Course program – MBV4010

Week 34 :
Introduction to laboratory and field safety. MNLAB0020 in auditorium 2 Chemistry building.

Weeks 35 and 36
The course will start with an introductory lecture (Pål Falnes) at 9.15 on Monday 29 August in room 3213 in the Kristine Bonnevie building. Thereafter (at 10.00), you will 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 all students will do both projects.
The timetables for these projects are found below.

<u>Cloning and mutagenesis – time table</u>
Laboratory work in lab 2117.
Lecture and presentation of results in room 3213.
Start: Monday 29. Aug. (Group 1) or Monday 5. 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** Gel analysis Dpn1 treatment	**Point mutant** Inspect plates **Deletion mutant** Run gel Purification from gel Set up ligation reaction	**Deletion mutant** Inspect plates **Point mutant** Miniprep Restriction cutting	**Deletion mutant** Miniprep Restriction cutting Gel analysis
10.00-10.45	Presentation lab course				
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. ***Lab journal writing***	**Deletion mutant** Restr. cutting **Point mutant** Transformation ***Lab journal writing***	**Point mutant** Set up cultures for miniprep **Deletion mutant** Transformation ***Lab journal writing***	**Point mutant** Gel analysis **Deletion mutant** Set up cultures for miniprep ***Lab journal writing***	**Presentation of the results** (room 3213)

*Subject to variation

RT-PCR and subcellular localization – time table

Lab work and lectures (L).

Start: Monday 29 Aug (Group 2) or Monday 5 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		Restriction enzyme digestion
	(L) Methods for stable and transient transformation of plants	**RT- PCR** Reverse transcriptase reaction	**RT- PCR** TOPO cloning and transformation		Electro-phoresis, 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 *Nicotiana benthamiana* (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**
	Journal writing	***Journal writing***	***Journal writing***	***Journal writing***	***Journal writing***

*** All lab days will start with a short presentation of the practical lab work.**

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

Monday 12 September
9.15 - 11.00. Lectures: "DNA-modifying enzymes and their use in gene technology" (Pål Falnes)

12.15 - 15.00. Information databases and information management - how to work efficiently with scientific literature. Introduction to reference software (EndNote)
12.15 – 13.00. Lecture (Kirsten Borse Haraldsen, room 3213)
13.15 -15.00. Practical exercises in PC lab (Group 1 in PC-room 1413 and group 2 in PC-room 4129) (Kirsten Borse Haraldsen and Heidi Sjursen Konestabo)

Tuesday 13 September
9.15 - 10.00. Lecture: "DNA cloning" (Pål Falnes)

10.15 -11.00. Lecture: "Polymerase chain reaction (PCR)" (Pål Falnes)

12.15 - 15.00. Scientific writing and communication - citing relevant literature and using reference software (EndNote)
12.15 – 13.00. Lecture (Kirsten Borse Haraldsen and Heidi Sjursen Konestabo, room 3213)
13.15 -15.00. Practical exercises in PC lab (Group 1 in PC-room 1413 and group 2 in PC-room 4129) (Kirsten Borse Haraldsen and Heidi Sjursen Konestabo)

Wednesday 14 September
9.15 – 10.00. Lecture: "Expression of recombinant proteins in *E. coli*" (Pål Falnes)

10.15 – 11.00. Lecture: "Mutagenesis as a tool in biological research" (Pål Falnes)

12.15 - 13.00. Lecture: "*C. elegans* as a model organism" (Hilde Nilsen)

Thursday 15 September
9.15 - 1l.00. Lectures: "Introduction to bioinformatics" (Torbjørn Rognes)

12.15 - 16.00. (PC-room 1413) Bioinformatics exercises: Retrieving DNA and protein sequences from databases, sequence alignments, BLAST searches (Torbjørn Rognes and Pål Falnes).

Friday 16 September
9.15 -10.00. Lecture: "Transgenic mice; construction and applications" (Arne Klungland)

10.15 - 11.00. Lecture: "Application of zinc finger nucleases in gene targeting" (Stefan Kernstock)

12.15 - 15.00. (PC-room 1413) Bioinformatics exercises, continued: Iterative BLAST searches, sequence phylogeny, comparison of different alignment methods, genomic BLAST searches (Torbjørn Rognes and Pål Falnes)

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

Monday 19 September
9.15 - 16.00. (PC-room 1413) Introduction to, and practical exercises in the plasmid design program Vector NTI (Paul Grini and Pål Falnes)

Tuesday 20 September
9.15 - 16.00. (PC-room 1413) Introduction to, and practical exercises in the plasmid design program Vector NTI, continued. (Paul Grini and Pål Falnes)

Wednesday 21 September
9.15 - 10.00. Lecture: "DNA sequencing" (Pål Falnes)

10.15 -11.00. Lecture: ”High-throughput DNA-sequencing in cancer research” (Leonardo A. Meza-Zepeda)

11.15-12.00. Lecture: ”Microarray technology and applications” (Leonardo A. Meza-Zepeda)

13.15 -14.00. Lecture: " DNA based methods for investigating chromatin organisation" (Ragnhild Eskeland)

Thursday 22 September
9.15-11.00. Lecture **:** “RNA silencing pathways, principles, mechanisms and applications” (Kriton Kalantidis)

11.15 - 16.00. "Design of cloning primers and Zn-finger nucleases" (Pål Falnes)
11.15-12.00. Introductory lecture
13.15-16.00. (PC-room 1413) PC-exercises

Friday 23 September
9.15-11.00. Lecture **:** “Transgenic plants, methodology and applications” (Kriton Kalantidis)

12.15 – 15.00 : "Analysis of transcription levels by real-time PCR" (Reidunn Aalen)
12.15-13.00. Introductory lecture
13.15-15.00. (PC-room 1413) PC-exercises

Week 39
Friday 30 September
9.00-12.00 Exam