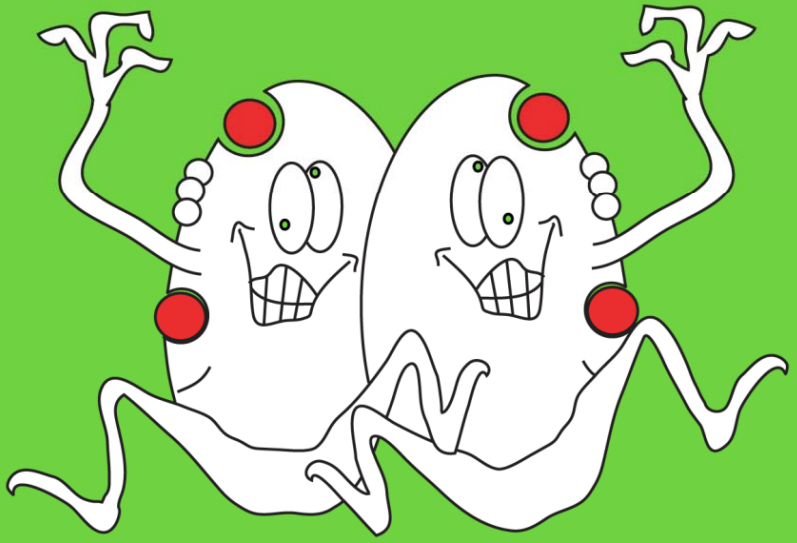
Recipes for a happy colleague.



Preface

I have made this little leaflet to provide a written reference for anyone using the cell labs on how we should work to maintain a good working environment. It is otherwise difficult to keep everyone up to date on the routines we have implemented for the labs to run smoothly. Hopefully, you will all appreciate the usefulness of a resource like this, and use it frequently.

With the very best wishes for my colleagues,

Eirik.

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Keep it clean

Any lab will benefit from a clean and ordered environment where reagents and equipment are easy to find and where working benches are available to do work on. In a Biosafety Level 2 lab – including both our cell labs – the requirements to orderliness in the working area are and should be even more stringent. The cell labs should at all times be clean and neat, and only the necessary equipment should be displayed at any time. Never should anything be left on the floor, nor on working benches, that does not belong there. This obstructs work and may in many ways be envisaged to pose serious risks to the lab workers – there certainly is a risk of someone tripping on loose objects on the floor.

Do yourself a favor and nurture good habits from the beginning: Prepare your working area properly before you start working, getting rid of “old fun” such as filled and decontaminated medium bottles, decontaminated byrettes and pipet tips, scribbles on the plexi-cover of the LAF bench, etc.; use small breaks throughout the day to refill consumables, return empty pipet-tip boxes and eppendorf-tube jars, and empty any filled trash containers; clean your equipment and working area properly when your work is finished, decontaminating all surfaces in the LAF bench and wiping off pipettors and the pipet-boy while also remembering to decontaminate any discarded medium.

These are all miniscule tasks when done successively in an orderly manner, but will quickly build up to insuperable nuisances if left unkempt.

Preparing for work

At this time of day, with a lot of work ahead of you, you can easily appreciate the value of a clean and ready-to-use lab. Coming into a lab that is filled with trash and leftovers from yesterday's feast is not a good start on a long day. Regardless of the tightness of your schedule, however, cleaning up after someone else invariably feels like a waste of time.

On the other hand, if the lab was cleaned up properly yesterday, all you should have to do at this point is starting up the LAF bench and wiping it down with 70 % ethanol. If you're working with infectious material you should also prepare the necessary 2 % (two spoons per liter) Virkon solutions for disinfection of used pipette tips and other utensils.

