

Induction for Physics of Medicine Building**Welcome to the Physics of Medicine building (PoM)...**

- The Physics of Medicine Building contains a range of laboratory spaces including CL3, CL2, CL1 and biologically undesignated laboratory areas. You must work in an area suitable for your experimental work.
- All work must be risk assessed BEFORE starting.
- All POM lab announcements should be made to pom-daytoday@lists.cam.ac.uk. Please subscribe to this email list at <https://lists.cam.ac.uk/mailman/listinfo/pom-daytoday> .
- The latest version of this booklet is made available online in: <https://www.bss.phy.cam.ac.uk/internal/forms/> . Please bookmark this link on your computer.
- If you are working between the hours of 7pm-8am or at weekends, ALWAYS sign into the electronic sign-in facility, located on the ground floor near the lift. This is to help fire fighters find you in an emergency. The record is automatically wiped each morning. You can sign in and register at: <http://lw1.cta.phy.private.cam.ac.uk/ooh/>. You MUST LOG OUT of the out of hours working system when you leave.
- A number of doors in POM have had Dorgards fitted. These allow a door to be held open, but will automatically release the door if the fire alarm sounds, slowing the spread of any potential fire. If you need to leave a POM door open, use the Dorgard (a red panel at the bottom of the door) to peg the door back. If there is no Dorgard or it is not working, contact Tim Fitzmaurice. **Do not leave any POM doors propped open with chairs - this is a fire risk.**
- There is a 'No laboratory gloves on doors' policy in PoM. Users found violating this policy will have their access to PoM removed.
- Toilets are located in the middle of the ground and first floor corridors, outside the laboratories.
- Eye wash facilities (the yellow plastic capped hose) are located next to every hand wash basin.
- First aid kits are located in Room 0.10 (Mechanics Lab), Room 1.08 (Chemistry Lab) and on the ground floor opposite the front entrance. If you use any items, you must notify the Laboratory Manager (Tim Fitzmaurice).
- Everyone must attend the Departmental H&S general induction. Please also sign up for the following health and safety courses at <https://www.phy.cam.ac.uk/intranet/hands/training2> , if relevant to your work:
 - ✚ Pressurised Gases and Cryogenics
 - ✚ Chemical Safety
 - ✚ Nanoparticle Safety
 - ✚ Laser Safety for Class 3B and 4 Laser Users
 - ✚ Using Containment Facilities and Microbiological Safety Cabinets

- All users must comply with all signs and written instructions! This is essential to keep you, your colleagues, contractors and the equipment safe. Disregard for lab rules and equipment instructions will result in removal of access to PoM.
- Switch off lights and equipment when not in use, unless there are instructions stating not to.
- All overnight/weekend experiments **MUST** be clearly labelled with your name, an experiment description, the length of time the experiment will run for and your out of hours contact details. If there is a problem, security staff will contact you and ask for instructions.
- **All** PoM users must reorder consumables if they are running low in a communal area. The order form address is: <https://www.bss.phy.cam.ac.uk/internal/neworder> .
- If you are working in any laboratory where hazardous chemicals or biological agents are in use you must wear a lab coat. Clean lab coats are available from all laboratories.
- Do not remove pipettes or reagents from lab benches without checking that they are communal! Please return communal items to their location afterwards.
- Do not use any piece of equipment without training.
- If you are not affiliated with BSS and also require access to a computer in POM, you will need to be registered with an account. Contact Will Alcock (wja28@cam.ac.uk) for further details.
- If you have a question **and the answer is not in this booklet**, please ask one of the people listed below.

Important Contact Details

Tim Fitzmaurice (Laboratory Manager & Biological Safety Officer): 748914 | 07722 163970 (mobile) | tjf11@cam.ac.uk | Office: Room 1.04, POM building

Saba Alai (Departmental Safety Officer): 37397 | 07817602858 (mobile) | sa792@cam | Office: Room 250, Bragg building

Anya Howe (Chemical Safety Officer & Research Support): 37397 | 07834319547 (mobile) | ajh246@cam | Office: Room 251, Bragg building

Administrators: 37478 | Room 988 & 989, Rutherford Building | rutherford.hub@phy.cam

Will Alcock (Computing Officer): 37012 | Room 906, Rutherford Building | wja28@cam

Facilities (e.g. maintenance, heating, lighting issues) | facilities.helpdesk@phy.cam

Card access: access@phy.cam

Graham Jack (BOC cylinder operative) | 65309 | Mobile: 07768558722 | jack.graham@boc.com

OUT OF HOURS WORK

Normal working hours are from 8am to 7pm on week days. Any time out of these hours, at weekends or bank holidays is officially 'out of hours'.









