



Schedule TUMOR BIOLOGY 15 hp

- Course time: **November 2, 2021 – January 15, 2022**
- Course code: 5MO102/3MB034
- Lecture hall: The lectures and discussions are either in **lecture room Thymine + Uracil (T+U)** (room 6K-148) at the Department of Molecular Biology, in the **Astrid Fagreus lecture hall (A F)** (room 6A-103) or by Zoom meeting. Please note that additional lectures may change to Zoom with short notice due to covid-19 restrictions or other reasons.
- Laboratories: Laboratory experiments are in the **Green Lab + Green Annex**. The time schedule for the laboratory experiments is approximate, because of many variables (planning, skills, speed, etc.)
- Requirements: 1) Content of textbook **"The Biology of Cancer" 2nd edition** by Robert A. Weinberg (2013) Publisher: Garland Science. ISBN 9780815342205 (softcover) and lectures.
2) Laboratory experiments emanating in reports in the form of a synopsis (Laboratory experiment 1) and a scientific paper (Laboratory experiment 2)
- Examination: **Written Test**, 13.00-17.00 December 1, 2021 in Östra Paviljongen.
Laboratory experiment reports
- Course leaders: Jenny Persson (JP) jenny.persson@umu.se tel. 0706-391199
- Assitant Course Leader: Thomas Grundström (TG) thomas.grundstrom@umu.se tel. 785 2531, 072-7055603
tel. 785
- Administrator: Ingela Nilsson/Lina Helgesson studieadm.molbiol@umu.se
- Assistents: Martuza Sarwar martuza.sarwar@umu.se tel. 070-625 21 31
Tianyan Wang tianyan.wang@umu.se
- Lecturers: Sofie Degerman (SD) sofie.degerman@umu.se
Thomas Grundström (TG) thomas.grundstrom@umu.se
Jenny Persson (JP) jenny.persson@umu.se
Daniel Öhlund (DÖ) daniel.ohlund@umu.se
- Duty to attend: All laboratory experiments, discussion of Tumor Biology problems and the written test. In case of illness, report to **Martuza Sarwar** concerning **laboratory experiments** or the course leader concerning **discussions of Tumor Biology problems** as soon as possible, preferably by e-mail.

WEEK 44

- Tues 2/11** 9.00 – 9.45 T+U **Registration, course information and study technique (JP)**
12.00– 14.45 T+U **L1-Genetics.** Chap. 1 (JP).
- Wed 3/11** 9.00 – 12.00 T+U **L2-Nature of Cancer/Histopathology** Chap. 2 (JP)
- Thurs 4/11** 9.00 – 12.00 T+U **L3-Tumor Viruses** Chap. 3 (TG)
- Friday 5/11** 9.00 – 12.00 T+U **Discussion of Tumor Biology problems (MS)**

WEEK 45

- Mon 8/11** 9.00 – 12.00 T+U **L4- Cellular Oncogenes** Chap. 4 (DÖ)
- Tues 9/11** 9.00 – 12.00 T+U (ev.Zoom) **L5- Growth Factors, Receptors.** Chap. 5 (TG)
- Wed 10/11** 9.00 – 12.00 T+U (ev.Zoom) **L6- Cytoplasmic signaling.** Chap. 6 (TG)
- Thurs 11/11** 9.00 – 10.30 T+U **Introduction to Laboratory section of Tumor Biology and to Laboration 1 (MS/TW)** A separate more detailed laboratory section schedule will be given
12.00. –15. 00 T+U (ev.Zoom) **L7- Tumor Suppressor Genes.** Chap.7 (TG)
- Fri 12/11** 9.00 – 12.00 T+U **L8- p53 and apoptosis.** Chap. 9 (DÖ)
13.00 – 16.00 T+U **L9- pRb and the Cell Cycle.** Chap. 8 (JP)

