abstract
- c. Specific aims
- d. Background/Significance
- e. Experimental design and methods
- f. Discussion
- g. References

### Specific Instructions

- a. **Title Page:** (including a title, your name, the date and time of the exam)

Title should be fewer than two lines in length. It should reflect the central theme/study.

- b. **Abstract:** (1 paragraph, no more than one page)

Abstract is a paragraph conveying the concept and significance of the work. It should briefly and concisely describe background information, significance of the study, and approaches taken to address these issues/aims. References should not be cited in the abstract.

- c. **Specific Aims:** (No more than 1/2 page)

State concisely the goals of the proposed research. List 2-4 aims that are achievable within three years. Each aim should be stated in one or two sentences. Specific aims should reflect the central theme and questions/issues to be examined. They can be from hypothesis testing, creation of novel designs, solutions for specific problems, challenges of existing paradigms, clinical practices, or critical barriers to progress in the field or development of new technologies. Student may summarise the expected outcomes and the impact of the proposed research at the end.

- d. **Background and Significance:** (maximum 3 pages)

Provide a sufficient introduction to the area of research, including a rationale for the proposal as suggested below:

- ◆ Critically evaluate existing knowledge and explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses. State concisely the importance of the proposed research by relating the specific aims to the broad and long-term objectives.
- ◆ Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
- ◆ Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

**e. Experimental Design and Methods:** (3-6 pages)

Describe the experimental approaches for achieving the specific aims listed above and explain the rationale for each experiment in sufficient details.

- ◆ List each “Specific Aim” and describe the experiments/methods and controls (without intricate details) to be carried out to achieve the “Specific Aim”.
- ◆ Explain the rationale for each experiment and how the experimental outcome will verify your hypothesis/questions.
- ◆ Describe how the data will be collected, analysed and interpreted.
- ◆ Discuss the potential difficulties and limitations of the proposed experiments/methods and propose alternative experimental approaches.

**f. Discussion:** (1-2 pages)

Speculate the possible outcome (positive or negative) and their scientific implications. Propose additional experiments/approaches for each outcome to verify or further advance the scientific knowledge.

**g. References:**

A complete list of authors, year, title, journal and pages must be given. The “Journal of Molecular Biology” style as shown in the examples below, is recommended.<sup>1,2</sup>

1. Abouzied, M. M., Baader, S. L., Dietz, F., Kappler, J., Gieselmann, V. & Franken, S. (2003). Expression patterns and different subcellular localization of growth factors HDGF and HRP-3 suggest functions in addition to their mitogenic activity. *Biochem. J.* 378, 169-176.
2. Abragam, A. (1961). *The Principles of Nuclear Magnetism*, Chap. VIII pp. 164-322, Clarendon Press, Oxford, UK.