Washing reusable utensils

Reusable utensils (PBS bottles, plastic cups, etc.) are returned to the Kitchen for wash and/or autoclaving. They are collected in baskets located outside the cell labs and elsewhere in the lab. Any utensils returned to the Kitchen for washing and reuse MUST be safe to handle for the Kitchen personnel. As anything used in the cell labs will have been handled with gloves that are potentially contaminated with biological specimens and other hazardous agents everything you place in the Washing basket will have to be disinfected before you put it there. At a minimum, wipe down the utensils with 70 % ethanol. Utensils that have contained potentially infectious materials should, in addition, be disinfected with 1 % Virkon: Fill the container with 1 % Virkon and leave overnight, before rinsing in running water and spraying with 70 % ethanol.

Please note: **Plastic cups used to collect discarded media or other potentially biohazardous material must NOT be left by the sink.** Disinfect immediately in 1 % Bleach or 1 % Virkon (leave for minimum

half an hour), rinse in water and wipe with 70 % ethanol before placing these in the basket outside the cell lab.

Replacing consumables

While working in the cell lab, a day without centrifugation would be a day quite out of the ordinary. The many centrifugation steps actually give you some spare time on your hands. Therefore, if you at any time during the day find yourself twisting thumbs, or contemplating to do so, you should rather have a look around – there are always lots of things to do in a heavily used cell lab, also when you're not working. Take the opportunity to cheer up yourself and your coworkers by refilling the consumables and you will see that your work flows ever so much easier when everything is ready at hand as you need it. Some quick refills:

1. Plastic byrettes (5, 10, and 25 ml) are used rather frequently and require frequent refills. Grab a bag or two of each size from the cupboard in the hallway by the larger cell lab and refill the slots hanging on each of the LAF benches wherever you see fit. Remember to put them tip-first into the slots so they are easier to mount on the pipet-boy afterwards.

2. Even more frequently used are the centrifugation tubes, in 15 and 50 ml sizes. Venture into the "Store-lab" (with windows facing the stairways in our 'back yard') to pick up plastic bags of these tubes. In the larger cell lab, the tubes should be put into their respective dispensing box. Put the empty bag into the large waste-containers in the hallway, so as to not fill up the ones in the lab too quickly.

3. In a day you can use hundreds of pipet-tips – which will eventually need to be replaced with hundreds more. Bring empty pipet-tip boxes and place them on the technician's

bench when you pick up new boxes, which you will find in the glass cupboards of each of the two regular labs. Put the new boxes directly into place in the cell-lab cupboards – don't leave them on the bench, which is used for non-sterile staining procedures, microscopy, and more.

4. Cell-culturing accessories are all stored in the large cupboards around the corner from the larger cell lab. For our convenience, we always keep some of these in the cupboards of the respective cell labs. This also reduces the need to exit the lab while working on potentially infectious specimens. Also, since cell culture dishes and –flasks are commonly packaged in units of 5 or 10 articles, opening a new unit every time you need an article would not be feasible. Note that cell culturing dishes and –flasks are stored in the smaller cell lab only, while 96-well plates (U- and V-bottom) are stored in the larger cell lab. If you have spare time, refilling the stores of cell culturing accessories will save you some ado when you actually need them.

5. Another thing that you can do while spinning is emptying full and over-filled trash bins and biohazard buckets. The respective procedures are found elsewhere in this leaflet.

6. Gloves are replaced when needed. Discard the empty box among the cardboard waste after you have folded it neatly and removed any plastic within. Do not leave glove boxes on the bench, but install them in the wall-mounted holder.

Maintaining order in the lab

Keeping it clean is a great way of making friends in a small lab. Make sure to clean up the working area when you finish:

1. Disinfect and wipe down the LAF bench properly.

2. Remove any scribblings and sweaty forehead-stains on the glass shield; use pure ethanol, if necessary.

3. Disinfect the equipment that you have used, including racks and pipets. Soak spills in 1 % Bleach for at least 5 minutes. Spray other equipment with 1 % Bleach (in the hood) and leave to dry by the sink. Rinse when dried in running water and wipe with 70 % ethanol. Put into place in the cupboards immediately. The pipet-boys should be wiped with 70 % ethanol and mounted on the recharger.