WEEK 46

- Mon 15/11** 9.00 – 14.00 **Laboration 1 (MS/TW)** Seeding and treating cells for apoptosis
14:30- 15:30 T+U **Discussion about lab. 1-how to present the data. (JP/MS/TW)**
- Tues 16/11** 13.00 – 16.30 T+U **Discussion of Tumor Biology problems (MS)**
- Wed 17/11** 8.00 – 15.00 **Laboration 1 (MS/TW)** Stain cells and Flow Cytometry
- Thurs 18/11** 9.00 – 12.00 T+U **L11-Multistep Tumorigenesis.** Chap. 11 (JP)
- Fri 19/11** 9.00 – 12.00 T+U **L10-Cell immortalization.** Chap. 10 (SD)

WEEK 47

Mo 22/11

Tues 23/11 9.00 – 12.00 T+U **L12-Genomic Integrity.** Chap. 12 (JP)

Wed 24/11 09.00 – 12.00 AF **L13 Stroma, Invasion and Metastasis.** Chap. 13 and 14(JP)
13.00-16.00 **UmUPlay L15- Tumor Immunology and rational Treatment.** Chap. 15 and 16 (TG)

Thurs 25/11 09.00 – 12.30 **UmU Play L16- Continuation of Tumor Immunology and rational Treatment.** Chap. 15 and 16.
13:30-16:00 **Zoom Summery for Examination, Time for questions on the theory part of the course.** (JP)

Fri 26/11 **Study for Written Test.**

WEEK 48

Mo 29/11 **Study for Written Test.**

Tu 30/11 **Study for Written Test.**

Wed 1/12 **WRITTEN TEST/EXAM in Östra Paviljongen.**

Thurs 2/12 08.30 – 09.30 (U+T) **Introduction to Laboration 2 (MS/TW).**
09.30 – 14:00 **Laboration 2** Seed cells for transfection and treatment

Fr 3/12 08.30 – 12:00 **Laboration 2** Transfect cells and treat cells

WEEK 49

Mon 6/12 09.00 – 15.30 **Laboration 2: Protein Lysate collection (MS/TW) and Discussion about problem based learning (PBL) for the lab**
Tue 7/12 08.30 – 16.00 **Laboration 2: Seeding and treatment of cells for Proliferation Assay and Cell Cycle Analysis (MS/TW)**

Wed 8/12 09.00 – 12.30 **Laboration 2** Whole cell Lysate Preparation and Training of Concentration Merasurement & Proliferation Data analysis
13.30 – 15.30 **Laboration 2** Whole cell Lysate Preparation and Training of Concentration Merasurement & Proliferation Data analysis

Thurs 9/12 09.00 – 15:30 **Laboration 2: Fix cells for Cell Cycle analysis and add MTS for Proliferation analysis (MS/TW)**

Fr 10/12 09.00 – 15.30 **Laboration 2: Stain cells for Cell Cycle and analysis with Flow cytometer (MS/TW), Training on the Example Cell Cycle Data (MS/TW)**

WEEK 50

Mo 13/12	09.00 – 17.00	Laboration 2 Western Blotting (MS/TW)
Tu 14/12	09.00 – 17.00	Laboration 2: Western Blotting Continued (MS/TW), Training on the Image J software for Western Blotting
We 15/12	09.00 – 15:30	Laboration 2: Western Blotting
Th 16/12	09.00 – 12.00 13:00- 14:30	Lab Laboration 2 Immunofluorescence Microscopy (U+T) Discussion/training of Data for Lab 2 (MS/TW)
Fr 17/12	09.00 – 13.30	Laboration 2 (If needed) (MS/TW) Writing of reports.

WEEK 52

Writing of reports.

WEEK 53

Writing of reports.

WEEK 1

Writing of reports.

WEEK 2

Mo 10/1	9.00-17.00 (U+T)	Lab seminars. Presentation of reports on laboration and discussion of the reports and the presentations. Course evaluation.
Tu 11/1		Time to correct/improve reports
We 12/1		Time to correct/improve reports
Th 13/1		Time to correct/improve reports
Fr 14/1	17.00	Time to correct/improve reports Deadline. Lab report due (emailed) individually. Send by email. File format-word (doc/docx)
Sa 15/1	xx.00 – xx.00	WRITTEN RE-EXAMINATION Room: .