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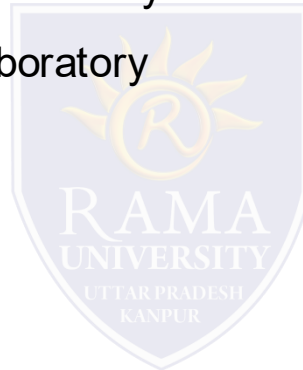
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FACULTY OF ENGINEERING  
&  
TECHNOLOGY

# LT.6 Design of animal tissue culture laboratory

## Outline

1. Principle of Tissue culture Laboratory Design
2. Layout plan of animal tissue culture laboratory
3. Floor plan of animal tissue culture laboratory
  - a. Standard animal cell culture laboratory
  - b. Teaching animal cell culture laboratory



# Principles of animal tissue culture laboratory design

- Stringent aseptic condition is required to grow animal cells & tissue outside the body
- Isolated and dust free environment
- Minimized entry & exit of unauthorized personnel
- Should be spacious for accommodating future equipment or extension of lab
- Should be maintained at positive pressure
- The floor should be covered with coved vinyl, acrylic coating, or other dustproof finish
- There should be proper sealing of wall joints and other openings.



# Layout Plan of animal tissue culture laboratory

**A tissue culture lab should essentially accommodate these six functions:**

1. Sterile handling
2. Incubation
3. Preparation
4. Wash up
5. Sterilization
6. Storage

## **1.1 Sterile handling area**

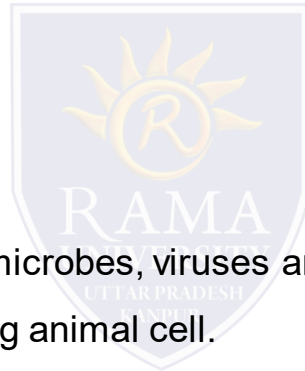
- It should use HEPA filter to filter out airborne microbes, viruses and dust.
- Use laminar hood for culturing and transferring animal cell.

## **1.2 Service Bench**

It may be convenient to position a bench for a cell counter, microscope, and other critical instruments, close to the sterile handling area

## **1.3 Quarantine and containment**

- Separate room with air locks should be marked
- Newly imported cell lines or biopsies can be handled here until they are shown to be free of contamination, particularly mycoplasma and proscribed pathogens such as HIV or hepatitis B.

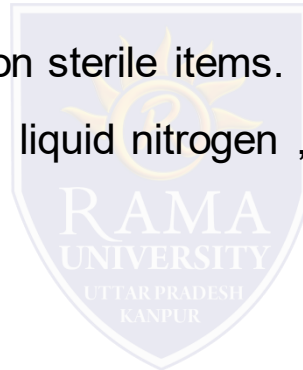


## 1.4 Incubation

- What type of incubation will be required is determined by size, temperature, gas phase, and proximity to the work space.
- CO<sub>2</sub> incubators are used for incubating open plates and dishes

## 1.5 Storage

- Storage area necessary to sterile and non sterile items.
- Labwares such as culture flasks, gloves, liquid nitrogen , reagent, media etc.



# Floor plan of animal tissue culture laboratory

- The requirements and scale of animal cell culture vary organization to organization, laboratory to laboratory or even person to person.
- Some lab may be interested in basic research, or applied research or some lab may investigate large scale production using cell culture.
- we will discuss the requirements for three types of tissue culture setups: **the teaching, laboratory, the standard research laboratory, and the optimal tissue culture laboratory.**

## **The standard tissue culture facility**

- Adequate for cell culture use for most cell and molecular biology laboratories, as well as use by physiologists, biochemists, and others who might occasionally need access to a culture facility.

## **Teaching Laboratory**

- Teaching cell culture laboratory is mainly constructed to give exposure to undergraduate and graduate students some wet lab exposure of handling cell culture.
- A teaching laboratory should minimally contain a laminar hood, refrigerator, CO<sub>2</sub> incubators, an inverted phase contrast microscope with 10 X and 20 X objectives, distillation unit for distilled water for media preparation.