1. Users must sign in and out of the Out of Hours working system as described above.
2. High risk lab work (such as work with piranha solution) is only permitted between 8:30 and 16:45, with a buddy (CORE HOURS).
3. If carrying out lab work of medium risk e.g. work with hazardous chemicals, biologicals, gases or cryogenics, you must work with a buddy close enough in the lab to hear you and help you if there is a problem.
4. When working in pairs ("buddy" system) each worker must be aware of what the other person is working with or on and, importantly what to do if there is an accident. If the "buddy" is working out of sight then arrange to check on each other regularly - say every 15 minutes. Arrange to have a "buddy" **before** you start work. If out of hours, on arrival if you notice others are already signed IN as out of hours working, then go and inform them of your arrival/presence. If finishing the medium or high risk experiment and/or leaving the laboratory, inform the other. If there are only two persons working then inform the "buddy" of your intention to leave well before you go. This will enable the "buddy" to complete or leave his/her work in a safe state. Both of you should leave together.
5. Lone working in the PoM laboratory is acceptable only if the activity is quantified to be 'low risk', by formal risk assessment. You must have a copy of the risk assessment available for inspection. You must inform a colleague or the Lab Manager when you plan to work alone out of hours, inform them what you are working with and your location. Additionally, make sure you inform them when you leave the lab. This is departmental policy.

These rules are for your protection. Please follow them.

WASTE DISPOSAL IN POM

Hazardous Chemical Waste Disposal

Chemical waste is considered to be hazardous, if it contains chemicals classified as:

-  Toxic
-  Corrosive
-  Irritants
-  Harmful
-  Carcinogenic
-  Prescription only medicine
-  Flammable liquids with a flash point $\leq 60^{\circ}\text{C}$ (i.e. organic solvents)
-  Oils

You **MUST** carry out a (or read the relevant) hazardous substance risk assessment **BEFORE** you use any chemicals in PoM.

Hazardous chemical waste of different types must be handled and then stored separately. This is to prevent adverse or unexpected chemical reactions.

Disposal via the Drains

The drains are not meant for disposal of waste chemicals. Most waste chemicals will damage the waterways and the Department may be prosecuted by the Environment Agency.

However, the following can be disposed of to the drains with large volumes of water:

- Aqueous solutions containing less than 0.01% organic solvents (excluding chlorinated solvents)
- Dilute acid, alkali or ammonia solutions
- Harmless soluble inorganic salts (including CaCl_2 , MgSO_4 , NaSO_4 , P_2O_5)
- Hypochlorite solutions
- Bleach and other household cleaning agents in small amounts

For all other hazardous chemical waste, including glass or consumables that are significantly contaminated with hazardous chemicals, refer to table on pp6-7.

For any queries about Chemical Waste, please see the Laboratory Manager (Tim Fitzmaurice) or the Chemical Safety Officer (Anya Howe). Contact details are in this document.

Biohazardous Waste Disposal

- **Solid biohazardous waste** - double bag and autoclave before disposing into the blue bins in room 1.22. Before autoclaving, store biohazardous waste in the grey bins labelled 'Un-Autoclaved Waste Only' in room 1.22.
- **Liquid biohazardous waste** - inactivate by adding Virkon to a 2% concentration and leave for a minimum of 10 minutes, before disposing down the sink with large volumes of water.
- **Biohazard contaminated gloves** - put in the grey bins labelled 'Contaminated Gloves Only' in the Cell Culture Facility.
- **Biohazard contaminated serological pipettes and pipette tips** - put in the white Bio-bins. When full, close the bin, add autoclave tape and place in the grey bins labelled 'Un-Autoclaved Waste Only' in room 1.22.
- **Biohazard contaminated needles, sharps and broken glass** – Can go straight into the sharps bins. Large quantities of biohazardous broken glass must be autoclaved before disposal in the glass bin. Ask Tim Fitzmaurice (tjf11@cam.ac.uk) for advice if unsure.
- **Used STARLAB pipette tip boxes and wafers** - put in the grey bin labelled 'Contaminated STARLAB pipette tip boxes and wafers' in room 1.22. They will then be autoclaved before recycling.

