

课程大纲

COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	骨骼组织工程/Bone Tissue Engineering																						
2.	课程性质 Compulsory/Elective	Elective																						
3.	课程学分/学时 Course Credit/Hours	3 学分/48 学时 3 credits/48 hours																						
4.	授课语言 Teaching Language	英语/English																						
5.	授课教师 Instructor(s)	刘超/Chao Liu																						
6.	先修要求 Pre-requisites	无/Not applicable																						
7.	教学目标 Course Objectives	<p>This course discusses bone tissue engineering from the current clinical standards to the most recent developments. Bone tissue engineering strategies will be introduced from biochemical and biomechanical roles of the major cell types found the bone: osteoblasts, osteoclasts, vascular endothelial cells and their respective progenitors. In addition, tissues that are associated with the bone will be introduced.</p> <p>The students will learn about the latest advances in the field of bone tissue engineering. The students will also become proficient at interpreting data common in bone tissue engineering such as MicroCT, histology, immunohistochemistry, and immunofluorescent microscopy.</p>																						
8.	教学方法 Teaching Methods	<p>Teaching material will be gathered from text books and scientific journal articles.</p> <p>Group discussions will be used to critically analyze scientific results and engineering designs.</p> <p>Each student will complete a written report of a related topic, and give a presentation to the class.</p>																						
9.	教学内容 Course Contents	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Section 1</td> <td>Bone developmental biology</td> </tr> <tr> <td style="text-align: center;">Section 2</td> <td>Bone cell biology: MSC, osteoblasts, osteocytes, osteoclasts</td> </tr> <tr> <td style="text-align: center;">Section 3</td> <td>The organic and inorganic matrices</td> </tr> <tr> <td style="text-align: center;">Section 4</td> <td>Signaling molecules</td> </tr> <tr> <td style="text-align: center;">Section 5</td> <td>Polymers in bone tissue engineering</td> </tr> <tr> <td style="text-align: center;">Section 6</td> <td>Bone scaffold design</td> </tr> <tr> <td style="text-align: center;">Section 7</td> <td>Animal models</td> </tr> <tr> <td style="text-align: center;">Section 8</td> <td>Biomechanics</td> </tr> <tr> <td style="text-align: center;">Section 9</td> <td>Clinical applications – cranial facial and dental</td> </tr> <tr> <td style="text-align: center;">Section 10</td> <td>Clinical applications – spine and orthopedics</td> </tr> <tr> <td style="text-align: center;">.....</td> <td></td> </tr> </table>	Section 1	Bone developmental biology	Section 2	Bone cell biology: MSC, osteoblasts, osteocytes, osteoclasts	Section 3	The organic and inorganic matrices	Section 4	Signaling molecules	Section 5	Polymers in bone tissue engineering	Section 6	Bone scaffold design	Section 7	Animal models	Section 8	Biomechanics	Section 9	Clinical applications – cranial facial and dental	Section 10	Clinical applications – spine and orthopedics	
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10.	课程考核 Course Assessment
	Participation 10% Assignments 20% Report 40% Presentation 30%
11.	教材及其它参考资料 Textbook and Supplementary Readings
	Hollinger, J. O., Einhorn, T. A., Doll, B., & Sfeir, C. (Eds.). (2004). Bone tissue engineering. CRC press. Cowin, S. C. (2001). Bone mechanics handbook. CRC press.