

# Introduction to the Fly Facility

If you are new to Genetics and would like to use the Fly Facility please email [flyadmin@gen.cam.ac.uk](mailto:flyadmin@gen.cam.ac.uk) to arrange an induction. In advance of this we ask you to read the appropriate safety documentation and our [Welcome page](#) and this document, [Introduction to the Fly Facility](#), which explain the rules for using the facility.

Risk assessments and standard operating procedures (SOPs) are in the Safety folder on the desktop of the fly lab iMac or you can download them from [CamTools](#). If any of your work is not covered by these risk assessments please write your own.

Please complete and sign the form at the end of this document and forward it to [flyadmin@gen.cam.ac.uk](mailto:flyadmin@gen.cam.ac.uk), to confirm that you have read and understood the fly lab rules and the risk assessments.

## The lab

Hint: We have a policy of discarding old flies without consultation, so if you ignore everything else in this Introduction please be sure to read the Rules for fly culturing!

- All fly handling in the department is carried out in the fly lab, which is situated in room 115 on the first floor. There are four constant temperature (CT) rooms and a micro-injection room within the fly lab: CT 2 and CT 3 at 18°, CT 1 and CT 4 at 25°; all have 65-75% humidity; the micro-injection room also houses a fluorescence microscope and camera.
- The CT rooms have pullout double-depth shelves on one side and single-depth fixed shelves on the other. (Take care when using the pullout shelves, if they stick try lifting them gently.)
- There are 24 workstations in the fly lab, each with its own dissecting 'scope. The lab is a communal resource and all workstations are available for use when vacant.
- Most scopes have a cold light source, but for those with a hot source ensure that the heat filter is in place. Two microscopes in the lab are attached to cameras, one colour, one b&w. The latter uses Leica software and may require a dongle for full operation.
- The lab is often very busy; it is therefore essential to **clean the bench and microscope and surrounding area** (including underneath equipment) with alcohol or bench spray after every use and leave the workstations clean and free of flies, media, equipment and rubbish. Clean up spills and broken glass. Microscope lenses can be cleaned with alcohol and lens tissue (not Kleenex). Boxes of lens tissues are located at the end of each bench.
- Please keep your own set of fly-pushing tools: brush, funnel, marker pen, etc.

## Noise

- Fly pushing can be a noisy occupation if done incorrectly. If 24 people were banging vials and bottles on the bench the lab would become a very unattractive place to work. Banging also causes the media to fall out and the flies to stick to the media and it damages microscopes and light boxes. Please ask to be shown **noise-free** fly-handling techniques.

Hint: rather than transferring your flies directly from a culture bottle to the CO<sub>2</sub> plate it is quicker and quieter to knock them into a clean plastic tube first (using a funnel) and then inject CO<sub>2</sub> into this tube before tipping the unconscious flies onto the pad.

Hint: consider knocking the fly container gently on your knee or tapping with your finger rather than on the bench.

## CO<sub>2</sub>

- CO<sub>2</sub> is stored in large cylinders in a shed outside the department. The gas pressure is regulated to a safe working pressure and piped to the lab where the pressure is further reduced in the lab by a control valve, situated by the window behind the media storage cupboards.
- If you are the last person to leave the lab in the evening please turn the black tap off. Similarly you will need to turn it on if you are first to arrive in the morning.

OFF: turn the black tap 1/4 turn clockwise (tap will be at right angles to the pipe)

ON: turn the black tap 1/4 turn anti-clockwise (tap will be in line with the pipe)

**Do not touch the yellow pressure regulator (diaphragm valve).**

- There are two CO<sub>2</sub> alarm panels near the door. The upper one sounds an alarm and shows a red light if one of the banks of cylinders is empty. Please mute the alarm and inform a member of the fly facility. The lower one sounds an alarm if the level of CO<sub>2</sub> in the lab is higher than normal. In this case open a window, turn the black control tap off and leave the lab. Inform a member of staff.
- The CO<sub>2</sub> pads are made of porous polythene stuck into Perspex blocks. This membrane is easily crushed, so try not to bang tubes or bottles on the surface. We have a supply of blanks cut to fit the blocks, so you can replace them when necessary (**smooth side up**).
- Every workstation has its own gas control tap. Keep the gas flow to a minimum at all times; the pads are efficient and a **very** low flow is sufficient to keep the flies asleep. Once you have knocked the flies out turn the flow down to the minimum necessary to stop the flies walking away. (Flies dehydrate and die more quickly if the gas flow is high.) **Please remember to turn your CO<sub>2</sub> off when not in use.**
- The bubblers are essential to prevent your flies from becoming dehydrated when anaesthetised. Check them regularly to ensure that they are working efficiently and do not leak. Ensure the rubber bung is pushed fully in, replace parts and refill with water as necessary.

