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RISK GROUPS AND BIOSAFETY LEVEL DEFINITIONS

Biological agents:

Group 1 - is unlikely to cause human disease;

Group 2 - can cause human disease and might be a hazard to workers; it is unlikely to spread to the community; there is usually effective prophylaxis or treatment available;

Group 3 - can cause severe human disease and present a serious hazard to workers; it may present a risk of spreading to the community, but there is usually effective prophylaxis or treatment available;

Group 4 - causes severe human disease and is a serious hazard to workers; it may present a high risk of spreading to the community; there is usually no effective prophylaxis or treatment available.

Facilities:

Biosafety level 1 is suitable for work involving well-characterized agents not known to cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment.

Biosafety level 2 is similar to Level 1 and is suitable for work involving agents of moderate potential hazard to personnel and the environment.

Biosafety level 3 is applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents which may cause serious or potentially lethal disease as a result of exposure by the inhalation route.

Biosafety level 4 is required for work with dangerous and exotic agents which pose a high individual risk of aerosol-transmitted laboratory infections and life-threatening disease.

ASEPTIC TECHNIQUE

In spite of the introduction of antibiotics, contamination with microorganisms remains a problem in tissue culture. Bacteria, mycoplasma, yeasts and fungal spores may be introduced by operator, atmosphere, work surfaces, solutions and many other sources. In order to avoid contamination sterile technique should be used while handling cell cultures.

Correct aseptic technique should provide a barrier between microorganisms in the environment and the culture within its flask or dish. Hence, all materials that will come into direct contact with the culture must be sterile and manipulations designed in such manner that exclude direct link between the culture and its nonsterile surroundings.

Aseptic technique is a combination of procedures designed to reduce the probability of infection.

Work surface should be kept clean and tidy:

1. Start with completely clear surface and swab down liberally with 70% alcohol.
2. Bring onto the surface only those items you require for a particular procedure; swab bottles, cans, etc., with 70% alcohol beforehand.
3. Remove everything that is no longer required, and swab down before the next procedure.
4. Arrange items to have easy access to all of it without having to reach over one item to get at another.
5. Work within your range of vision, e.g., insert a pipette in a pipetting device with the tip of the pipette in your line of sight continuously and not hidden by your arm.
6. Mop up any spillage immediately and swab with 70% alcohol.

7. Remove everything when you have finished and swab down again.

RULES FOR THE HANDLING OF CHEMICALS

Almost all chemicals can be harmful in some way and prolonged exposure may cause long-term effects as yet unknown. All work with highly toxic, toxic, carcinogenic, dangerous to human reproduction and/or mutagenic substances must be conducted under the hood (digestorium).

When handling chemicals the following rules must be strictly observed:

1. Always read labels before handling any chemical. Learn the hazard warning symbols which are displayed on the labels.
2. Take care to avoid spillage - if this occurs, neutralize any hazard and clean up immediately, including the outside of the container.
3. Always wash the hands thoroughly after handling any chemical regardless of its present hazard rating.
4. Some chemicals have a delayed or cumulative effect. Always inform the safety representatives if any vague feeling of being unwell occurs regularly when using any chemical.
5. Chemicals must not be disposed of by indiscriminate washing down a sink. Consult the appropriate hazard data sheet and follow the instructions therein.

CHEMICAL HAZARD SYMBOLS



(T) Toxic



(C) Corrosive



(T⁺) Very toxic



(E) Explosive



(O) Oxidizing



(F⁺) Extremely flammable



(Xi) Irritant



(F) Highly flammable



(Xn) Harmful



(N) Dangerous for the environment

OTHER SAFETY PRECAUTIONS

- Wear laboratory coat and gloves. Wear proper shoes (not sandals), tie back loose hair.
- When working with laboratory equipment take care to avoid electric shock.
- Never taste laboratory materials. Food or drinks are prohibited in the laboratory.
- Do not touch cell suspensions or colonies with bare hands. Contaminated spots on clothes or body can be sprayed and washed with water.
- Contaminated material should be put into special containers.
- Every solution you make and want to store should be properly labeled (name, date, contents).

FURTHER READING:

<http://www.absa.org/resriskdef.html>

Freshney R. I. Culture of animal cells: a manual of basic technique. 3rd ed. Wiley-Liss, Inc. New York, 1994.

NOTES
