

BCH 462 Biotechnology & Genetic engineering [Practical]

Lab (0) Introduction



Marks distribution

Tasks	Marks	
Lab assignment	6 Marks	10
Quiz	5 Marks	8
Oral exam/ presentation	3 Marks	5
Homework	2 Marks	5
Practical	1 Mark	2
Final	13 Marks	
Total	30 Marks	

Final exam ...

Writing a scientific report

➤ The scientific reports (**Lab assignment**) should contain the following:

1. **Materials and method (Experimental):** Written as methodology.
2. **Results:** This section states what you found. Tables, graphs or calculation should be included.
3. **Discussion:**
 - In this section you are required to describe of **what happened** in the experiment [Principle].
 - Explain your results (reasons for **why** you get your results).
 - Make conclusions by comparing your results to **expected values**.
 - In case of unexpected results, justify or **explain** the reasons why you have obtained such results.

“The Discussion must answer the question "What do the results mean?" It is an argument based on the results.”

➤ When writing an assignment, consider the following:

- Write **references**.
- Write table/figure **legend** and **title**.
- **Justify** the text.
- **Font:** Times New Roman.
- **Size:** title: 16 pt., subtitle: 14 pt. and body: 12 pt.

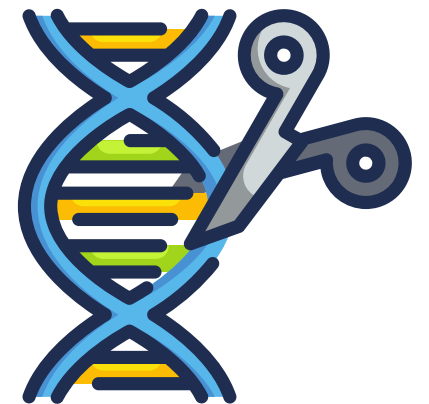
Biotechnology

- **Biotechnology** is a technology that utilizes biological systems, living organisms or parts of this to develop or create different products.

💡 **Pause and Think** is biotechnology considered as a modern field?

- **Applications:**

- Medicine
- Industry
- Agriculture
- Forensic
- Environment



Genetic engineering

- **Genetic engineering** is the process by which scientists modify the genome of an organism.

This modification of genetic material will produce:

- Organisms with desired heritable traits or characteristics.
- Could have some potential risks, for example, the inserted genes may have unexpected harmful effects.

General lab safety

- **Keep a safe distance.**
- **Never leave the lab without informing the instructor.**
- You must know all lab exits, eye washer, fire extinguisher, and first aid kit provided in the lab.
- Never eat, drink or chew gum in the lab. Do not taste, smell or touch any chemical.
- Tie your hair before doing an experiment.
- Closed-toed shoes should be worn at all times.
- Wash your hands with disinfectant soap after an experiment.

