

## 生命科學系 99 學年度上學期課程大綱

科號		組別		學分 <sup>2</sup>	人數限制 <sup>0</sup>
科目中文名稱	細胞機械學與細胞遷移特論二		教室		
科目英文名稱	Special topics on Cell Mechanics and Cell migration I				
任課教師	王歐力 Oliver Wagner				
上課時間	M3M4				
擋修科目			擋修分數		
一、課程說明	<p>Many basic cellular processes, including chemotaxis, phagocytosis and cell-cell adhesion require interactions between the plasma membrane and the underlying cytoskeleton which is a dynamic, three-dimensional and fibrillar structure that spans the cytoplasm. Some of the nano-polymers comprising the cytoskeleton (actin and microtubules) act as a "track" on which motor proteins can move organelles, vesicles, mRNA and chromosomes. Mechanical forces play an essential role in cellular processes and various protein complexes in the cell are designed to handle, transform and use such forces. For example muscle proteins and the extracellular matrix can withstand considerable stretching forces while hearing-related and mechanosensory proteins can transform weak mechanical stimuli into electrical signal. Cellular movement is accomplished by cilia, flagella and actin polymerisation at the leading edge of motile cells. Precise and directed cell migration is critical for proper embryonic development. The failure of cells to migrate can result in life threatening consequences as severe inflammatory diseases and metastasis. Understanding cell mechanics and migration is becoming increasingly important to biomedical engineers (skin transplantation, fabrication of artificial tissues).</p>				
二、指定用書	Current cell biology textbook chapters ("Alberts", Lodish", "Pollard" etc.) related to the cytoskeleton, cell division, organelle and cell motility.				
三、參考書籍					
四、教學方式	Special seminar for advanced cell biology students. Lecture and student's journal presentations.				
五、教學進度	2 hourly seminar				
六、成績考核	Attendance: 20%. Performance: 35%. Presentation: 45%				
七、講義位址 http://	Handouts Wagner-Lab: <a href="http://life.nthu.edu.tw/~laboiw/Handouts/index.html">http://life.nthu.edu.tw/~laboiw/Handouts/index.html</a>				

