

課程名稱：BMES525400 幹細胞與組織工程

學分數：3

時間：Thursday 2, 3, 4

地點：醫環系 R517

授課老師：張建文 (C.W. Chang)

助教： TBD

學習目標：本課程的教學目標在於使修課同學能對當代組織工程發展取得深入的認識，因此在課程內容將涵蓋三大部分，包括：(1) 幹細胞生物學入門；(2) 新穎組織工程材料與技術（高分子支架、奈米基因治療、3D 生物列印、細胞治療）；(3) 幹細胞、組織工程應用實例。

**Goal:** Three main parts will be covered in this course, including: (1) Introduction of stem cell biology ; (2) Biomaterials & technologies for tissue engineering ; (3) Medical applications of stem cells and tissue engineering.

課程內容:

L1 Introduction

L2 Biology background for tissue engineering I (Cell biology)

L3 Biology background for tissue engineering II (ECM)/Tissue culture

L4 Stem cells I: embryonic stem cells

L5 Stem cells II: iPSCs & adult stem cells

L6 Biomaterials I: Stem Cells & Biomaterials introduction/ Journal paper discussion 1

L7 Biomaterials II: Surface engineering of biomaterials, polymeric biomaterials/ Journal paper discussion 2

L8 Biomaterials III: Tissue engineering scaffold/ Journal paper discussion 3

L9 Gene therapy / Journal paper discussion 4

L10 3D Bioprinting on tissue engineering/ Journal paper discussion 5

### Midterm Exam

L11 TE (Tissue Engineering) on cardiovascular system / Journal paper discussion 6

L12 TE on musculoskeletal system I / Journal paper discussion 7

L13 TE on skin /Journal paper discussion 8

上課參考資料:

1. Principle of Tissue Engineering, 3<sup>rd</sup> edition Edited by Robert Lanza, Robert Langer and Joseph Vacanti, Academic Press. (The electronic copy is available from NTHU library)
2. Tissue Engineering, Bernhard ø. Palsson and Sangeeta N. Bhatia.
3. Journal papers

評分標準

上課參與 20%

書面報告 40%

期中考 40%