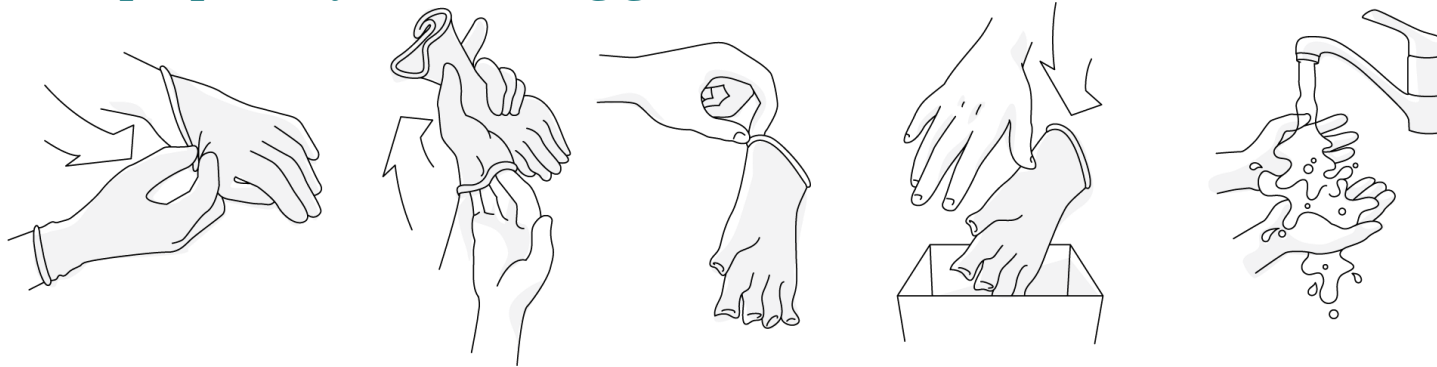


Protective personal equipment:

- Place your bag in the correct area.
- Protective gloves and glasses should be worn when handling hazardous materials.
- Lab coat and masks should be worn at all time in the lab.



The proper way of removing gloves:



Sterile technique for bacterial cultures

Aims:

1. Preventing contaminant organisms from getting into your cultures.
 - ▶ Contamination sources e.g. the air and unsterile equipment.
2. Preventing any organisms or accidental contaminants from getting out or Escape from cultures

Procedure:

Ahead of experiment:

- The media and glassware must be **autoclaved** in steam at 121°C for 20 min.
- Mouths of culture tubes, inoculating hoops and spreaders must be **flamed** using a Bunsen burner.