## **The optimal tissue culture laboratory**

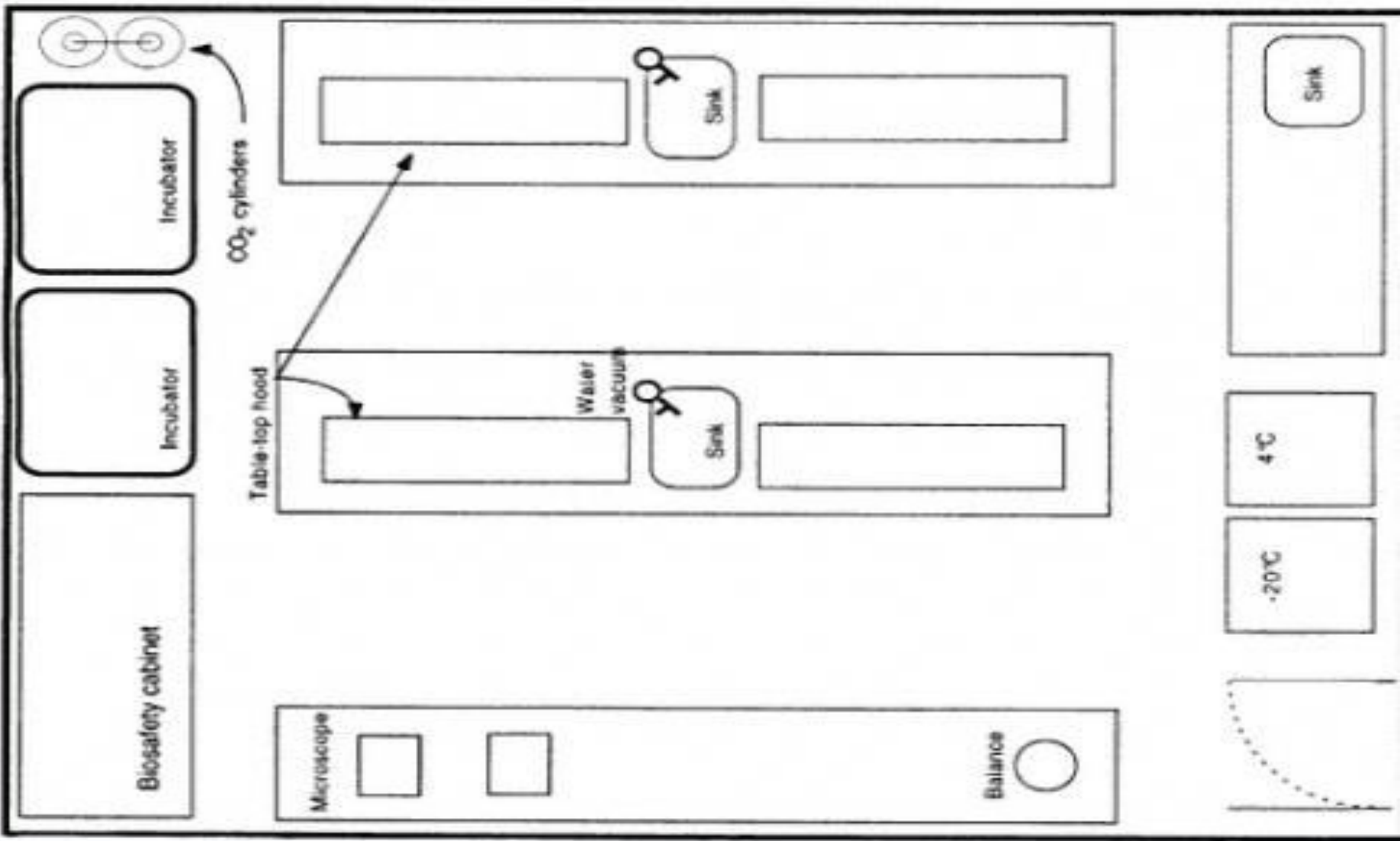
The optimal tissue culture laboratory is one that would serve a scientist whose main focus of research is cell biology.

