## 國立清華大學 105 學年第 2 學期新開課程課程大綱

科號	LSMC	組別		學分	1	人數限制	20
修課年級	<ul><li>◆ 大學部 四 年級以上</li><li>□ 碩士班一年級以上(含博士班)</li><li>□ 碩士班二年級以上(含博士班)</li></ul>						
上課時間	W6		教室	二館 107 教室			
科目中文名稱	進階細胞生物實驗技術						
科目英文名稱	Advanced Experimental Approaches in Cell Biology						
任課教師	王慧菁						
擋修科目			打	當修分	數		

## ※下列各欄由任課教師提供※

一、課程說明	This course aims to provide fundamental knowledge in experimental techniques in the field of cell biology. Each lecture will focus on one		
	or two specific experimental approaches and provide with		
	background information and implication.		
二、指定用書	Online information		
	http://cshprotocols.cshlp.org/site/Taxonomy/cell_biology_l1.xhtml		
三、參考書籍	1. Cold Spring Harbor Protocols in Cell Biology		
	http://cshprotocols.cshlp.org/site/Taxonomy/cell_biology_l1.xhtml		
	2. Current Protocols in Cell Biology (Wiley)		
四、教學方式	Each lecture will have 40 minutes lecture time plus 10 minutes		
	discussion.		
五、教學進度	Provided in the following table.		
六、成績考核	出席 20%, 口頭報告 40%, 紙本報告 40%		
七、講義位址			
http://			