4. Remove any empty containers (pipet-tip boxes, eppendorf-tube jars, buffer bottles, etc.) and shuttle them to their proper destination. Glass bottles should be put in the containers outside the cell labs or elsewhere in the lab marked 'Vask' – but only after proper disinfection! Empty pipet-tip boxes and eppendorf-tube containers should be put on the technician's bench to be refilled and autoclaved; plastic bottles should be rinsed and put in the plastic-waste bin (if present – otherwise, use the regular waste-bin). Organic waste that you have produced throughout the procedure is collected in plastic bottles for disinfection prior to disposal. Use an empty plastic buffer or medium bottle to collect the waste. When the bottle is full, or if you observe nearly full bottles by the sink that has not yet been disinfected, add one spoon (2-3 %) of Virkon to each bottle. It would be a good idea to do this in one of the LAF benches, as Virkon is an irritant. Mix by turning the bottle upside-down and let sit overnight. The next day, the contents of the bottle may safely be poured directly into the sink while keeping the water running. It may smell nasty, but it won't kill you. Do not leave full or disinfected waste-bottles on the bench for longer than absolutely necessary!

5. Empty your ice bucket in the sink and stow it in the cupboard under the sink. Try not to overfill the lab with such boxes – two or three will be quite sufficient.

Virkon

Virkon is the disinfectant of choice in our lab, as it kills both bacteria and viruses efficiently and is more effective than other disinfectants on organic waste. The Virkon concentration necessary for a proper disinfection depends on the task at hand. When disinfecting clean surfaces, 1 % Virkon (1 spoon in 1 liter) will be sufficient. However, when disinfecting organic waste a concentration as high as 3 % may be required. The optimal concentration for disinfecting pipet-tips and byrettes will be something in between; 2 per cent.

Laboratory waste

While working in the lab you should always be aware of the potential danger of the materials or organic systems you are working with. To avoid exposing your coworkers and yourself to potentially hazardous materials, always make sure that such materials are disposed of correctly, either in biohazard waste buckets, or in designated bottles or buckets for the collection of organic solvents and toxic substances. Importantly, the biohazard buckets are made for the disposal of biohazardous material only (human tissue or cells, transfected cell lines, etc.), and not organic solvents or other toxic substances, which will have to be handled separately. It is also important not to fill the biohazard waste buckets with non-hazardous waste. Normal, non-hazardous waste should be placed in the regular waste buckets. If you are disposing of larger articles, it may be worthwhile to place it directly in the larger waste bins, so as to not fill the smaller ones immediately.

Discarding cardboard boxes

Remove any plastic (tape, shipping tags) and fold the cardboard box as neatly as you can, before placing the folded box on the lower level of the trolley standing by the -80 freezer outside the isotope lab. Small cardboard items may be collected in another, small, cardboard box to maintain order and make it easier to move the trolley when it is full. As the trolley is full, it will be conveyed to the basement, where the cardboard boxes and biohazard waste is stored until collection. This is normally done by one of the technicians.

Discarding plastic materials

Any soft plastic material (typically polypropylene or –ethylene; including plastic bags and bottles) should be disposed of in the designated plastic recycling bin outside the larger cell-lab (NB: For the

time being, this bin sadly does not exist). Bottles should be disinfected with Virkon (if used for biological products, including BSA) and rinsed with water before disposal. The plastics will be recycled.

Emptying regular waste buckets

When the regular waste buckets are full, they are yours to empty. Rip off the full bag, and pull out a new one to be fastened to the bucket. Put the full waste bag in a larger trash bin. There is one just outside the cell labs.

Biohazard waste buckets

The biohazard waste buckets are made of heavy duty plastic and constitute a very convenient way of disposing of biohazardous material. However, to maintain the security and convenience these receptacles offer, it is important to obey the following simple rules:

1. Fill with biohazardous material only.

2. Do not overfill the container, as this will increase the risk of contamination when the bucket has to be sealed. It is a nasty job to shove contaminated and occasionally sharp utensils into an already full bucket. For the same reason, you should always make sure that whatever you put into the bucket is completely submerged in it. IMPORTANT: It is not allowed to put sharp objects such as needles or scalpels in any waste bucket without sheathing them in their original cover or another vessel first!