## Natural gas.

- There are 2 natural-gas taps at the window-end of each bench. The taps are spring-loaded; when you have finished using gas check that they are turned off properly. If in doubt turn the isolation valve off, which is located beneath the window in the first bay as you enter the lab.

## Morgues

- Morgues simply consist of a bottle of alcohol with a funnel. When necessary flush the contents down the sink with plenty of water. Clean the funnel and the sink. Refill the bottle with a little alcohol from the yellow flammables cupboard.

## Media

- Media can be requested 24 hours in advance via the website <http://www.cam.ac.uk/~icc20/media>. You will need an @cam.ac.uk email address and a Raven password to access the website, see <http://raven.cam.ac.uk>. If you do not have a local email address please ask a colleague in your group to order media for you.
- The media technicians prepare media between 8 am and 11 am Monday to Friday. When it has cooled and dried they plug the media, seal it in plastic bags and deliver it to the media cupboards in the fly lab by late afternoon.

## Media Storage

- The blue cupboards at the near end of the fly lab are used for storing media. Please keep your media in sealed poly bags, labelled with your name and the date of preparation. Do not store it for longer than 7 days. Old or unlabelled media will be discarded after 10 days.
- Please do not store media in the CT rooms, particularly on the floor where mites lurk.
- If you want to store media for longer periods (up to 3 weeks) there is a 4° room in the basement (B6). Media will dehydrate rapidly at 4° unless sealed in poly bags. Label media with your name and the date on which it was prepared.

**Hint:** You cannot use fly media at 4° - flies are paralysed at low temp and stick to the surface of the media - allow the media to warm up at room temperature for 3-4 hours.

## READ THIS SECTION!!

### Rules for fly culturing

- Please label all fly cultures clearly so that we can easily identify the **owner** and the **date** of the oldest cultures in the tray.

**Hint:** When transferring flies from 18° to 25° or 25° to 18° it would be helpful if you noted the date of transfer on the label at the front of the tray.

- Each week we inspect the CT rooms. If we discover trays of flies in which there are old cultures or trays that are not properly labelled, the whole tray will be removed to the **SIN BIN** trolley (next to the fume hood at the back of the fly lab). Your flies will remain there for 3 days and will then be discarded. Do not move flies from the sin bin back into the CT rooms without first checking them for mites and mould and transferring them to new media.

**Hints:** Transfer stocks to clean trays, never re-use them. Stack used trays on the trolleys provided. Do not store flies on the CT room floors, always use the shelves - mites love floors.

- 25° stocks should be transferred and the old cultures discarded every 2 weeks. It may be desirable to keep cultures for a little longer (e.g. when collecting virgins, scoring crosses, screens, etc.), but generally flies cease to emerge from most cultures after 16-18 days. In exceptional circumstances cultures may be kept for 20 days. **But note: all cultures exceeding 20 days old will be moved to the sin bin**
- 18° stocks should be transferred every 4-5 weeks. Again it may occasionally be necessary to keep cultures for longer but generally flies have ceased to emerge from 18° cultures after 35 days. In exceptional circumstances they may be kept for 40 days. **Note: all cultures exceeding 40 days old will be moved to the sin bin.**

## Discards

- Discard-trolleys are kept in the Fly Lab and are collected by the glassware cleaners at regular intervals. Place used tubes in the top, bottles in the bottom.

## Mites

- All stocks should be checked regularly for mites, mould and other contaminants. If you do not know what mites look like:
  - 1) ask somebody
  - 2) see the photos on the fly lab notice board (not actual size),
  - 3) read the chapter on Parasites, Pests and Diseases in the Ashburner volume: A Laboratory Handbook (p1285),
  - 4) go to the Bloomington Stock Center website:  
[http://flystocks.bio.indiana.edu/Fly\\_Work/culturing.htm](http://flystocks.bio.indiana.edu/Fly_Work/culturing.htm)

## What to do if you find mites in your lab stocks

- Tell a member of the fly facility or send an email to [flyadmin@gen.cam.ac.uk](mailto:flyadmin@gen.cam.ac.uk).
- Discard all non-essential stocks.
- Mop all potentially mitey surfaces (including the CT room shelves) with alcohol.
- If your stocks are badly affected move them to the isolation room, select 5-10 pairs of clean adults (check them for mites and mite eggs) to set up a new culture; transfer the adults 3 times, once every 2-3 days, discard the first 2 transfers; continue to check the stock for at least 2 generations.
- For less affected stocks: rapid transfer, transfer adults to new vials every 2 days, at least 3 times. Discard the early transfers.

