

## **Week 34**

### Monday 17 August

9.15 (room 3213) Registration, information, organisation

10.30 (room 3213) Lecture: "Tillaging av løsninger" ("Preparing solutions") (Hilde Letnes)

Laboratory work starting at 12.00:

Pouring agar plates

Preparing LB medium

Initiating the preparation of competent cells: Inoculating an overnight culture

Preparation of solutions

Autoclaving (wet).

### Tuesday 18 August

09.00 Preparation of competent cells: Initiating the bacterial culture

09.15-10.00 (room 3213) Lecture: "Sikkerhet i laboratoriet" ("Safety in the laboratory") (Solveig Hauge Engebretsen)

10.30-12.30 Laboratory work

12.30-13.30 Lecture and demonstration: "Strålevern" (Radiation safety) (Solveig Hauge Engebretsen)

Calibration of pipettes (Ruby Manikam)

From 13.30: Laboratory work: Preparation of competent cells

15.00-16.00 Calibration of pipettes (Ruby Manikam)

### Wednesday 19 August

09.15-10.00 (room 3213) Lecture "How to write a lab notebook + Basic concepts in molecular biology" (Pål Ø. Falnes)

10.15-12.00: Demonstrations of radiation safety and calibration of pipettes (continued from Tuesday).

Laboratory work from 12.00:

Preparation of solutions.

Transformation of the competent cells.

Pipetting exercises.

### Thursday 20 August

9.15 – 10.00 (room 3213) Lecture: "Stoffkartotek" ("Chemical data sheets") (Frøy Grøndahl).

Laboratory work from 12.00:

Counting the number of transformants, and calculating the competence of the cells.

Fill boxes with pipette tips, run autoclave (dry)

Prepare the course laboratories for the next two weeks.

Learning routines for cleaning and tidying up, learning how to run the glassware dishwasher.

Make records of the calculations of how much substance to weigh in for each of the solutions, and answer the questions about the chemical datasheets.

### Friday 21 August

No teaching, due to "Masterdag" (presentation of master thesis projects).

**Weeks 35 and 36:**

**Topic: Cloning and mutagenesis**

Laboratory work in lab 2117.

Lectures in room 3213.

Start: Monday (24. Aug. or 31. Aug.) at 9.15 in room 3213.

	Monday	Tuesday	Wednesday	Thursday	Friday
9.15-10.00	Lecture "Mutagenesis"	<b>Deletion mutant</b>	<b>Point mutant</b>	<b>Deletion mutant</b>	<b>Deletion mutant</b>
10.15-11.00	Presentation lab course	Purification of PCR-product	Inspect plates	Inspect plates	Miniprep
11.15-12.00	Preparation lab course	Gel analysis  <b>Point mutant</b> Gel analysis Dpn1 treatment	<b>Deletion mutant</b> Run gel Purification from gel Set up ligation reaction	<b>Point mutant</b> Miniprep Restriction cutting	Restriction cutting Gel analysis
12.00-13.00	Lunch	Lunch	Lunch	Lunch	Lunch
13.00-	<b>Point mutant</b> Set up PCR reaction.  <b>Deletion mutant</b> Set up PCR reaction.  <i>Lab journal writing</i>	<b>Deletion mutant</b> Restr. cutting  <b>Point mutant</b> Transformation  <i>Lab journal writing</i>	<b>Point mutant</b> Set up cultures for miniprep  <b>Deletion mutant</b> Transformation  <i>Lab journal writing</i>	<b>Point mutant</b> Gel analysis  <b>Deletion mutant</b> Set up cultures for miniprep  <i>Lab journal writing</i>	<b>Presentation of the results</b>

**Weeks 35 and 36:**

**Topic: RT-PCR and subcellular localization (laboratory 2418)**

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

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

## **Week 37**

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

### Monday 7 September

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

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

12.15 - 15.00. (PC-room 1413). Lectures and exercises in information skills (Kirsten Borse Haraldsen): The reference management program EndNote, relevant literature databases, scientific communication etc.

### Tuesday 8 September

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

13.15 - 16.00 (PC-room 1413). Lectures and exercises in information skills - continued (Kirsten Borse Haraldsen)

### Wednesday 9 September

9.15 - 11.00. "DNA as a changing molecule; Phylogenetic analysis and population genetics" (Kamran Shalchian-Tabrizi)

11.15 - 12.00. Lecture: "Chemical synthesis of DNA and RNA oligonucleotides" (Eshrat Babaie)

### Thursday 10 September

9.15 - 11.00 (PC-room 1413). Lectures and exercises in information skills - continued (Kirsten Borse Haraldsen)

12.15 – 13.00. Lecture: "RNAi - a useful tool for functional genomics studies" (Mohammed Amarzguioui)

13.15 – 14.00. Lecture: "Microarrays - Reshaping research" (Leonardo A. Meza-Zepeda)

### Friday 11 September

9.15 – 11.00. Lectures: "Introduction to bioinformatics" (Torbjørn Rognes)

12.15 – 15.00. (PC-room 1413) Bioinformatics exercises: Retrieving DNA and protein sequences from databases, sequence alignments, BLAST searches (Torbjørn Rognes and Pål Ø. Falnes).

## **Week 38**

All lectures in week 38 will be held in room 3213, if not indicated otherwise.

### Monday 14 September

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

10.15 – 11.00. Lecture: "Expression of recombinant proteins in *E. coli*" (Pål Ø. Falnes)

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

### Tuesday 15 September

Until ~14:00: "Life Science Career Day"

14.15 – 15.00. Lecture: "*C. elegans* as a model organism" (Hilde Nilsen)

15.15 – 16.00. Lecture: "Gene transfer to plants - vectors and strategies" (Melinka Butenko)

### Wednesday 16 September

9.15 -10.00. Lecture: "Unravelling gene functions by studying gene-targeted mice" (Arne Klungland)

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

12.15 – 13.00. Lecture: "Introduction and expression of genes in mammalian cells" (Trine J. Meza)

### Thursday 17 September

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

### Friday 18 September

9.15 - 12.00. (PC-room 1413) Vector NTI exercises – continued (Paul Grini and Pål Ø. Falnes).

## **Week 39**

Exam