

Course program MBV4010 - 2017

Weeks 35 and 36

The course will start with an introductory lecture (Pål Falnes) at 9.15 on Monday 28 August in room 3213 in the Kristine Bonnevie building. Thereafter (at 10.00) , you will be divided in two groups, and start working on either of the two lab projects “Cloning and mutagenesis” (Group 1) or “RT-PCR and subcellular localization” (Group 2). In week 36, the two groups will swap projects, so that all students will do both projects. The approximate timetables for these projects are found below.

Important: There will be a lecture by Nobel laureate Shinya Yamanaka at UiO 10:00 - 11:30 on Sept. 6th. To enable your attendance to this lecture, there will be a break in the course program on that day (and you may finish a little later than usual). You are all encouraged to sign up for this lecture at:

<http://www.uio.no/english/research/strategic-research-areas/life-science/news-and-events/events/2017/nobel-event-stem-cells.html>

Cloning and mutagenesis – time table

Laboratory work in lab 2117.

Lecture and presentation of results in room 3213.

Start: Monday 28 Aug. (Group 1) or Monday 4 Sept. (Group 2) at 10.00 in room 3213.

	Monday	Tuesday	Wednesday	Thursday	Friday
9.15-10.00	Introductory lecture (week 35 only!)	Deletion mutant Purification of PCR-product Gel analysis	Point mutant Inspect plates	Deletion mutant Inspect plates	Deletion mutant Miniprep Restriction cutting Gel analysis
10.00-10.45	Presentation lab course	Point mutant Gel analysis Dpn1 treatment	Deletion mutant Run gel Purification from gel Set up ligation reaction	Point mutant Miniprep Restriction cutting	
11.00-12.00	Preparation lab course				
12.00-13.00*	Lunch	Lunch	Lunch	Lunch	Lunch
13.00-16.00*	Point mutant Set up PCR reaction. Deletion mutant Set up PCR reaction. <i>Lab journal writing</i>	Deletion mutant Restr. cutting Point mutant Transformation <i>Lab journal writing</i>	Point mutant Set up cultures for miniprep Deletion mutant Transformation <i>Lab journal writing</i>	Point mutant Gel analysis Deletion mutant Set up cultures for miniprep <i>Lab journal writing</i>	Presentation of the results (room 3213)

*Subject to variation

RT-PCR and subcellular localization – time table

Lab work and lectures (L).

Start: Monday 28 Aug. (Group 2) or Monday 4 Sept. (Group 1) at 10.00 in lab 2418.

	Monday	Tuesday	Wednesday	Thursday	Friday
9.15 10.00	Introductory Lecture (L) (week 35 only!) Sub cellular localization Recombination	RT- PCR (L) mRNA isolation Isolation of RNA	RT- PCR Check PCR-products on gel	Sub cellular localization Microscopy of infiltrated tobacco leaves	RT- PCR Miniprep of ON culture
11.00	(L) Overview of the lab and lab journal Gateway cloning	Isolation of RNA	(L) Topo cloning Miniprep	RT-PCR Set up Q-PCR reactions	Restriction enzyme digestion
	(L) Methods for stable and transient transformation of plants	RT- PCR Reverse transcriptase reaction	RT- PCR TOPO cloning and transformation		Electrophoresis, agarose gel analysis
12.00-12.30	Lunch	Lunch	Lunch	Lunch	Lunch
12.30	Lecture (L) on the chromatin remodelling SET proteins Room 3213	RT- PCR Setting up PCR reactions	Sub cellular localization Miniprep of transformants	Sub cellular localization Microscopy of infiltrated tobacco leaves	RT- PCR Measure DNA concentration and prepare for sequencing
13.30	Sub cellular localization Infiltration of <i>Nicotiana benthamiana</i> (tobacco) plants		Sub cellular localization Run minipreps on gel		
	Sub cellular localization Transformation	Sub cellular localization Pick colonies and make over night cultures.		RT-PCR Pick colonies and make over night cultures	Presentation of results
	<i>Journal writing</i>	<i>Journal writing</i>	<i>Journal writing</i>	<i>Journal writing</i>	<i>Journal writing</i>

Week 37 (All lectures will be held in room 3213, if not indicated otherwise).

