Agenda for the 15th meeting of the Biosafety Committee of the University of Hong Kong. (A sub-committee of the Safety Health and Environment Committee).

To be held on Thursday, October 8th 2015, 11.00 a.m. Room 412 at Professorial Block, Queen Mary Hospital.

1. Minutes of the 13th meeting of the Biosafety Committee (October 9th 2014)
The minutes of the previous physical meeting of the Biosafety Committee were circulated in March 2015 and members approved them by e-mail. For completeness they are attached as Appendix 1. Please note that this was incorrectly referred to as the 12th meeting on the circulated minutes, this detail has now been amended.

2. Matters arising from the minutes of the 13th meeting (action points etc.)
The secretary arranged for the minutes to be uploaded to the safety office website and circulated the guidance on BSL2 to relevant departments.

3. Introductory course in biosafety
The next introductory course in biological safety will be held on the 13th of October 2015. Around 20 students and staff had registered by the 25th of September. The slides used in a previous session have been uploaded to the Safety Office website and links to the courses four files can be found on http://www.safety.hku.hk/homepage/bio.html.

The secretary is keen to improve training and awareness of biological safety in the University. Committee member's views on how this might achieved would be welcome. Would making the course compulsory be desirable (or possible)?

4. Good Microbiological Practice
In an attempt to highlight several of the important aspects of biological safety we have recently amended the handling of clinical samples advice and provided some guidance on Biosafety Level 2. In a similar vein the document included as Appendix 2 is a summary of Good Microbiological Practice which is drawn primarily from documentation on the Lawrence Livermore National Laboratory, University of California. The basics of GMP are also written into the University Biological Safety policy but it is hoped the separate information provided here might be more useful for training and improving awareness of the importance of good techniques.

The secretary would welcome comment on the document particularly if members feel other material should be included. How should this material be made available?

5. FACS sorting of unfixed cells
At the 6th meeting of the Biosafety Committee in May 2010 the committee adopted the International Society for Analytical Cytology (ISAC) document [Schmidt et al (2007), Cytometry (A) 71(6):414-37] as University guidance on the fluorescent activated cell sorting (FACS) of unfixed materials. We also discussed this further at our May 2011 meeting because the Faculty of Medicine had recently established a core facility for FACS. ISAC has revised and updated the Standard. (Holmes et al (2014) Cytometry A.

85(5): 434–453. International Society for the Advancement of Cytometry Cell Sorter Biosafety Standards – Included as Appendix 3). The update provides guidance on: (1) laboratory design for cell sorter laboratories; (2) the creation of laboratory or instrument specific Standard Operating Procedures (SOP); and (3) procedures for the safe operation of cell sorters, including personal protective equipment (PPE) and validation of aerosol containment.

In part the new guidance has arisen because of a more thorough characterization of aerosols capable of being produced by cell sorters (Holmes KL. (2011) Characterization of aerosols produced by cell sorters and evaluation of containment. J Int Soc Anal Cytol; 79A:1000–1008 – see Appendix 4). Both papers are a valuable resource for those in HKU operating FACS machines.

As noted at our previous meeting the risks in HKU are currently mitigated to some extent by operating procedures and an aerosol management system that is attached to the FACS (for example see the pdf file attached). However because of difficulties with validation of the system and some concerns about maintenance most laboratories carrying out FACS of unfixed bloods now use a machine contained within a BSC or placed in a designated BSL3 facility. This becomes an absolute requirement when FACS is carried out on bloods containing BSL3 agents.

In summary to reduce risks of accidental infection, FACs of unfixed clinical samples is best conducted under containment. This might be a BSL3 facility but is now more commonly carried out in a bespoke Biosafety cabinet.

The committee is asked to approve this new standard as the University guidance on FACS of unfixed cells. If approved the secretary will arrange to replace the original standard with the new one on the Safety Office website and also include the paper on characterization of the aerosols generated by FACS. Should the committee encourage the purchase of FACS machines with bespoke containment arrangements?

6. Use of Formaldehyde

Recently the European Union has classified formaldehyde as a Category 1b carcinogen under the Classification, Labelling and Packaging (CLP) Regulation, which takes effect from January 2016. Appendix 5 is the summary of general advice given by the UK regulators (HSE) on what the regulation requires and what might be the consequences for the use of formaldehyde in the laboratory setting. It appears that its use may well be phased out within 3-5 years if suitable alternatives are found. As a consequence I have seen e-mails similar to the one below from a number of UK university biosafety personnel.

