

## PCR Laboratory Planning Exercise

- You have been selected to help renovate your laboratory to create a PCR Laboratory to be used for molecular testing.
- Help the renovators and engineers by placing the following equipment in the best location on your laboratory diagram. Peel the stickers, cut the equipment apart.
- **THE EQUIPMENT IS SIZED TO SCALE ACCORDING TO THE LABORATORY. DO NOT CUT INTO THE COLORED SECTION OF THE EQUIPMENT.**
- Adhere each piece of equipment to the laboratory diagram in your desired location.
- **Think before you stick!** Once a sticker is placed it will be difficult to remove.
- Be prepared to share your laboratory diagram with the group.

### Equipment to place in the lab:

PCR Work Station

Refrigerator/Freezer

Laboratory Shoe Storages

Pre-PCR Coat Rack

Laboratory Coat Rack

PCR Shoe Storage

BSL3 shoe storage

Sonicator

Water Bath

Storage Cabinet

Class II Biosafety Cabinet (BSC)

Stools

PCR Hood

Thermocycler

Centrifuge

Twincubator

Hand washing sinks

Air conditioner (AC)

Trolley/Cart

Extractor fan (EF)

Biohazard and regular waste containers

Biohazard spill kit

Eye wash station (EW)

Fire Extinguisher

Lab gown rack for TB culture work/processing gowns (tie in back) with N-95/shoe storage and

### Guidelines to consider for laboratory set-up:

- Walls, ceilings, floors, and bench-tops should be smooth, easy to clean, impermeable to liquids and resistant to disinfectants
- Reliable and adequate supply of electricity, with generators and battery back-up to ensure consistent power supply
- Prevent contamination by separating the three major work phases of PCR
- BSCs (Class II certified annually) and centrifuges with safety cups for specimen processing
- Functioning autoclave should be located in the laboratory for appropriate infectious waste management
- Sinks with reliable running water located near exits for hand washing
- Safety station with fire extinguisher, emergency shower, and eye wash near by
- Flow of air in the laboratory should be from the least infectious work to the most potentially infectious work
- Place biosafety cabinets in contained or low traffic areas orientated in such a way that drafts and air disturbances across the cabinet are limited.
- Consider workflow in the laboratory set up plan; be conscious of the route the different reagents, specimens and amplified products take as they travels through the laboratory and attempt to make it uni-directional.
- Keep in mind that you have to dedicate certain protection tools, instruments and reagents to a particular work area that you cannot move to other areas afterwards due to safety reasons and to avoid contamination.
- Be conscious of the direction the air conditioner vents are directing air and if it would cause and air disturbances near biosafety cabinets or direct any fumes or potential aerosols toward lab workers. Keep in mind that air conditioner units will have a condensate line that will need to be drained.
- You do not need to use or place all the equipment that is available. You may decide that your laboratory does not need all the equipment. Be prepared to explain your choices.

- In a real laboratory design setting you would need to be concerned about the amount of power that each piece of equipment would draw and if your circuit breakers could comfortably carry the needed amount of power.
- In addition to power, the amount of heat produced by each piece of lab equipment should be considered and one would need to ensure that there are enough air conditioner units to offset the extra heat produced by new lab equipment.