**Click on link for floor plan of various animal tissue culture laboratory**

<https://slideplayer.com/slide/9281670/>

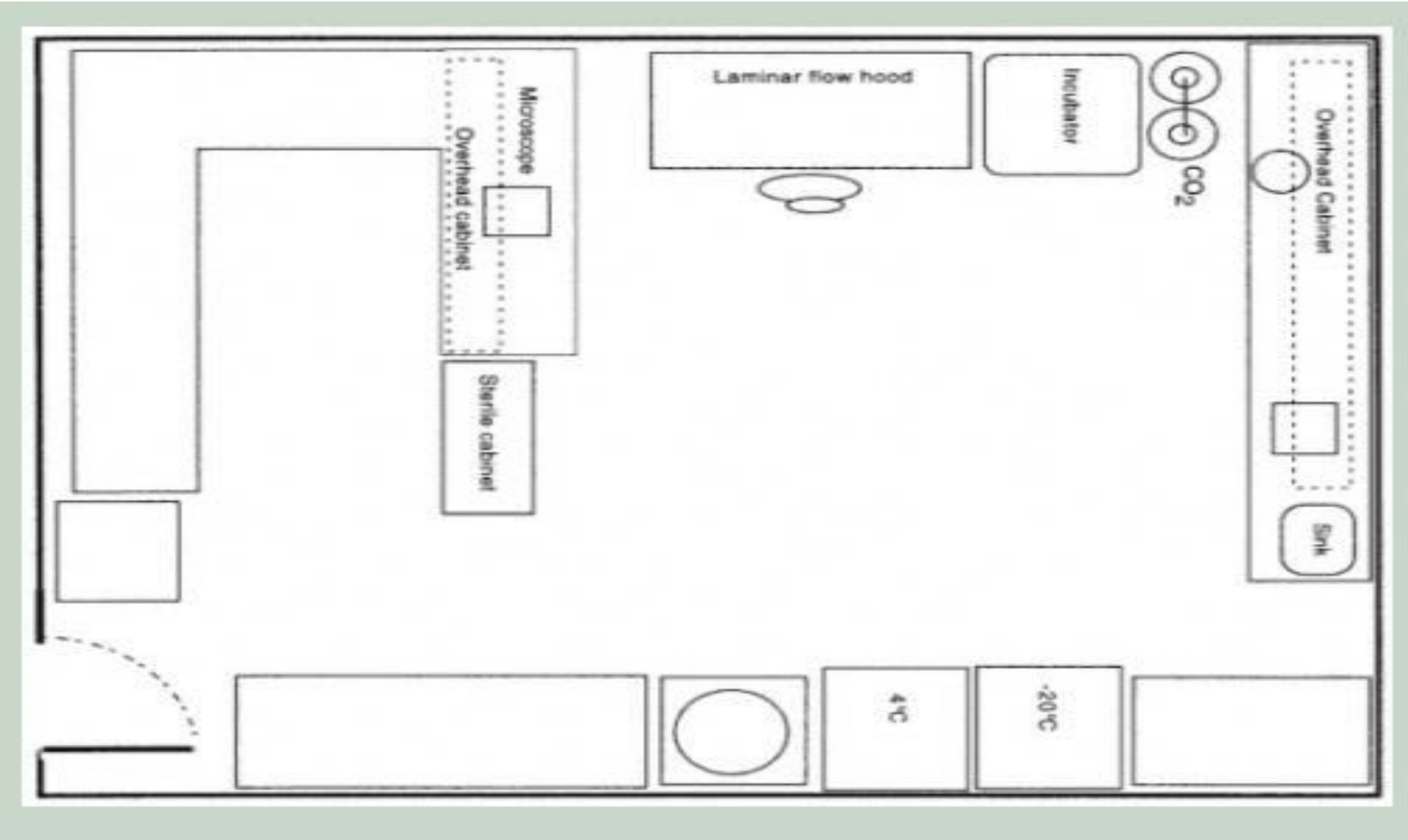


# Floor plan of teaching laboratory

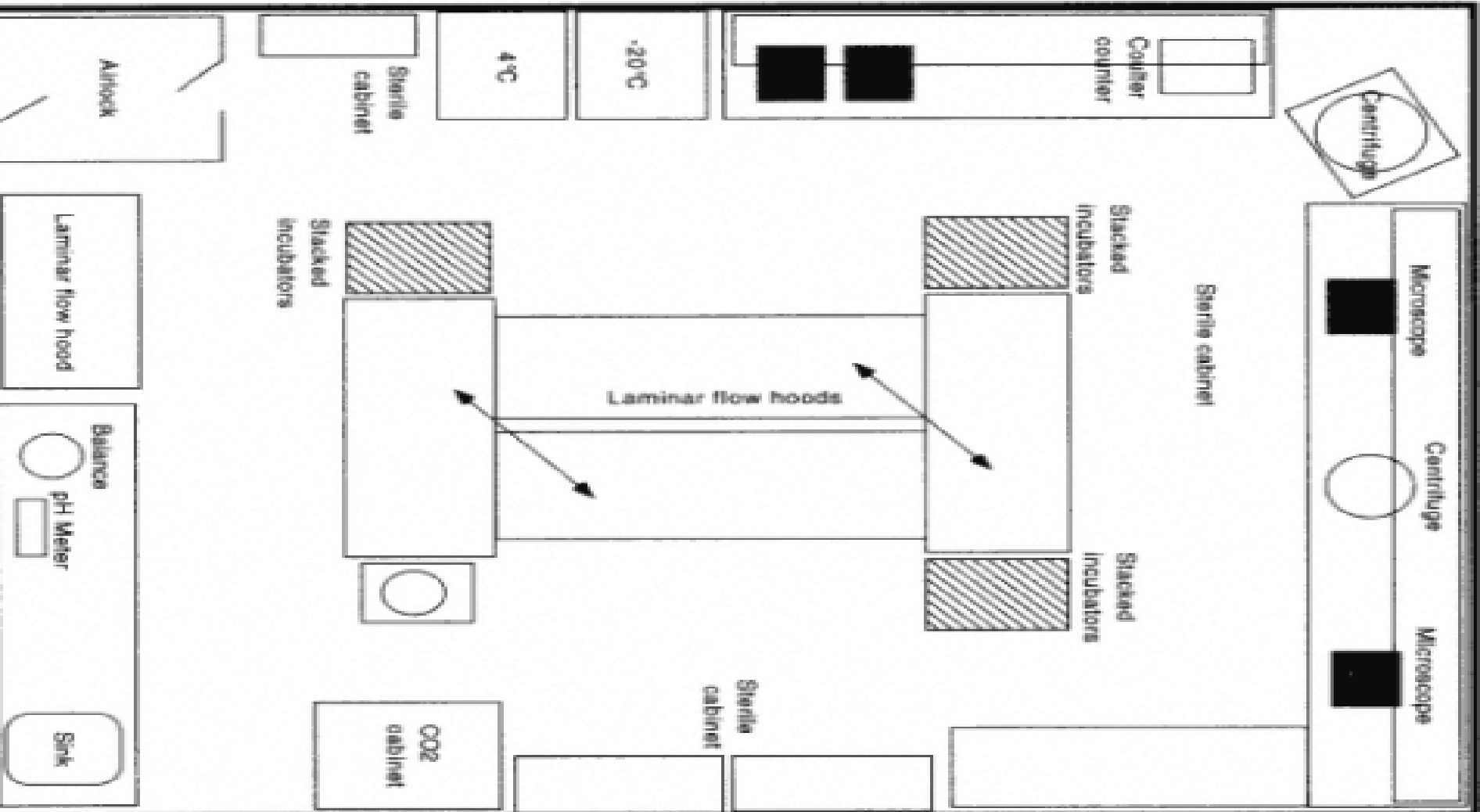




# Floor plan of research laboratory



# Floor plan of standard tissue culture laboratory



# References & Suggested reading

1. <https://slideplayer.com/slide/9281670/>

## Suggested reading

1. Watson, J.D., Gilman, M., Witowski J. and Zoller, M. Recombinant DNA, 2nd ed., Scientific American Books, 1983
2. Glick, B.R. and Pasternack, J.J. Molecular Biotechnology, 3rd ed., ASM Press, 2003
3. Davis J.M. Basic Cell Culture: A Practical Approach, IRL Press, 1998
4. Freshney R.I. Animal Cell Culture a practical approach, 1987