"We've a PI who would like to start working with TB in one of our CL3 labs. We're looking at moving away from formaldehyde (plus there are issues with the room needing >5 litres…) and I understand that the next best thing for TB is chlorine dioxide."

While it is unlikely that Hong Kong will ban the use of formaldehyde it might be worthwhile investigating alternatives. The paper attached as Appendix 6 (Comparison of multiple systems for laboratory whole room fumigation – Beswick et al (2011) Applied Biosafety: Journal of the American Biological Safety Association Volume 16, Number 3; 139-15) was part of the documentation for our October 2012 meeting and remains one of the few sources of direct comparisons of room decontamination methodologies.

The views of the committee are sought on whether the university should move away from using formaldehyde.

7. Dual Use Research of Concern (For Information and possible discussion)
All parties to the debate on dual use research of concern (DURC) acknowledge sustained fundamental and translational research is needed to understand the mechanisms of pathogenicity and transmission of various pathogens. Although this research is designed to develop new or improved vaccines, novel anti-infectives and diagnostics for the treatment and prevention of these diseases it may also have the potential for misuse, for example in developing biological weapons.

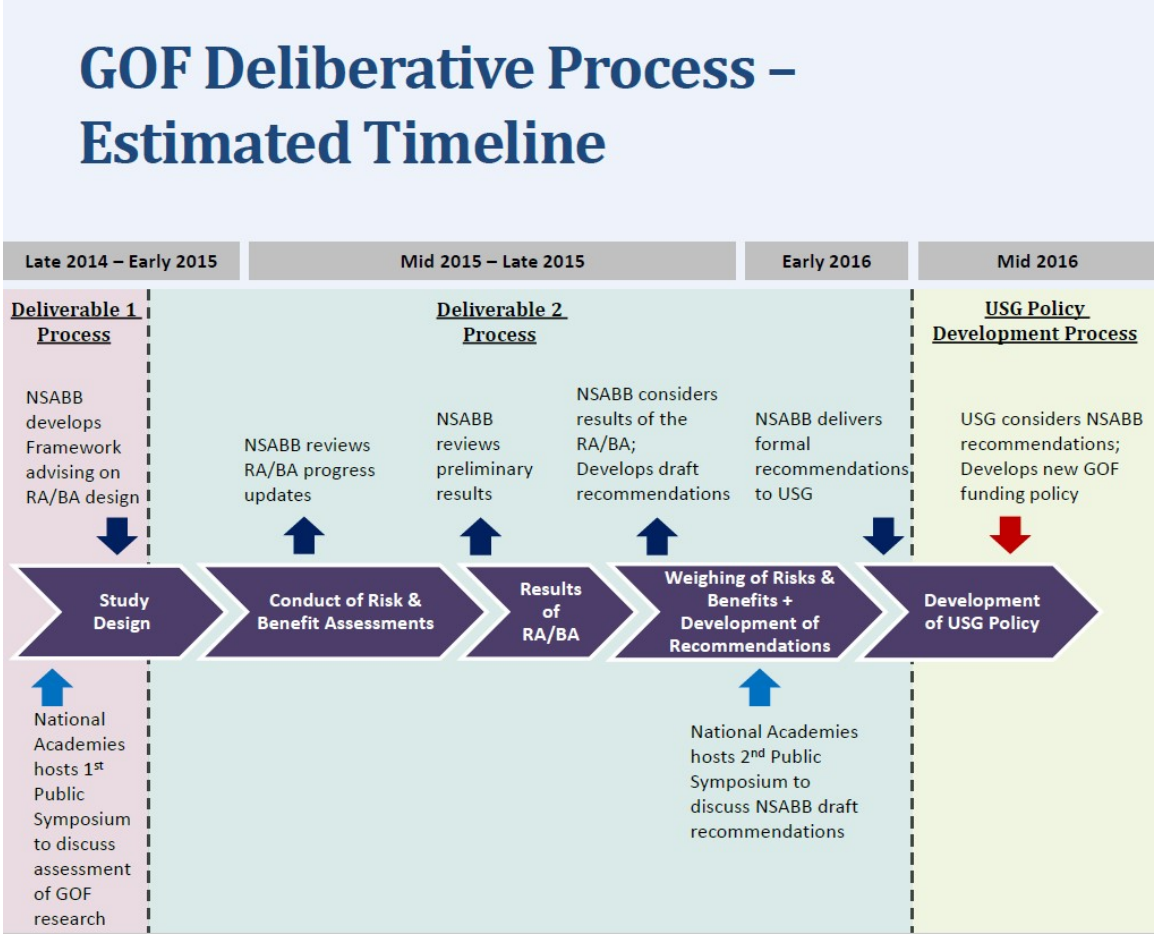
The US government has introduced a detailed and rigorous system of regulation for experiments considered to be dual use research of concern. Appendix 7 released in September 2014 outlines how the US government expect institutions to oversee this type of work. Because institutional oversight will be a new undertaking for many institutions, the US government is currently limiting the requirements in the policy, to research that focuses on a subset of life sciences research that involves 15 agents and toxins and seven categories of experiments (see section 6.2 of the US document). Interestingly SARS and MERS are not on the list of agents but are covered by the White House announced moratorium on gain of function experiments (see next item).

