Exam MOL3015
Nanomedicine II - Therapy

Friday May 21th 2012, 9.00 - 13.00

ECTS credits: 7.5
Number of pages (included front-page): 2
Aids: C – Dictionaries/word books allowed
Language: English or Norwegian

Contact person during the exam:
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Exam results: June 13th
Examination results are announced on http://studweb.ntnu.no/
Please do not exceed indicated lengths, illustrations do not count, letter size will be considered. Weight of questions is listed. Good luck.

1) Tissue engineering (20pts)
a) Briefly describe how extracellular matrix (ECM) is organized and why it would be beneficial to recreate ECM in respect to tissue engineering? (10pts, 1page)
b) Describe three different techniques available for generating porous networks for tissue scaffold? (10pts, 1page)

2) Drug delivery (35pts)
a) For what reasons do we need drug delivery systems? (5pts, ½ page)
b) What are the cellular mechanisms responsible for uptake of micro/nanoparticles by cells? (20pts, 2pages)
c) What are the reasons for introducing polyethylene glycol (PEG) on the surface of drug delivery systems? (5pts, 1/2 page)
d) Receptor-mediated cancer targeting has failed miserably in clinical settings. Why is cancer targeting so difficult? (5pts, 1/2pages)

3) Nanotoxicology (20pts)
a) What are the three hallmark processes of cellular toxicity? (5pts, 1/2page)
b) Phagocytic cells can eat substrates bigger than themselves. What are the biochemical/cell biological consequences of non-degradable particles in tissues? (15pts, 2pages)

The semester paper is 25pts=100total.

Thank you.