3. Replace the biohazard waste bucket when full with a new container. Seal the full container properly using the compatible click-on lid. Label the lid with the standard, premade note (to be found on top of the refrigerator opposite the cooling rooms) reading “Biologisk avfall til forbrenning. Ikke løsemidler. BiO.” and place the waste-bucket on the trolley standing by the -80

freezer outside the isotope lab. You will find new, empty buckets in either of the two regular labs. If both of these locations are empty, you should go to the storage room in the basement to fetch new ones.

Disinfecting liquid waste 

The liquid waste resulting from cell cultures etc. constitutes a source of potentially infectious material that should be handled promptly and with care. The best way to handle this waste is by immediately transferring it to a sealable container (such as a medium bottle) that you disinfect properly at the end of your working day. Using plastic cups for collecting this material is not recommended, as the waste cannot be disinfected in such an open container and since this renders the cups potentially hazardous themselves.

1. As you start up the LAF bench and prepare for work, wipe off an empty medium bottle (along with your other utensils) and place in one corner of the bench with the cap unscrewed and placed behind it.

2. When removing liquids (media or buffers) that have been in contact with potentially infectious material, transfer it immediately to the prepared waste bottle.

3. At the end of the day, after removing most of your equipment and before cleaning the bench, add Virkon to the bottle (one spoon to a full bottle) and turn it upside-down a couple of times.

4. The “Virkonized” waste should be left by the sink overnight for complete disinfection – but do not forget to empty it the next day! As the waste will now be safe, you may pour it into the sink. Flush afterwards with some water to clean the sink and remove any trace of bad smell.

LAF bench procedures

Start-up

Start the fan, ignite the built-in lamp, and activate the outlet by pressing the respective buttons on the LAF-bench panel. Keep the lights off if you need to work in the dark (but it is okay to leave the rest of the lights in the lab on); if you do not need to use the gas, leave the outlet power off. To use the gas, the outlet power must be turned on and the manual valve must be turned to point in the same direction as the gas outlet. Turning the valve either towards you or towards the back wall of the bench will close the vent.

To prepare for aseptic work, wipe down all working surfaces and equipment (including pipettors, pipet-boy, racks, etc.) with 70 % ethanol. Maintaining a truly aseptic technique requires that everything you use is wiped with 70 % ethanol and that you take precautions not to disturb the linear air-flow within the bench. For most purposes, however, an approximation to aseptic technique will be sufficient, and in many cases truly aseptic work will be too cumbersome and not practically feasible.

Shut-down

After working in the LAF bench, the bench-top should be disinfected and cleaned. If you have been working solely with non-infectious material (fixed cells, non-hazardous reagents, etc.) it will suffice to clean the bench once with 70 % ethanol. Used paper tissues may, in this case, be put in regular waste buckets. However, most of the work in our cell labs involve work with potentially bio-hazardous materials (primary human cells, transformed cell lines, etc.), implying a more rigorous disinfection procedure. All samples containing primary human cells should be considered as potentially biohazardous. In the case of

spills, soak immediately in 1 % Bleach or 2 % Virkon; leave for at least 10 minutes. Wipe off with 2 % Virkon and/or 70 % ethanol containing 1 % SDS. Contaminated paper tissues should be disposed of in the biohazard waste buckets.

How to...

Fill Ice

You can make your own mobile refrigerator by filling a Styrofoam box with coarse shredded ice, enabling you to keep your cells and reagents at about 0 °C. Remember to replace the boxes after use – you should find two to three (no more, no less) in each of the cell labs. The ice itself is located in an ice-machine in the Kitchen. Open the front of the machine and use the scoop to grab as much ice as you need. Afterwards, replace the scoop into its bucket and close the door of the ice machine. Also, if you spilled some ice on the floor, use the broom and dust-board to get it up and throw it in the sink – melted ice is really wet and might make the floor slippery.