The regulations require organisations to develop policies, practices, and procedures to ensure DURC is identified and risk mitigation measures are put in place - where applicable. The organogram in section 7 of the document outlines the organizational framework for this oversight.

When last discussed the general consensus of the committee was that it was not so much a safety issue more an ethical one. Is that still members views? If so what would we recommend the University does? Should it monitor this type of work? If yes how might that be done?

8. Update on the Gain of Function moratorium (For Information)
According to NIH the US government embarked on a deliberative process to re-evaluate the potential risks and benefits associated with gain-of-function (GOF) research involving pathogens with pandemic potential because of biosafety incidents and renewed concerns regarding laboratory safety. They stated that new government funding would not be released for GOF research projects that may be reasonably anticipated to confer attributes to influenza, MERS, or SARS viruses such that the virus would have enhanced pathogenicity and/or transmissibility in mammals via the respiratory route.

The National Science Advisory Board for Biosecurity (NSABB) who oversee the GOF work released a document in May 2015 entitled "Framework for conducting risk and benefit assessments of gain-of-function research" which is included as Appendix 8. This together with the findings of risk benefit analysis by an independent contractor (Gryphon Scientific) will form the basis of their advice to the US government. The expected timetable for the process is shown below in a slide taken from a talk given by Carrie D. Wolinetz, Ph.D. the associate director for science policy at NIH. As can be seen from this slide the moratorium looks like remaining in place for at least another six months.



Alongside these US government plans there continues to be debate about the appropriateness of the moratorium with the publication of another paper from the Kawaoka laboratory (Ping et al (2015) "Development of high-yield influenza A virus vaccine viruses", Nature Communications 10.1038/ncomms 9148). Here he identifies 7 mutations in a vaccine strain (PR8) which allow higher yields of vaccine recombinants cultured in eggs. In a commentary by Jon Cohen entitled "Flu study raises questions about U.S. ban", Science 11 September 2015:1153 [DOI:10.1126/science.349.6253.1153] Kawaoka is quoted as saying the work couldn't have been done today because of the moratorium even though “it is very likely” that Kawaoka's group would have been granted an exemption.

Interestingly another recent paper (Rozo M, Gronvall GK. 2015. The re-emergent 1977 H1N1 strain and the gain-of function debate. mBio 6(4):e01013-15. doi:10.1128/mBio.01013-150) has added to the debate showing that the 1977 re-emergent H1N1 strain may well have arisen as a live vaccine trial escape. This is an alternative explanation to the case, often argued by proponents of the ban, that this event was an example of laboratory negligence.

9. Critical Infrastructure (For Information)

The committee will remember that the BSL3 facility in the Faculty of Medicine building was visited in October 2013, during a planned service, by the police unit that has been set up to monitor the security of infrastructure in Hong Kong. They consider this BSL3 to be "Critical Infrastructure" for Hong Kong and invited members of the unit to attend a seminar on the subject at police headquarters. Several University staff attended in November 2013 and Dr Poon has subsequently been to two other sessions.

At the time we noted that there was likely to be sporadic contact between the police and the BSL3 team. On Friday the 5th of June 2015 several police officers carried out what they termed a 'Walkthrough Physical Security Assessment (WPSA)'. They indicated that after completing the WPSA, a security survey report with proposed security device/options/suggestions would be provided for consideration. They also said that the report would not be sent by e-mail but in the form of a letter. As of Friday 25th September the report has not been received.

10. Dates of next meetings.

The next two Biosafety Committee meetings have been tentatively scheduled for 10th March 2016 and the 6th October 2016. These dates are intended to be flexible and will be confirmed nearer the time with committee members by e-mail.