## 教學進度(Syllabus)

D2/15   Paul Kubes   In vivo Imaging	Date	Lecture	Techniques	Student report
Cell culture	02/15	Paul Kubes		•
extracellular matrix, environmental factors and culture accessories in 2D and 3D culture	02/22	Cell culture		
factors and culture accessories in 2D and 3D culture			component, growth factors,	
and 3D culture				
Nucleic acid delivery   Nuc				
delivery   nanoparticles, and other methods for gene delivery     03/08   Analysis of gene expression   RT-PCR, Northern blotting, cDNA microarray, and deep sequencing     03/15   Analysis of protein protein expression   Proteomics     03/22   Metabolic labeling   Metabolic labeling and protein labeling   Protein modification   Proteomics     03/29   Growth and differentiation   Control of growth speed, measure cell viability, stem cell culture and differentiation     04/05   Suspended (Lily abroad)     04/12   Cell cycle   Flow cytometry, synchronization, sorting   Proteomics     04/19   Immunostaining   Immunohistochemical and immunofluorescence staining     04/26   Cell behavior   Migration, invasion, attachment, particle tracking   Erck particle tracking     05/03   Microscopy   Microscope, objects, device setting, light path, and camera   \$\frac{3}{3}\frac{3}{				
gene delivery	03/01			
O3/08   Analysis of gene expression   RT-PCR, Northern blotting, cDNA microarray, and deep sequencing   O3/15   Analysis of protein expression   Western blotting, Affinity purification, Proteomics   P天能 gibble   Particular		delivery		
expression microarray, and deep sequencing  03/15 Analysis of protein expression Western blotting, Affinity purification, Proteomics expression Proteomic	02/09	Analyzia of cono		
03/15Analysis of protein expressionWestern blotting, Affinity purification, Proteomics03/22Metabolic labeling and protein labeling李天能 吳茂瑄03/29Growth and differentiationControl of growth speed, measure cell viability, stem cell culture and differentiation陳粲然 曾琳蘆04/05Suspended (Lily abroad)04/12Cell cycleFlow cytometry, synchronization, sorting高敏雄 廖宏鈞04/19ImmunostainingImmunohistochemical and immunofluorescence staining洪敏倫 陳品媛04/26Cell behaviorMigration, invasion, attachment, particle tracking辜昱嘉 王依婷05/03MicroscopyMicroscope, objects, device setting, light path, and camera謝季恩 翁琬婷05/10Live cellTime-lapse setting, 3D and 4D楊奕	03/08	-		
protein expression  O3/22 Metabolic labeling and protein modification  O3/29 Growth and differentiation  O4/05 Suspended (Lily abroad)  O4/12 Cell cycle Flow cytometry, synchronization, sorting  O4/19 Immunostaining Immunohistochemical and immunofluorescence staining  O4/26 Cell behavior Migration, invasion, attachment, particle tracking  O5/03 Microscopy Microscope, objects, device setting, light path, and camera  O3/29 Metabolic Metabolic labeling and protein   \$\particle{\pi}\$ \particle{\pi}\$ \particl	03/15			
expression	03/13			
Metabolic labeling and protein modification   李天能 吳茂瑄		1	parmean, recommes	
Babeling   modification   吳苡瑄	03/22		Metabolic labeling and protein	李天能
Growth and differentiation		labeling		
differentiation cell viability, stem cell culture and differentiation	03/29	Growth and	Control of growth speed, measure	
differentiation		differentiation		
04/12Cell cycleFlow cytometry, synchronization, sorting高敏雄 廖法鈞04/19ImmunostainingImmunohistochemical and immunofluorescence staining洪敏倫 陳品媛04/26Cell behaviorMigration, invasion, attachment, particle tracking辜昱嘉 王依婷05/03MicroscopyMicroscope, objects, device setting, light path, and camera謝季恩 翁琬婷05/10Live cellTime-lapse setting, 3D and 4D楊奕			differentiation	, 117, <u>1111</u>
sorting 廖汯鈞  04/19 Immunostaining Immunohistochemical and immunofluorescence staining 陳品媛  04/26 Cell behavior Migration, invasion, attachment, particle tracking 王依婷  05/03 Microscopy Microscope, objects, device setting, light path, and camera 翁琬婷  05/10 Live cell Time-lapse setting, 3D and 4D 楊奕	04/05	Suspended (Lily al	broad)	1
04/19ImmunostainingImmunohistochemical and immunofluorescence staining洪敏倫 陳品媛04/26Cell behaviorMigration, invasion, attachment, particle tracking辜昱嘉 王依婷05/03MicroscopyMicroscope, objects, device setting, light path, and camera謝季恩 翁琬婷05/10Live cellTime-lapse setting, 3D and 4D楊奕	04/12	Cell cycle	Flow cytometry, synchronization,	高敏雄
immunofluorescence staining 陳品媛  04/26 Cell behavior Migration, invasion, attachment, particle tracking 王依婷  05/03 Microscopy Microscope, objects, device setting, light path, and camera 翁琬婷  05/10 Live cell Time-lapse setting, 3D and 4D 楊奕			sorting	廖浤鈞
04/26Cell behaviorMigration, invasion, attachment, particle tracking辜昱嘉 王依婷05/03MicroscopyMicroscope, objects, device setting, light path, and camera謝季恩 翁琬婷05/10Live cellTime-lapse setting, 3D and 4D楊奕	04/19	Immunostaining	Immunohistochemical and	洪敏倫
particle tracking 王依婷  05/03 Microscopy Microscope, objects, device setting, light path, and camera 翁琬婷  05/10 Live cell Time-lapse setting, 3D and 4D 楊奕			immunofluorescence staining	陳品媛
05/03MicroscopyMicroscope, objects, device setting, light path, and camera謝季恩 翁琬婷05/10Live cellTime-lapse setting, 3D and 4D楊奕	04/26	Cell behavior	Migration, invasion, attachment,	辜昱嘉
light path, and camera 翁琬婷  05/10 Live cell Time-lapse setting, 3D and 4D 楊奕			particle tracking	王依婷
05/10 Live cell Time-lapse setting, 3D and 4D 楊奕	05/03	Microscopy	Microscope, objects, device setting,	謝季恩
05/10 Live cell Time-lapse setting, 3D and 4D 楊奕			light path, and camera	翁琬婷
	05/10	Live cell	Time-lapse setting, 3D and 4D	
1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		imaging I	1 0	
05/17 Live cell FRET, FLIM, FRAP, Quantum dots 薛諱陽	05/17	Live cell	FRET, FLIM, FRAP, Quantum dots	
imaging II		imaging II		
05/24 High speed and Spinning disk, light sheet, label-free 陳筱茜	05/24	High speed and	Spinning disk, light sheet, label-free	
content technology 林庭妤		<b>U</b> 1	1 2 , 2	
05/31 Super resolution SIM, STED, STROM, PALM, and 蔡居霖	05/31	Super resolution	SIM, STED, STROM, PALM, and	
SOFI 李紹郁		·F		
06/07 Final report Final sum-up	06/07	Final report	Final sum-un	4 1417