Prepare 70 % Ethanol

70 % ethanol is a highly effective disinfectant for most microorganisms, and is widely used to disinfect surfaces and equipment. In the cell labs, 70 % ethanol is used extensively as a cheap and effective disinfectant. Importantly, the 70 % ethanol must be applied in sufficient amounts to wet the surface completely, and some microorganisms require prolonged exposure to 70 % ethanol in order to be killed (or sufficiently attenuated). The 70 % ethanol is prepared in a brown 2.5-liter bottle (there should be one in each of the cell labs), which is used to refill the two spraying bottles in the respective cell labs. When the spraying bottles are empty, you should refill them immediately rather than just using another one that is not (yet) empty. Find your way to Jorun's secret drawer and locate the key for the liquor locker, which is to be found in the left cooling room (closest to the cell labs). Withdraw two bottles of Rectified Ethanol (do not use Desiccated Ethanol, 100 %). Lock the cabinet and replace the key – and remember to write in the small book the number of bottles you took. Preparing 70 % ethanol

is really easy; to an empty 2.5-liter bottle, just add the two liters of Rectified Ethanol; refill one of the bottles with approximately 7 dl (2/3 full) of distilled water and add to the brown bottle; turn the bottle upside-down once. That's it.

Make a 1 % Bleach solution

Dilute the commercial 10 % Bleach 1:10 with DI water. The 1 % Bleach is best prepared in a small spraying bottle, since the Bleach has limited life-time once diluted. The 10 % solution should be stored at 4 °C in the dark (Bleach is both light- and heat sensitive); you will find it in the left cooling room (closest to the cell labs). When disinfecting equipment with Bleach, let sit till the Bleach has dried and rinse afterwards in running water to remove any crystal precipitates. Sprayed objects are put on the right-hand side of the sink to dry.

Use the Cell Counter

The cell counter is used for the counting of potentially infected cells from blood and biological specimens, so you should always use gloves when operating this instrument.

Follow the instructions posted on top of the Z2 Coulter counter (situated just across the hall from the smaller cell lab) to assess the concentration of suspended cells in your sample. Remember to dilute your suspension appropriately (normally 1:1000) in counting buffer, using the designated counting vials.

When you have finished counting your samples, rinse the electrode with DI water and place a vessel with clean diluent at the sample station. It is important that you flush the instrument after use, to avoid clogging of the instrument tubing and to minimize background counts. At the end of the day, if no one else will be using the instrument, you should prime the aperture with Beckman Coulter Clenz® cleaning agent

and leave the instrument to be cleaned overnight. More detailed instructions are posted on the instrument itself.

Safety issues

Gas safety

When working aseptically the use of a gas burner facilitates the removal of particles and microorganisms from the tip of a container before and after pouring from it. Our burners are fuelled with propane coming from a central gas supply through permanent gas lines – which means that if you forget to close the gas vent, there's virtually no end to the amount of gas that can seep into the lab, resulting in high risk of explosion or uncontrolled fire. Keep that in mind when you are working with gas, particularly when using the manual vents in the regular labs. In the LAF bench, fortunately, we use little Fire-boys to release and ignite the gas. These provide us with an extra level of security, because although you have opened the manual vent, gas will not start flowing into the lab. BUT, however safe these Fire-boys may be, they are not fool-proof, and the manual gas vent should therefore ALWAYS be closed when you leave the bench and when you're not using it. Make sure, also, that you know what to do if something should catch fire – there are fire blankets in each of the cell labs for such emergencies. Also, make sure not to place the Fire-boy in such a way as to not risk burning yourself or – even more importantly – the rubber tubing connecting the Fire-boy to the gas vent.

Biosafety

Both of the cell labs are considered to be of Biosafety Level 2. Everyone should be aware of the risks and necessary precautions implied by this classification. Required safety precautions are listed on the door of each of the cell labs. More information is available at \\dias\taskenarea in the folder Biosafety.

Other issues...

