

UNIVERSITETET I OSLO

DET MATEMATISK-NATURVITENSKAPELIGE FAKULTET

Exam in MBV 4320 / 9320 - Advanced Physiology and Cell biology

Day: Friday 25 February 2011

Time for exam: 09.00 – 12.00

The exam includes one page

Allowed aids: none

Number of questions: 7 (Only 6 should be answered, see below)

Please answer each of the questions on separate sheets of paper

Check that the set of questions is complete before you start

A PHYSIOLOGY

Please try to answer all four physiology questions

- 1) Describe one possible signaling pathway connecting muscle activity and muscle phenotype
- 2) How do we know that the placebo effect is dependent of the opioid receptor system? On which structures in the brain does expectancy of reduced pain have an effect?
- 3) What is good and bad about hypoxic pulmonary vasoconstriction (HPV), and describe one possible mechanism mediating the HPV response.
- 4) What physiological problems can we expect that coral reef fishes will encounter in a near (50 – 100 years) future.

B CELLBIOLOGY

Here you should ONLY answer two (2) out of three (3) cellbiology questions

- 5) An un-charged molecule is distributed across a cell membrane and the electrochemical potential difference is zero for this molecule. Volume-sensitive channels for the molecule is activated and the permeability is drastically increased. What effect on the distribution of the molecule across the cell membrane would this increased permeability have?
- 6) How are aquaporins involved in regulation of urine formation?
- 7) Autophagy is now considered an important process for the delivery of antigens to MHCII molecules. Describe three possible ways cytosolic antigens get access to the MHC class II compartments.