

MBV4010 - Course program – autumn 2013

Week 34: Safety course. Introductory day (Friday Aug. 23rd) to scientific part of the course and to IBV's master program in molecular biosciences.

IBV Master Program in molecular biosciences

Introductory day – Friday Aug. 23, 2013
(Auditorium 1, KB-hus)

Program

- 9:15 – 9:30 **Finn-Eirik Johansen** (Head of department, IBV)
“Introduction to IBV and its master programs”
- 9:30 – 10:00 **Odd Stokke Gabrielsen** (IBV and MLS^{UiO})
“Molecular Life Science (MLS) at the University of Oslo”
- 10:00 – 10:15 Break
- 10:15 – 10:25 **Espen Kallevik** (The UoO Career Center): *“How to Make a Good Transition from Education to Work”*
- 10:25 – 10:55 **Anders Holm** (Inven2):
“Commercialization of discoveries within molecular biosciences”
- 10:55 – 11:15 Break
- 11:15 – 12:00 **Pål Falnes** (IBV)
“Introduction to MBV4010 “Methods in Molecular Biology and Biochemistry I””
- 12.00 – 12.15 **Toril Rørtveit** (IBV)
“Choosing a master thesis project at IBV”
- 12:15 – 13:00 Lunch

Weeks 35 and 36

In week 35 you will work 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.

Cloning and mutagenesis – time table

Laboratory work in lab 2117.

Lecture and presentation of results in room 3213.

Start: Monday 26. Aug. (Group 1) or Monday 2. Sept. (Group 2) at 9.15 in room 3213.

	Monday	Tuesday	Wednesday	Thursday	Friday
9.15-10.00	Introductory lecture	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	Deletion mutant Run gel Purification from gel	Point mutant Miniprep Restriction cutting	
11.00-12.00	Preparation lab course	Dpn1 treatment	Set up ligation reaction		
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 26 Aug (Group 2) or Monday 2 Sept. (Group 1) at 9.15 in lab 2418

	Monday	Tuesday	Wednesday	Thursday	Friday
9.15	Sub cellular localization Recombination	RT- PCR (L) cDNA synthesis 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) New cloning methods	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 <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 9 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)

13.15 - 15.00. Practical exercises in PC lab (Group 1 in PC-room 1413 and group 2 in PC-room 1250) (Kirsten Borse Haraldsen and Heidi Sjursen Konestabo, University Library)

Tuesday 10 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)

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 11 September

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

10.15 -11.00. Lecture: "Next Generation Sequencing – Technology and Applications in Cancer Research" (Leonardo A. Meza-Zepeda, OUS)

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

Thursday 12 September

9.15 - 11.00. Lectures: "Introduction to bioinformatics" (Torbjørn Rognes, UiO/OUS)

12.15 - 16.00. (PC-room 1250) Bioinformatics exercises: Retrieving DNA and protein sequences from databases, sequence alignments, BLAST searches (Torbjørn Rognes and Pål Falnes).

Friday 13 September

9.15 - 10.00. Lecture: "RNAi – a useful tool for functional genomics studies" (Mohammed Amarzguioui, Inven2)

10.15 - 11.00. Lecture: "DNA based methods for investigating chromatin organization" (Ragnhild Eskeland)

12.15 - 15.00. (PC-room 1250) 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 16 September

9.15 - 16.00. (PC-room 1250) Introduction to, and practical exercises in the plasmid design program Vector NTI (Paul Grini)

Tuesday 17 September

9.15 - 16.00. (PC-room 1250) Introduction to, and practical exercises in the plasmid design program Vector NTI, continued. (Paul Grini)

Wednesday 18 September

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

10.15 - 11.00. Lecture: “Mutagenesis as a tool in biological research” (Pål Falnes)

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

Thursday 19 September

9.15 - 10.00. Lecture: “Transgenic mice; construction and applications” (Arne Klungland, UiO/OUS)

10.15 -11.00. Lecture: “Genome editing with designer nucleases” (Ragnhild Eskeland)

11.15 - 16.00. “Design of cloning primers” (Pål Falnes)

11.15 - 11.45. Introductory lecture

12.15 - 16.00. (PC-room 1250) Computer exercises

Friday 20 September

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

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 1250) Computer exercises

Week 39

Friday 27 September

9.00 - 12.00 Exam