Non-hazardous Laboratory Waste

You can put the following in the blue bins, unless significantly contaminated with hazardous chemicals:

- Gloves, rinsed plastic-ware, paper towels/tissues, agarose etc.

Cardboard and polystyrene boxes

Ground floor labs: Leave in Mechanics lab, in the plastic tray under the bench nearest the entrance to the corridor.

First floor labs: Leave in the Biochemistry Lab, in the plastic tray under the middle bench holding the drying oven. If large amounts of cardboard need disposing of, please take to the recycling bins outside.

Collection of empty glass Winchester bottles

Ground floor labs: Leave in the wire bottle carrier racks in the Goods In room (room 0.02)

First floor labs: Leave in the wire bottle carrier racks in the Chemical Store (room 1.30)

These will be collected every month and taken to the Chemical Waste Store.

Useful Links:

BSS Equipment list: <https://www.bss.phy.cam.ac.uk/internal/bssequipment>

POM Equipment Booking: <http://people.bss.phy.cam.ac.uk/interactive/equipment>

Physics Department Health, Safety and Environment website:

<https://www.phy.cam.ac.uk/intranet/hands>

Physics Department Health, Biological work webpages:

http://www.phy.cam.ac.uk/internal_resources/hands/hazards/biology

Physics Stores online catalogue:

https://www.phy.cam.ac.uk/intranet/services/stores/Stores_CATALOGUE_Feb16.pdf

Biological Safety Induction and Human Tissue Act Training

If you are planning to work with malaria, blood, bacteria, algae or mammalian cells or plan to introduce any other novel biological material, please email Biological Safety Officer Tim Fitzmaurice (tjf11@cam.ac.uk) to arrange an induction.

Additionally, if you are planning to carry out any work with material containing human cells that have not divided outside of the human body (e.g. teeth, hair, saliva), this will fall under the Human Tissue Act. You will need to undergo specialist training to work with human tissue.

| Equipment/ Laboratory | Contact | Location |
|--|---|-------------------------------|
| Laser Writer | Eileen Nugent | Mott 419A |
| Zeiss upright microscope | Eileen Nugent | Mott 419A |
| Liquid nitrogen dispenser | Tim Fitzmaurice | Goods In, POM 0.02 |
| Sonicator | Alessio Caciagli | Shaker Room, POM 0.04 |
| 3D printers | Ulrich Keyser | Mechanics Lab, POM 0.10 |
| Pipette pullers (model P-2000) | Ulrich Keyser | Mechanics Lab, POM 0.10 |
| Electrophysiology measurement systems | Ulrich Keyser | Nanopore Lab, POM 0.11 |
| FTA 200 Dynamic Contact Angle Analyzer | Pietro Cicuta | Physics Lab, POM 0.12 |
| 0.26 Microscope | Pietro Cicuta / Erika Eiser | Laser Tweezers Room, POM 0.26 |
| 0.26 Tweezers | Pietro Cicuta / Erika Eiser | Laser Tweezers Room, POM 0.26 |