Monday 11 September

9.15 - 11.00. Lectures: "DNA-modifying enzymes and their use in gene technology" (Pål Falnes)

11.15 -12.00. Lecture: "Polymerase chain reaction (PCR)" (Pål Falnes)

Tuesday 12 September

9.15 - 10.00. Lecture: "DNA cloning" (Pål Falnes)

10.15 -12.00. Lecture: "The budding yeast *S. cerevisiae* as a model organism" (Sandra Lopez, BioTek/UiO)

13.15 - 14.00. Lecture: "DNA sequencing" (Pål Falnes)

Wednesday 13 September

9.15 -11.00. Lecture: "High-throughput genomic analysis, technologies and applications" (Leonardo A. Meza-Zepeda, OUS)

12.15 - 14.00. Lectures: "Introduction to bioinformatics" (Torbjørn Rognes, UiO/OUS)

Thursday 14 September

9.15 - 12.00. (PC-room 3205) Bioinformatics exercises: Retrieving DNA and protein sequences from databases, sequence alignments, BLAST searches (Torbjørn Rognes and Pål Falnes).

Friday 15 September

9.15 - 11.30 (PC-room 3205) Bioinformatics exercises, continued: Iterative BLAST searches, sequence phylogeny, comparison of different alignment methods, genomic BLAST searches (Torbjørn Rognes and Pål Falnes).

12.00 - 16.00. "Design of cloning primers" (Pål Falnes)

12.00 - 12.30. Introductory lecture

12.30 - 16.00. (PC-room 3205) Computer exercises

Week 38 (All lectures will be held in room 3213, if not indicated otherwise).

Monday 18 September

9.15 - 16.00. (PC-room 3205) Introduction to, and practical exercises in the plasmid design program Vector NTI (Paul Grini, Katrine Bjerkan and Karina Hornslien)

Tuesday 19 September

9.15 - 16.00. (PC-room 3205) Introduction to, and practical exercises in the plasmid design program Vector NTI, continued (Paul Grini, Katrine Bjerkan and Karina Hornslien).

Wednesday 20 September

9.15 -10.00. Lecture: “*C. elegans* as a model organism” (Hilde Nilsen, Ahus/UiO)

10.15 -11.00. Lecture: “Genome editing with designer nucleases” (Beata Nadratowska-Wesolowska)

11.15 - 12.00. Lecture: “Transgenic mice; construction and applications” (Arne Klungland, UiO/OUS)

13.15 - 14.00. Lecture: “Mutagenesis as a tool in biological research” (Pål Falnes)

Thursday 21 September

9.15 - 10.00. Lecture: “RNA Interference and Innate Immunity” (Mouldy Sioud, OUS)

10.15 -11.00. Lecture: "Phage display technology: applications in biology and medicine" (Mouldy Sioud, OUS)

11.15 - 12.00. Lecture: “DNA based methods for investigating chromatin organization” (Odd Stokke Gabrielsen)

12.30– 16.00. “Analysis of transcription levels by real-time PCR” (Reidunn Aalen)

12.30 - 13.15. Introductory lecture

13.30 - 16.00. (PC-room 3205) Computer exercises

Friday 22 September

9.15 - 11.00. Lecture : “Gene transfer to plants - vectors and strategies” (Reidunn Aalen)

11.15 -12.00. ”Expression of recombinant proteins in *E. coli*” (Pål Falnes)

12.00 - 12.15. "MBV4010 - Concluding remarks and questions". (Pål Falnes)

Week 39

Friday 29 September

9.00 - 12.00 Exam in Sal 3B, Silurveien 2 (NB! This is off-campus!)