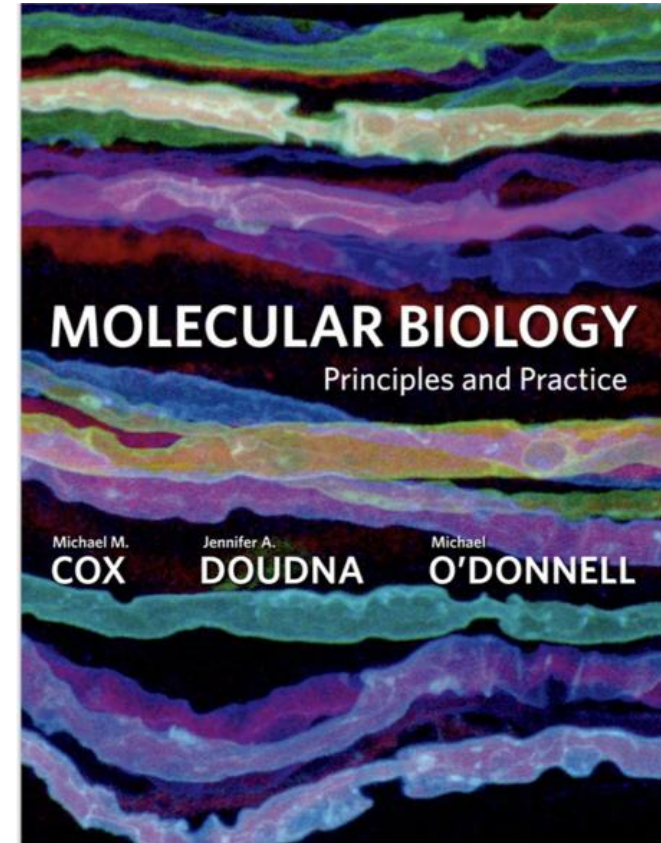
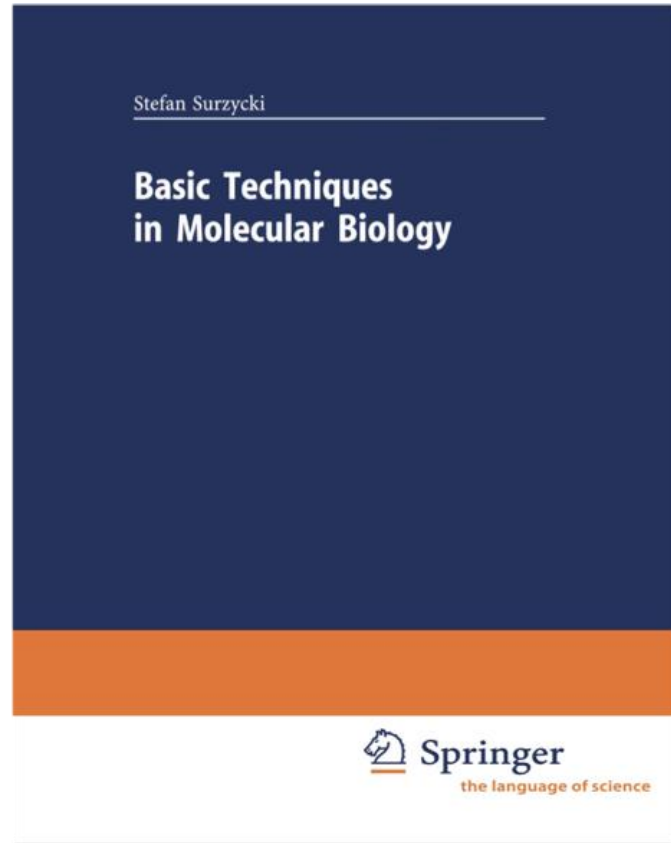
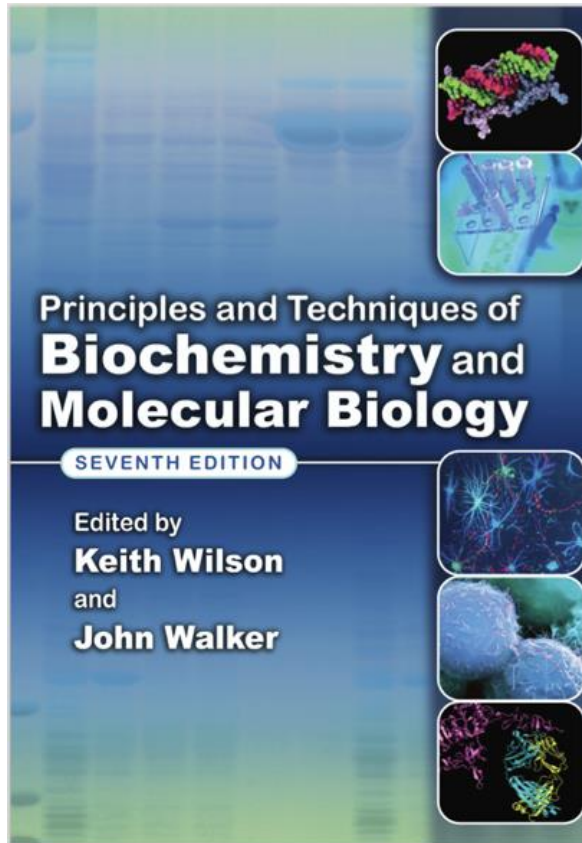
Afterwards:

- Used pipettes and discarded tubes must be disposed of into **disinfectant**.

Precautions regarding biotechnology lab

1. Always wash your hands and spray with 70% ethanol or wear gloves.
2. Always keep the caps on the polystyrene tubes loose so that air can circulate. Only cap tightly when the cells are no longer growing and are being stored in the refrigerator until the transformation efficiency has been calculated.
3. When scraping the frozen cell sample, hold the microcentrifuge tube at the top rather than at the bottom, so that the sample does not fully thaw. (one may want to keep the frozen samples on dry ice.)
4. Ampicillin (used in lab 2) can cause allergic reactions on contact with skin to those who are sensitive to penicillin. Do not touch the agar.

Sources of information



<https://www.dropbox.com/sh/lxl4iex153oq7m1/AACF8fuS-PCOZYceQVhRdO1ia?dl=0>