

# The Faculty of Biotechnology and Food Engineering

## M.Sc. Graduate Seminar

**Zhiyun Yang / יאנג שי-יון**

**Advisors:** Prof. Ka Yin Leung & Prof. Sima Yaron

### Research Topic:

**Identification of novel type III secretion system effectors in *Edwardsiella anguillarum* ET080813**

**\*\*\*Lecture will be held in English\*\*\***

### Abstract

Fish diseases are a major threat to the sustainability of the aquaculture industry globally. *Edwardsiella* species are common and important pathogens of freshwater and marine fish, which lead to severe economic losses in aquaculture worldwide. The Type III Secretion System (T3SS) is an important weapon of these pathogens, since it secretes virulence factors (effector proteins) to assist the bacteria's invasion and escape from the host's immune defense. However, research on virulence mechanisms of *Edwardsiella* is still in the early stage, especially in the newly identified species, *Edwardsiella anguillarum*. We have hypothesized that *E. anguillarum* can secrete many novel effectors, since it possesses two distinct T3SSs, and our aim was to discover these effectors. Based on bioinformatics analysis, including machine learning and sequence homology, our results showed that more than 10 putative effectors are encoded in the genome of the *E. anguillarum* type strain ET080813. A phosphorylated mutant of the global regulator, EsrB, was used to turn on T3SSs *in vitro*. Secretome and transcriptome analyses were further performed to compare differential expression and secretion of the bacterial proteins. Based on the results we have shortlisted 56 candidate effectors for further studied. Furthermore, our invasion assay results indicated that *E. anguillarum* ET080813 is able to internalize and replicate within host cells. Further characterization of these T3SSs secreted effectors will benefit the development of new therapeutic strategies for the treatment of *Edwardsiella* bacterial diseases.

**Monday, 14/9/2020, 14:00 – 14:30**

**Meeting ID: 634 265 2141**

**<https://gtiit.zoom.com.cn/j/6342652141>**