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| Hyperspectral Imaging Evaluation System | Sarah Bohndiek | Hyperspectral Lab, POM 0.28 |
| IX73 2-Deck Inverted Microscope | Otti Croze | Microbial Swimming & Ecology Imaging Room, POM 0.33 |
| Zeiss LM510 | Lorenzo Di Michele | Leica Confocal Room, POM 0.36 |
| Leica TCS SP5 confocal microscope | Lorenzo Di Michele | Leica Confocal Room, POM 0.36 |
| Electrophysiology measurement systems | Ulrich Keyser | Nanopore Lab, POM 0.11 |
| FTA 200 Dynamic Contact Angle Analyzer | Pietro Cicuta | Physics Lab, POM 0.12 |
| 0.26 Microscope | Pietro Cicuta / Erika Eiser | Laser Tweezers Room, POM 0.26 |
| Multitron-Pro Package Incubators | Otti Croze | Algae Lab, POM 1.06 |
| New Brunswick BIOFLO 110 fermentor/ bioreactor | Tim Fitzmaurice | Algae Lab, POM 1.06 |
| Z2 Dual Threshold Cell Counter | Otti Croze | Algae Lab, POM 1.06 |
| E.M.S. Spin coater model 4000 | Omar Amjad | Chemistry Lab, POM 1.08 |
| Rotary evaporator | Tom O'Neill | Chemistry Lab, POM 1.08 |
| Differential scanning calorimetry machine | Eugene Terentjev | Biochemistry Lab, POM 1.10 |
| GelDoc imaging system | Lorenzo Di Michele | Biochemistry Lab, POM 1.10 |
| Nanodrop | Lorenzo Di Michele | Biochemistry Lab, POM 1.10 |
| Centrifuge | Tim Fitzmaurice | Biochemistry Lab, POM 1.10 |
| pH meter | Alex Ohmann | Biochemistry Lab, POM 1.10 |
| Thermal cycler TC512 | Lorenzo Di Michele | Biochemistry Lab, POM 1.10 |
| -80°C freezer | Tim Fitzmaurice | Cell Culture Preparation Lab, POM 1.16 |
| Microbiological safety cabinets | Tim Fitzmaurice | Cell Culture Lab, POM 1.18 |
| Motic inverted fluorescent microscope | Tim Fitzmaurice | Cell Culture Lab, POM 1.18 |
| -80°C freezer | Tim Fitzmaurice | Bacteria Lab 2, POM 1.20 |
| Static incubators | Tim Fitzmaurice | Bacteria Lab 2, POM 1.20 |
| Waterbath | Tim Fitzmaurice | Bacteria Lab 2, POM 1.20 |
| Centrifuge | Tim Fitzmaurice | Bacteria Lab 2, POM 1.20 |
| Ice machine | Tim Fitzmaurice | Autoclave Room, POM 1.22 |
| Autoclave for sterilisation | Tim Fitzmaurice | Autoclave Room, POM 1.22 |
| Waste autoclave | Tim Fitzmaurice | Autoclave Room, POM 1.22 |
| Microbiological safety cabinet | Tim Fitzmaurice | Bacteria Lab 1, POM 1.24 |
| Shaking incubators | Tim Fitzmaurice | Bacteria Lab 1, POM 1.24 |
| FTIR spectrometer | Eugene Terentjev | Instrument Lab, POM 1.28 |
| DMA machine | John Gearing | Instrument Lab, POM 1.28 |
| Fluorescence spectrophotometer | Jehangir Cama | Instrument Lab, POM 1.28 |
| BMG Labtech FLUOstar OMEGA microplate reader | Tim Fitzmaurice | Instrument Lab, POM 1.28 |
| UV-Vis spectrophotometers | Jehangir Cama | Instrument Lab, POM 1.28 |

| Waste Stream | What it includes | What to do | Where does it go? |
|--------------------------|--|---|----------------------|
| Lab Smalls | Waste commercial chemical bottles (or anything not included below) | Take a blue chemical waste box from the waste store. Complete Waste Form and email to the Chemical Safety Officer (CSO) for approval and forwarding to contractor. Place bottles into chemical waste box along with a copy of the Waste Form. Place box in chemical waste store. | Chemical Waste Store |
| Solvent Waste | Chlorinated and non-chlorinated Solvents | Keep these in separate plastic bottles, labelling each bottle with a supplied chemical waste sticker and place in solvent waste storage area. Do not include on Waste Form. Kept in room 1.08 Chemistry Lab. | |
| Acid Waste | Waste acid solutions | Small amounts: dilute to less than 10% v/v. ALWAYS ADD ACID TO WATER NOT THE OTHER WAY ROUND. WEARING FULL PPE (gloves, lab coat, face shield or goggles), carefully pour diluted acid to drain in lab, while tap is running. Run tap for a few minutes after. Large amounts (inc. commercial bottles): Treat as Lab Smalls above. | |
| Solid Waste | Silica, drying agents Etc. | Store in a plastic container. Seal and label with type of solid waste, Group and producer name or CRSid. Container will be disposed of by waste contractor. | |
| Contaminated Consumables | Gloves, tissues and plastic waste contaminated with heavy metals, nanoparticles or highly toxic material | Bag up and label with type of waste and group name. This should then be treated as Lab Smalls above. | |
| Sharps Waste | Metal sharps inc:- needles with syringes (glass syringe can be separated if safe to do so), scalpels and blades | Place into sharps boxes. When box is full completely seal the lid. Cover biological hazard sign with the supplied 'Chemical Sharps' sticker and label with group name. Take to the Chemical Waste Store. Container will be disposed of by waste contractor. | |
| Glass Waste | Any laboratory glass item (including broken glass) – does not include | Place in white waste tub for glass. Keep lid on tub when not in use. | |

