

SGM BASIC PRACTICAL MICROBIOLOGY

Good Laboratory Practice for All

Just like any other activity in a laboratory, all microbiology practicals require the user to adopt good laboratory practice. These brief notes and hints are intended to help those involved in the various activities to carry them out safely. **Remember** that before any practical activity is undertaken a risk assessment should be performed to ensure there is minimal hazard to all concerned. If there is any doubt about the assessment of the risk, reference must be made to safety texts or expert advice taken.

Microbiological safety

The techniques and activities described here and the micro-organisms suggested present minimum risk given good practice. It is therefore essential that good microbiology laboratory practice is observed at all times when working with any microbes.

There are five areas for consideration when embarking on practical microbiology investigations which make planning ahead essential.

- 1 Preparation and sterilisation of equipment and culture media.
- 2 Preparation of microbial cultures as stock culture for future investigations and inoculum for current investigation.
- 3 Inoculation of the media with the prepared culture.
- 4 Incubation of cultures and sampling during growth.
- 5 Sterilisation and safe disposal of all cultures and decontamination of all contaminated equipment.

Good organisational skills and a disciplined approach ensure that every activity is performed both safely and successfully.

Protection

Food or drink should not be stored or consumed in a laboratory that is used for microbiology. One should not lick labels, apply cosmetics, chew gum, suck pens or pencils or smoke in the laboratory. Hands should be washed with disinfectant soap after handling microbial cultures and whenever leaving the laboratory. If hand contamination is suspected, then the hands should be washed immediately with disinfectant soap. To ensure that any wounds, cuts or abrasions do not get infected or infection is passed on, protect them by the use of waterproof dressings or wear disposable surgical gloves.

General personal safety

Each individual embarking on these, or any other, activities is responsible for their own safety and also for the safety of others affected by their work (students, technicians, teachers). The individual must include in the planning and performance of the investigation a risk assessment to assess any hazard that the investigation may pose and ways of minimising it. Points to consider include: safe storage and culturing of micro-organisms; emergency procedures such as dealing with spillages and disposal of all contaminated material. No one should perform any microbiological procedures without receiving appropriate training from a competent person. To minimise the chance of contamination of the user, any other individual, the environment or the microbial culture good laboratory practice is required. GLP requires us to consider all cultures as potentially pathogenic.

Aseptic technique

Sterile equipment and media should be used to transfer and culture micro-organisms. Aseptic technique should be observed whenever micro-organisms are transferred from one container to another. Contaminated equipment should preferably be heat sterilised by either incineration or autoclaving. A suitable chemical disinfectant can be used but this may not ensure complete sterilisation.

Electrical safety

Some microbiology investigations use bioreactors that require oxygenation and this is usually supplied by the use of an aquarium air pump. Care should be taken to ensure that no liquid comes into contact with electrical mains power. The same care should apply if a magnetic stirrer is to be used to mix the growth medium in a bioreactor.