CONSIDER FOR TALK

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Corresponding Faculty Member: Hui-Min Chung (hchung@uwf.edu)

Adopting a Phage-Hunting Course to Enrich Undergraduate Research Experience in Taiwan

Hui-Min Chung, Carton Chen\*, Ting-Wen Chen\*, Nai-Chun Lin\*

Course-based research experiences (CRE) have greatly improved the scale of undergraduate research in the US since the 2000s. While universities in Taiwan value undergraduate research experiences, most schools take the conventional approach of apprenticing in individual research labs. In 2019, we decided to test the CRE approach by implementing the phage-hunting project in the course offered by the Department of Agricultural Chemistry in National Taiwan University (NTU). The goals were to find out if students in Taiwan welcome the new approach, and to discover modifications needed for implementing the courses to the local academical setting. The project was first implemented in the courses of Environmental Microbiology Laboratory in Fall 2019. Fifteen students participated in the course and 14 phages were isolated using Streptomyces griseus as the host. Based on the survey done at the end of fall 2019, the majority of participant students welcome the CRE approach and would like to see its implementation in future semesters. The responses greatly encouraged us to continue offering the same course in Fall 2020, and six phages were isolated. The genome of one of the phages TaidaOne was sequenced and annotated using the DNA Master and PECAAN in a follow-up course Special Topics in Microbiology in Spring 2020. The sequence data were submitted to PhagesDB with the support from the SEA-PHAGES team. To promote and support CRE courses in NTU and other universities in Taiwan in adopting the phage hunting project, we established the Phage Ensemble in Taiwan (PET) program. Here, we discuss the lessons learned in 2019-2021 regarding the success and aspects required improvement for course implementation, and current work at PET. In addition to giving presentations in local scientific conferences, PET is taking steps in improving course design and experimental protocols, training teaching assistants and faculty members, establishing DNA sequencing and assembly channels, and securing funding support, etc.

*: Drs. Carnton Chen and Ting-Wen Chen are retired faculty and faculty from National Yang Ming Chiao Tung University respectively, and Dr. Nai-Chun Lin is faculty from National Taiwan University.*