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| | normal drinking glasses/bottles | | |
| Empty Glass Winchesters | Clean empty chemical bottles and Winchesters | Clean all chemical bottles (if in doubt, ask the CSO), deface or rip off the label and place in mixed recycling. DO NOT PUT WASHINGS DOWN THE DRAIN. Empty Fisher Winchesters should be placed in empty Fisher cardboard box. | |
| Uncontaminated Consumables | Gloves, Tissues and Plastic waste Etc. | Bag up and place in domestic waste. This can be in a normal bin bag. But ensure it is sealed before cleaners arrive. Alternatively take to waste bins in the loading bay. | Cleaner pick up or take to domestic waste skip. |

If in doubt: Contact the Chemical Safety Officer (CSO), Anya Howe; Email ajh246@cam.ac.uk, Tel: 37421, Mobile: 07834 319547

POM Laboratory Information

| Room | Person Responsible | Equipment | Significant Hazards |
|---|--|---|----------------------------------|
| 0.02 Goods In | N/A | Liquid nitrogen dispenser Delivered goods are left here. | Asphyxiation, cryogenics |
| 0.04 Shaker Room | Erika Eiser (ee247@cam.ac.uk) | Sonicator, MCR501 Modular Compact Rheometer | Noise |
| 0.06 Hub Room | N/A | | |
| 0.08 Controlled Molecular Transport Lab | Ulrich Keyser (ufk20@cam.ac.uk) | | Lasers, asphyxiation |
| 0.10 Mechanics Lab | Ulrich Keyser (ufk20@cam.ac.uk) | 3-D printers, dissection microscope, Visco Analyser V4000, plasma cleaner, micropipette puller, PDMS balances and dessicators First aid box: next to the hand basin. | Chemicals, sharps |
| 0.11 Nanopore Lab | Ulrich Keyser (ufk20@cam.ac.uk) | Tecella Triton+ 16 channel electrophysiology measurement system | |
| 0.12 Physics Lab | Pietro Cicuta (pc245@cam.ac.uk) | Fume hoods, dissection microscope, FTA 200 Dynamic Contact Angle Analyzer, various microscopes | Chemicals |
| 0.13 Olympus Microscope Room | Arijit Das (akd41@cam.ac.uk) | FV1200 Olympus confocal microscope | Lasers, asphyxiation, biohazard |
| 0.14 Malaria Lab | Pietro Cicuta (pc245@cam.ac.uk) | Biological safety cabinet, incubator, microscope, centrifuge, liquid nitrogen culture storage dewar | Asphyxiation, cryogen, biohazard |
| 0.16 Microscopy Lab | Sarah Bohndiek (seb53@cam.ac.uk) | | Lasers |
| 0.24 Laser Interface Scattering Room | Pietro Cicuta (pc245@cam.ac.uk) | | Lasers |
| 0.26 Laser Tweezers Room | Pietro Cicuta (pc245@cam.ac.uk) / Erika Eiser (ee247@cam.ac.uk) | Two Nikon Ti-E inverted microscopes | Asphyxiation, biohazard |
| 0.28 Hyperspectral Labs | Sarah Bohndiek (seb53@cam.ac.uk) | Hyperspectral Imaging Evaluation System | Lasers, biohazard |
| 0.30 Cell Mechanics Lab | Ulrich Keyser (ufk20@cam.ac.uk) | FV1200 Laser scanning microscope, Eclipse TE2000U microscope | Lasers, biohazard |
| 0.31 Cilia Lab | Pietro Cicuta (pc245@cam.ac.uk) | | |