The Incubators

We all rely heavily on our incubators to maintain a 37 °C humid atmosphere containing 5 % CO_2. Small anomalies may have serious consequences to the viability of our cells. The incubators will normally tell us if they are not happy with the temperature or the CO_2-levels – however, there is no way they can check for humidity. Therefore, it is important always to check that the water basin in the bottom of the incubators is filled. If the basin is empty, or almost empty, refill it immediately with distilled and autoclaved water. If the basin goes dry, your cultures will dry out as well – this is of course of particular concern to small cultures, like those of 96-well plates. Autoclaved, distilled water is provided in brown 2.5-liter bottles from the Kitchen; when the bottle is empty, put it on the technician's bench to be refilled and get a new one from the Kitchen. Make sure that it has been autoclaved before using it (inspect the tape on the cork; it should have black stripes). Each of the incubator basins contains a copper plate that is effective in discouraging any intruding microorganisms, and it should therefore not be necessary to add disinfectant to the water.

If the incubator is beeping, something is wrong. Either the temperature has dropped, or the gas levels are low (or high). If the problem seems to be persistent, and you do not know what to do, notify a colleague that knows. If there is none available, transfer all flasks, dishes, and plates from the malfunctioning incubator into one that is working. Most commonly, when the alarm goes off, it is a gas issue. Everyone should be able to switch gas tanks – however, if you are not certain how to do it, don't.

Sterility

Sterile consumables, such as pipet tips and eppendorf tubes (which are autoclaved here at BiO), or byrettes, cell culture plates, and –flasks (which are sterilized by the manufacturer) are sterile for only as long as they are securely maintained in their sealed wrappings. Please make sure, therefore, that they are opened only within the laminar air-flow of your LAF bench. If you have, by accident, opened for instance a pipet-tip box outside of the bench, don't leave it in the bench as this might do harm to the work of your colleague using the bench after you. Instead, leave the box outside of the cabinet, on one of the trolley-tables, so that the pipet-tips can be used in work where sterility isn't an issue. Throwing the tips away directly is wasteful. In the cases where several sterile objects are contained within a shared wrapping, for instance with cell culture dishes, it can sometimes be difficult to judge whether or not the dishes are sterile and safe to use. Be careful when you remove a dish from the sealed bag, and always make sure to re-seal the bag afterwards. It is also important that you do not open a new bag every time (you know, just to be sure the dishes are safe) – but use from the ones that are already open (otherwise the cupboards will soon be filled up with utensils that no one wants to use). In this respect, everyone relies on each other for the availability of sterile utensils. For short-term incubations (up to several hours) sterility normally isn't a big issue, but it could be so for longer-term culturing (of cell lines, etc.). Please note, also, that due to limited space, cell culture dishes and –flasks are only stored in the smaller cell lab, where these are used more often. Correspondingly, 96-well plates are only stored in the larger cell lab.

To maintain aseptic conditions in your LAF bench it is important that it is never overfilled. The more stuff you put into the bench, the more you will disturb the airflow, causing turbulence and increasing the risk of infecting your samples. So, always keep the number of items in the bench to a minimum, only including the things you actually need for

the current procedure. Moreover, although the bench-ledge is convenient for storing pipettors and other equipment, you should try to limit the use of this ledge to collect clutter and waste, as this could seriously disturb the airflow.

Our LAF benches are constructed to protect primarily the user and not the sample – which is why they are also called biosafety cabinets. The vertical air-flows in the cabinet will circulate within the cabinet, only to escape through the exhaust on the top of the cabinet, where it is filtered. This is opposed to a horizontal air-flow cabinet, in which the air would be blown directly towards and exposing the user, while protecting the sample. Although the vertical air-flows do confer some protection to our samples as well, some precautionary practices are necessary to maintain aseptic conditions. Most importantly, you should never move your hands over your sample, since any dust or particles (which your hands and coat are positively charged with) may be blown directly into it. Moreover, it is important to avoid abrupt movements that may disturb the air-flow. Finally, as alluded to previously, the bench should be kept as neat as possible to limit air-flow obstructions causing turbulence. As a consequnce, **the number of pipet-tip boxes and eppendorf-tube jars – as well as any other equipment – should be kept at a minimum**.

