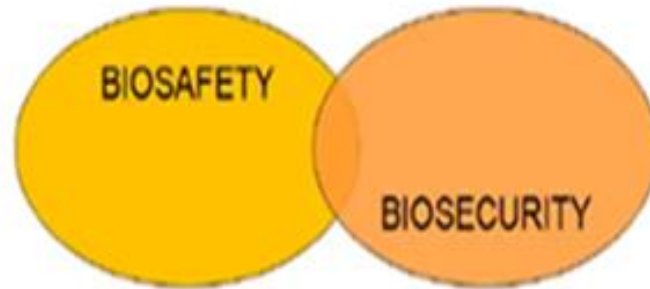



Biosafety & Biosecurity



Assist. Prof. Dr. Sumaiah Ibrahim

INTRODUCTION

- Disease diagnosis, human or animal sample analysis, epidemiological studies, scientific research, and pharmacology developments: all of these activities are carried out in biological laboratories in the private or public sectors.
- Biological materials are handled worldwide in laboratories for numerous original and valid purposes
- where small and large volumes of live microorganisms are replicated
- where cellular components are extracted.

- 
- and many other manipulations undertaken for purposes ranging from educational, scientific, medicinal and health-related to mass commercial.
 - and/or industrial production. Among them, an unknown number of the facilities, large and small, work with dangerous pathogens or their products every day...

- The general public expects laboratory personnel to act responsibly and not to expose the community to biorisks.
- To follow safe working practices (biosafety) associated with practices that will help keep their work and materials safe and secure (biosecurity), and to follow an ethical code of conduct (bioethics).
- Often suspicious of work taking place in laboratories, the uninformed public may even feel threatened by the presence of a biological laboratory in their neighborhood..

➤ It is the technical and moral duty of laboratory managers and laboratory workers, with the support of national authorities, to reassure the general public, to persuade them that the activities being conducted are beneficial and necessary, and to prove that the biorisks inherent to laboratory work are controlled with appropriate safeguards to meet their expectations.

- Pathogens and toxins have been used, even in the recent past, to threaten and harm people, to disrupt society, economies and the political status quo .
- This has happened in spite of applicable international agreements banning the use of biological agents for malicious use. As those who carry out such acts show disregard for ethical values , do not respect the right of people to a safe and peaceful life, or do not recognize global treaties and conventions, several regulatory approaches to limit unauthorized access to biological agents and toxins available in biological laboratories are now being carefully considered and implemented worldwide.

Occupational Safety and Health

Occupational safety and health is defined as the science concerned with preserving human safety and health, by:

- **providing safe working environments free from the causes of accidents, injuries or occupational diseases.**

- **Or in other words it is a set of procedures, rules and regulations within a legislative framework aimed at preserving the human being from the risk of injury and preservation on the property from the risk of damage and loss.**



- **Occupational safety and health are involved in all areas of life.**
- **When we deal with electricity or household electrical devices, it is essential to follow safety rules and their principles.**
- **when driving cars or even walking on the streets, we need to follow safety rules and principles.**
- **To safety rules, but we can say that when taking medicines for treatment or food for the growth of our bodies, we need to follow safety rules.**

General objectives of the Occupational Safety and Health

1. Protecting the human from injuries resulting from the hazards of the work environment by preventing them from being exposed to accidents, injuries and occupational diseases.

2. Preserving the components which represented in the installations and the devices and equipment they contain from damage and loss as a result of accidents

3. Providing and implementing all occupational safety and health requirements that ensure the provision of a safe environment that achieves protection from risks for the human and physical components.

4. Occupational safety and health as a scientific approach aims to establish safety and assurance in the hearts of workers while they carry out their work and to reduce the worry and fear attacks that trouble them as they coexist by virtue of the necessities of life with tools, materials and machines in whose folds there is a danger that threatens their lives and under insecure conditions that expose their lives from time to time to dangers Fatal.

Why we need biosafety ????

- 1. Lab has hazards of processing infectious agents**
- 2. Accidental threat to workers and environment**
- 3. To have adherence with safety regulations while dealing with highly infectious agents**



Definitions

Biosafety

It is containment principles, technologies and practices that are implemented to prevent the unintentional exposure to pathogens and toxins, or their accidental release

- **The maintenance of safe conditions in biological research to prevent harm to workers, non-laboratory organisms, or the environment.**
- **A fundamental objective of any biosafety program is the containment of potentially harmful biological agents.**

The term “**containment**” is used in describing safe methods, facilities and equipment for managing infectious materials in the laboratory environment where they are being handled or maintained.

Biosecurity: Control of accidental and deliberate release of biohazardous material

Accountability

Accountability ensures that valuable biological materials (VBM) are controlled and traced as intended, by formally associating the specified materials with the individuals who provide oversight and are held responsible for them.

Bioethics

The study of the ethical and moral implications of biological discoveries, biomedical advances, and their applications as in the fields of genetic engineering and drug research.

Bioethics is one of the three components that contribute to a successful biorisk management culture.

Biological laboratory

A facility within which microorganisms, their components or their derivatives are collected handled and/or stored.

Biological laboratories include:

clinical laboratories, diagnostic facilities, regional and/national reference centers, public health laboratories, research centers (academic, pharmaceutical, environmental, etc.) and production facilities (manufacturers of vaccines, pharmaceuticals, large scale GMOs, etc) for human, veterinary and agricultural purposes.

Code of conduct, code of ethics, code of practice

Non-legislated guidelines which one or more organizations and individuals voluntarily agree to abide by, that set out the standard of conduct or behavior with respect to a particular activity .

Control

Control is the combination of engineered and procedural measures that ensure valuable biological material (VBM) are used only as intended.

Valuable biological materials (VBM)

Biological materials that require (according to their owners, users, or regulators) administrative oversight, control, accountability, and specific protective and monitoring measures in laboratories to protect their economic and historical (archival) value, and/or the population from their potential to cause harm. VBM may include pathogens and toxins, as well as non-pathogenic organisms, vaccine strains, foods, genetically modified organisms (GMOs), cell components, genetic elements, and extraterrestrial samples

Dual-use

Initially used to refer to the aspects of certain materials, information and technologies that are useful in both military and civilian spheres.

The expression is increasingly being used to refer not only to military and civilian purposes, but also to harmful misuse and peaceful activities.