## Quarantine (download the document “Mites and Quarantine” from the website)

- If you bring new stocks into the department from whatever source they must be quarantined in the isolation area in the attic (tel 33997) for a minimum of 2 ‘clean’ generations. **Please do not attempt to shortcut this procedure.**

## Mutagenesis

- Chemical mutagenesis can be carried out in the fume hood in the fly lab. Please ask for a protocol. **Note: EMS is highly carcinogenic.**
- The Torrex X-ray machine is situated in the basement. Do not use it without training.

## Cage room

- There is an embryo collection facility in the basement (room B14a). If you wish to use this facility please discuss your requirements with Hayden McDermott beforehand (tel 33970, email [hm265@cam.ac.uk](mailto:hm265@cam.ac.uk)).

## Allergies

- A very small number of people who are exposed to *Drosophila* develop allergies. Consequently soon after you start working in the fly lab you will receive a letter from the Occupational Health Service (OHS) asking you to attend a health screening appointment with a nurse. The appointment will be brief and completely non-invasive. You will be asked to fill-in a questionnaire and blow into a tube.
- Please inform us if you have an existing allergy that might predispose you to a fly allergy. If you are concerned that you are developing symptoms contact OHS (Tel: 36594) who will monitor you and advise accordingly. Protective clothing including masks (FFP1 and FFP2) and gloves are available in the fly lab. Please inform us of your requirements.

## Risk Assessments and SOPs

- Risk assessments and SOPs relevant to fly workers are kept in the Safety box-file (purple) in the fly lab and can also be found in the Safety folder on the desktop of the fly lab iMac. If any of your work is not covered by these risk assessments please write your own.
- Please read whichever are appropriate for your work. If you are using, or intend to use, techniques that are not covered by this list you **MUST** write your own risk assessment.

## Posture

- See: <http://www.microscopyu.com/articles/ergonomics/ergointro.html>, <http://www.working-well.org/articles/archive.html#lab> and other articles from <http://www.working-well.org/>
- If you use a microscope for a "significant part of your working day" please read these documents. Also please read the recommendations for VDU use in the department safety handbook. Printouts of all these documents can be found in the fly lab SAFETY box file.
- If you have any problems which you think are related to microscope or vdu use do not hesitate to tell your group leader or JR.

## Fly stock lists

- Our core collection of stocks is available free to Cambridge flypushers. The list can be downloaded from the fly facility website. Some fly groups have published their stock lists on the fly lab Mac in the desktop folder 'current stock lists'. Please put **your** stock list here too.

## ..and finally

- If you are new to fly work or need help or advice please feel free to ask one of the fly facility technicians.
- See the website Welcome page for a full list of fly books available for loan. "Fly Pushing. The Theory and Practice of *Drosophila* Genetics" by Ralph Greenspan is a good introduction to flies. "Getting Started" chapter 2 of *Dros. Methods and Protocols*, edited by Christian Dahmann, is an excellent primer for fly virgins.
- The Bloomington web pages <http://flystocks.bio.indiana.edu> provide much useful information for beginners and old hands alike.

## New users of the fly lab

Now please fill in this form and return it to flyadmin@gen.cam.ac.uk. Don't forget to add 'Fly Facility induction' to your Personal Safety Training Record.

NAME.....

EMAIL.....

GROUP LEADER.....

SUPERVISOR.....

POSITION (technician, RA, PhD student, postdoc, etc.).....

Please estimate how many hours per week you expect to spend in the fly lab:.....

Please state approx. when your employment or studentship expires:.....

Are you aware of having any respiratory or dermatological allergies? Y/N.....

Please sign to confirm:

- (i) I have read and understood the fly lab and quarantine rules
- (ii) I know where the fly lab risk assessments are located
- (iii) I have read and understood the fly lab risk assessments.

Signed:.....

Date:.....

Thank you.

Email to flyadmin@gen.cam.ac.uk

JR  
Oct12