



## **OFFLU Biorisk Management Guidelines for Handling Avian Influenza A(H7N9) Viruses in Veterinary Laboratories**

In 2013 a strain of low pathogenic avian influenza (H7N9) was isolated from humans in China with severe respiratory disease; infections were associated with human deaths, with a case fatality rate in excess of 20% based on reports to 13 May 2013. Hence this virus is a serious public health concern and can be considered a dangerous zoonosis. In recognition of the need for guidance on how to handle this avian influenza A(H7N9) virus safely the following biocontainment level guidelines for handling biological material that may contain the virus have been developed following consultation among OFFLU experts. They are based on biosafety guidelines published in the OIE Manual (1) and by the World Health Organization (2) and recommend that biorisks associated with this avian influenza A(H7N9) virus be considered no less than those associated with zoonotic HPAI H5N1 (see associated guidance on the OFFLU website)

Virus isolation and identification procedures, that result in propagation of the virus in either eggs or cell culture, and the subsequent handling and manipulation of such cultures in the laboratory, should be considered as posing a high level of risk of potentially fatal zoonotic infection to laboratory staff. Risk mitigation measures are recommended to include the following procedures:

- Laboratory work to be conducted in laboratories accessed only by staff appropriately trained to work with potentially lethal pathogens (such as is frequently classed as a level 3 facility)
- Personnel protective equipment should be worn, including solid-front laboratory coats, gloves, safety glasses and respirators with greater than or equal to 95% efficiency
- Specimens from potentially infected birds or animals should only be processed in type II or type III biological safety cabinets (BSC).
- Necropsies of birds submitted for diagnosis should be performed in a Type II BSC while wearing respiratory protection such as a N95 respirator or in a Type III biological safety cabinet.
- Centrifugation should be performed in sealed centrifuge cups.
- Centrifugation rotors should be opened, loaded and unloaded in a BSC.
- Work surfaces and equipment should be decontaminated after specimen processing.
- Contaminated materials should be decontaminated by autoclaving or disinfection before disposal or should be incinerated.

Animal (*in vivo*) experimentation and procedures with avian influenza A (H7N9) viruses should be done in appropriate facilities and using procedures designed to manage the risk of dangerous human pathogens and should include:

- Use of isolators or isolation rooms that are designed to fully contain infectious virus, that are at negative pressure to surrounding laboratory areas, that have HEPA filtration of exhaust air and containment and sterilization of all waste liquids and solids
- Staff should be adequately trained for work with lethal pathogens and be equipped with impervious outer clothing, protection against skin, eye or mucous membrane contact with infectious material and have breathing air protection.
- The facility should be equipped to allow staff to safely remove all protective gear in a non infected area immediately adjacent to but separate from the contaminated area and to shower before exiting the animal handling area.
- Specimens collected from *in vivo* infectious work should be carried to laboratory work areas in appropriate triple packages following applicable international transport regulations.

Specimens for diagnostic testing for avian influenza A(H7N9) that are considered at a lower risk of containing infectious virus may be processed without using respirators but with attention to other risk mitigation measures if using laboratory procedures that don't propagate live virus, such as

- polymerase chain reaction (PCR)
- antigen-capture assays
- serology (using inactivated reagents)

## References

1. World Organisation for Animal Health (OIE), 2012, Manual of standards for diagnostic tests and vaccines.  
<http://www.oie.int/en/international-standard-setting/terrestrial-manual/access-online/>
2. [Laboratory biorisk management for laboratories handling human specimens suspected or confirmed to contain avian influenza A\(H7N9\) virus causing human disease - interim recommendations, WHO, 10 May 2013, available on](http://www.who.int/influenza/human_animal_interface/influenza_h7n9/en/index.html)  
[http://www.who.int/influenza/human\\_animal\\_interface/influenza\\_h7n9/en/index.html](http://www.who.int/influenza/human_animal_interface/influenza_h7n9/en/index.html)
3. OFFLU: <http://www.offlu.net/index.php?id=111>, accessed 13 May 2013