Periodic maintenance

Cleaning the cell labs

Every three weeks the LAF benches, centrifuges, and incubators are washed thoroughly. This is important in order to avoid contamination of cultured cells and to maintain a clean and healthy working environment. Keep an eye on the list posted between the two cell labs to see when it is your turn to wash. Usually three or four people share the cleaning, and within a year it would normally not be required of you to wash more than once or twice. Use gloves while you clean.

1. Go over the list of what to do and share the work between the three (four) of you. You do not have to do all the washing at the same time, as long as the cleaning is completed within the assigned week.

2. Clean the incubators. One incubator in each lab must at all times be fully operational. Therefore, you may wash only two incubators at a time – one in each cell lab. Move all culture dishes, –flasks, and –plates to the neighboring incubator. Remove all of the shelves and brackets; take out the water basin and empty it. If you detect any visible stains, these should be washed off with Zalo. Otherwise, it will suffice to spray the parts with Barrycidal and leave them for half an hour, before wiping off with deionized (DI) water and spraying with 70 % ethanol. While the different parts are soaked with Barrycidal you may wash the incubator itself; spray down every surface with 70 % ethanol and wipe off. After re-inserting the water basin and the shelves, you may refill the basin with autoclaved DI water. Leave the incubator for half an hour to devoid it of ethanol fumes before you replace the cell cultures.

3. Clean the centrifuges. Turn off the centrifuge while you are cleaning it. First, empty the centrifuge of buckets and mop up any ice or water within the centrifuge. Spray the inside of the centrifuge with Barrycidal and leave for half an hour, before wiping off with DI water and spraying with 70 % ethanol. Wash all the buckets and holders with Zalo, rinse in running water. Spray with 70 % ethanol and re-insert into the centrifuge.

4. Clean the LAF benches. Unscrew the benchtop and remove it. Wipe the removed benchtop and the entire LAF bench (including walls, bottom, roof) with 2 % Virkon and let sit for half an hour to disinfect the hood and avoid exposing yourself to infectious agents. Wipe off plate and cabinet with DI water and spray and wipe with 70 % ethanol. Reinsert the bench-top plate. Finish off by wiping down the Plexiglas with pure (or 70 %) ethanol to remove scribblings and fatty stains.

5. Complete the job by going over the lab, especially around the sink, with a paper cloth to remove stains and dust. Throw away superfluous medium bottles and waste lying around. However, the users should normally take care of these things themselves, and if you find the lab in a messy state you should remind them of their duties.

Resources

BiO procedures and instructions

Please refer to the various BiO instructions for more detailed information on biosafety in our labs. Liv has been working recently on updating and translating these instructions, and have made several of them available on the internal network (see taskenarea/#BiO Instructions):

Instruction for handling biological material at BiO
Instruction for handling risk- and special waste
Infection defence at UiO
Instructions in the event of fire
How to handle medical emergencies at BiO
Vaccination – Short info in English from HMS

International guidelines

In addition, some more general resources on Biosafety have been made available at taskenarea/#Biosafety. These are international guidelines on how to maintain biosafety when working with biological specimens:

CLSI_H18-A3 (2004)_Procedures for the Handling and Processing of Blood Specimens

CLSI_M29-A3E (2005)_Protection of Laboratory Workers from Occupationally Acquired Infections

NIH (1999)_Biosafety in Microbiological and Biomedical Laboratories (BMBL) 4th Edition

WHO (2004)_Laboratory Biosafety Manual

“This is what we have all been waiting for; a short collection of recipes for how to please your colleagues in virtually no time at all! In a to-the-point wording and no-nonsense style the author has created a truly useful guide to the dos and don’ts in any scientific environment. Of great value as an everyday reference – this edition of ‘Recipes for a happy colleague’ will be your unfailing companion and steadfast friend in the lab.”

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