**課程名稱: The molecular mechanisms of the programmed cell death**

**細胞程序性死亡的分子機轉**

課程學分：2學分

必選修：選修

開課學期：上學期

課程負責教師：蔣輯武老師

核心能力

■ 閱讀、理解與運用專業知識

培養學生具備一般及專業領域的研究素養，並富有國際視野之科學涵養

Good reading comprehension of scientific materials and excellent capabilities in applying professional knowledge

To train students to have good backgrounds in general and specialized fields and have global views of science

■ 彙整新知與良好的溝通能力

培養學生具備彙整分子醫學新知與溝通表達研究成果的能力

Abilities of updating and organizing innovative knowledge and demonstrating good communicational skills

To train students to learn efficiently and to apply their knowledge effectively

■ 解決研究問題的能力

培養學生具備獨立思考與從事分子醫學相關研究領域的能力

Problem-solving skills

To train students to become independent thinkers capable of conducting independent and innovative research in molecular medicine

**基本素養：**無

**課程概述**

旨在傳授有關細胞程序性死亡的分子機轉，特別是在細胞凋亡的方面。此課程的內容包含細胞程序性死亡及細胞凋亡的基本概念以及調控這些細胞死亡的分子機轉。指引學生對細胞程序性死亡能有更深入的瞭解，並探討在細胞程序性死亡研究領域的最新發現。

This course covers the topics of molecular mechanisms that regulate the programmed cell death (PCD), especially on apoptosis. Topics include an overview of PCD; introduction to apoptosis; molecular mechanisms regulating apoptosis and other non-apoptotic PCD such as necroptosis, pyroptosis and ferroptosis. The primary goal of this course is to let students gain mechanistic insights regarding apoptosis and non-apoptotic PCD and learn recent findings in the PCD field.

**先修科目或先備能力 Prerequisite Course(s)：**基礎生物學

**課程學習目標 Course Objectives**

1. To let students gain insights and learn recent findings in the programmed cell death field

2. To train students to learn efficiently and to apply their knowledge effectively

3. To train students to have good backgrounds in general and in specialized fields

**課程進度 Progress Description**

1. Introduction to the programmed cell death and apoptosis

2. The programmed cell death in C. elegans

3. The programmed cell death in development of Drosophila

4. The programmed cell death in murine development

5. The prosurvival Bcl-2 protein family

6. The pro-apoptotic Bcl-2 protein family

7. Mitochondria and apoptosis

8. Caspases

9. The extrinsic pathway of apoptosis

10. Apoptosis in the nervous system

11. Application of apoptosis in therapeutics

12. Non-apoptosis PCD I : Entosis, necroptosis, and autosis

13. Non-apoptosis PCD II : Ferroptosis

14. Pathogens and PCD

15. Autophagy and apoptosis

16. Discussions on recent findings of PCD

**教學方法 Teaching Strategies**

1. 講授 Lecture 70%

2. 討論Discussion 20%

3. 報告Presentation 10%

**課程教材 Course Material**

Review articles and recent published research articles on PCD-related field

**參考書目 References**

Review articles and recent published research articles on PCD-related field

**評量方式 Grading**

1出席 Participation 10%

2個人口頭報告 Presentations 40%

3期末書面報告Final report 40%

4其他 others 上課互動 10%