| Room | Person Responsible | Equipment | Significant Hazards |
|--|---|---|--|
| 0.32 Laser Scattering Room | Eugene Terentjev (emt1000@cam.ac.uk) | | Lasers |
| 0.33 Microbial Swimming & Ecology Imaging Room | Otti Croze (oac24@cam.ac.uk) | IX73 inverted microscope | Lasers, biohazard |
| 0.34 Atomic Force Microscope | Pietro Cicuta (pc245@cam.ac.uk) | Nikon Ti-E inverted microscope | Lasers, biohazard |
| 0.35 Optics Lab | Sarah Bohndiek (seb53@cam.ac.uk) | WITEC raman and fluorescence microscope | Lasers, asphyxiation, biohazard |
| 0.36 Leica Confocal Room | Lorenzo Di Michele (ld389@cam.ac.uk) | Leica confocal microscope, Zeiss LM510 | Lasers, asphyxiation, biohazard |
| 1.02 Office | | Lab write up area | |
| 1.04 Office | Tim Fitzmaurice (tjf11@cam.ac.uk) | | |
| 1.06 Algae Lab | Otti Croze (oac24@cam.ac.uk) | Laminar flow cabinet, centrifuge, shaking incubator, Beckman Coulter Counter Z series | Chemicals, biohazard |
| 1.08 Chemistry Lab | Eugene Terentjev (emt1000@cam.ac.uk) | Fumehoods, electrospinner, balances, glassware oven, spin coater, rotary evaporator This lab's glassware: in room 1.32. First aid box: on the bench next to handwash sink. Lab coats: on pegs next to handwash sink. | Chemicals; flammables, toxic, harmful, corrosive |
| 1.10 Biochemistry Lab | Tim Fitzmaurice (tjf11@cam.ac.uk) | Differential scanning calorimetry machine, millipore filtered water, magnetic stirrers / hotplates, vortex, ultrasonic baths, GelDoc Imaging system, fume hoods, glassware oven, pH meter, centrifuges, balances, drying oven, nanodrop, microwave This lab's glassware: in room 1.28. Clean lab coats: in cupboard beneath balances. | Chemicals, biohazard |

| Room | Person Responsible | Equipment | Significant Hazards |
|-----------------------------|--------------------------------------|--|--|
| | | Distribution points for syringes, tissues, gloves and glass vials for whole building. | |
| 1.12 Nucleic Acids Room | Ulrich Keyser (ufk20@cam.ac.uk) | PCR machines, laminar flow cabinet | Chemicals |
| 1.14 Bacteriophage Lab | Diana Fusco (df390@cam.ac.uk) | Incubator | Biohazard, asphyxiation |
| 1.16 Cell Culture Prep Room | Tim Fitzmaurice (tjf11@cam.ac.uk) | -80°C freezer, liquid nitrogen culture storage dewar | Asphyxiation, cryogen, biohazard |
| 1.18 Cell Culture Lab | Tim Fitzmaurice (tjf11@cam.ac.uk) | Biological safety cabinets, incubators, centrifuge, inverted fluorescence microscope Lab coats: in lobby outside the room. | Asphyxiation, biohazard |
| 1.20 Bacteria Lab 2 | Tim Fitzmaurice (tjf11@cam.ac.uk) | Centrifuge, water bath, -80°C freezer, incubators Non-sterile glassware for bacteria lab is stored here. | Biohazard |
| 1.22 Autoclave Room | Tim Fitzmaurice (tjf11@cam.ac.uk) | Ice machine, autoclaves, dishwasher | Biohazard, heat/steam from the autoclave |
| 1.24 Bacteria Lab 1 | Tim Fitzmaurice (tjf11@cam.ac.uk) | Biological safety cabinet, shaking incubators, centrifuge, microwave Sterile glassware for bacteria lab is stored here. | Biohazard |
| 1.28 Instrument Room | Tim Fitzmaurice (tjf11@cam.ac.uk) | FTIR machine, DMA machine, FLUOstar OMEGA plate reader, Cary 300 Bio UV VIS spectrophotometers, Cary Eclipse fluorimeter | Biohazard, asphyxiation |
| 1.30 Chemical Store | Eugene Terentjev (emt1000@cam.ac.uk) | Spare chemicals and equipment are stocked here; UV crosslinker, balances, Silverson L4R mixer, Hetofrig heater, Branson Sonifier 150, magnetic hotplate stirrer, signal generator. | Flammables, acids, toxic chemicals |
| 1.32 Glassware Store | Eugene Terentjev (emt1000@cam.ac.uk) | | Chemicals |