Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET

Avian Influenza Viruses (LPAI/HPAI)

CHARACTERISTICS	
Background and Morphology	Avian influenza viruses are designated as low pathogenic avian influenza (LPAI) and highly pathogenic avian influenza (HPAI) based on severity of infection in poultry. The designation refers to viral characteristics and its ability to cause disease and mortality in poultry. HPAI and LPAI designations do not refer to the severity of illness in human infections. Outbreaks of HPAI have led to human infections, some of which resulted in deaths. LPAI and HPAI viruses have caused mild to severe illness in infected humans. Family Orthomyxoviridae. Negative sense single-stranded RNA virus. Virus capsid is enveloped. Virions are spherical to pleomorphic.
Growth Conditions	Influenza viruses are propagated in embryonated eggs or in cell culture (e.g., MDCK).

HEALTH HAZARDS	
Host Range	Primarily domestic and wild avian (bird) species. Humans, terrestrial, and aquatic mammals have also been infected. As of July 2024, there is no evidence of sustained human-to-human H5N1 virus transmission.
Special Precautions	All individuals entering areas where work with H5 or H7 subtypes of avian influenza virus is conducted, are restricted from having contact with susceptible avian species (includes but is not limited to pet birds, backyard poultry flocks, birds at county/state fairs, commercial poultry operations, zoological collections, and wild birds) for a minimum of 5 days after the last possible contact with these viruses.
Modes of Exposure	Mucous membrane exposure to secretions/excreta from infected birds and can also occur by inhalation of aerosols, droplets, or contact/fomite transmission.
Signs and Symptoms	Range from asymptomatic or mild illness, such as conjunctivitis or mild upper respiratory tract illness (e.g., cough, sore throat, fever, rhinorrhea, fatigue, myalgia, arthralgia, headache, etc.) to severe respiratory illness (e.g., shortness of breath or difficulty breathing, pneumonia, etc.).
Infectious Dose	The experimental median infectious doses for H5N1 are 10^1, $10^{3.4}$, and $<10^1$ in turkeys, chickens, and ducks, respectively.
Incubation Period	Average 2-5 days, ranging up to 17 days.

MEDICAL PRECAUTIONS / TREATMENT	
Vaccines	No commercial avian influenza vaccine is currently available for humans. Personnel are however advised to be vaccinated against annual circulating (seasonal) influenza viral strains.
Diagnosis & Treatment	Clinicians should contact the state public health department to arrange testing for avian influenza virus. Oseltamivir may be used as treatment or chemoprophylaxis in cases meeting epidemiologic exposure criteria.
Surveillance	Self-report any acquired influenza-like symptoms, daily temperature recording, and self-isolate for further medical evaluation.
Emory Requirements	Report any accidents/exposures.

LABORATORY HAZARDS	
Laboratory Acquired Infections (LAIs)	Laboratory acquired infections may result from exposure to mucous membranes including the upper respiratory tract through fomite transmission.

SUPPLEMENTAL REFERENCES	
CDC	Highly Pathogenic Avian Influenza A(H5N1) Virus in Animals: Interim Recommendations for Prevention, Monitoring, and Public Health Investigations
CDC BMBL	Biosafety in Microbiological and Biomedical Laboratories, 6th Edition
Government of Canada	Influenza A virus subtypes H5, H7, and H9: Infectious substances pathogen safety data sheet
USDA	HPAI (H5N1) Information

CONTAINMENT	
BSL2+/ABSL2+	All experiments with avian influenza viruses are conducted at a minimum containment level of BSL2+/ABSL2+ based on risk assessment.
BSL3/ABSL3	H5N1 HPAI requires BSL3/ABSL3 containment.

SPILL PROCEDURES	
Small	Contain the spill by covering with paper towels or damming to prevent spread. Don appropriate PPE. Apply an appropriate disinfectant working from the perimeter towards the center. Allow 30 minutes of contact time before disposal and cleanup of spill materials.
Large	Contain the spill, notify and evacuate others in the area, then contact Emory's Biosafety Officer (404-357-1821) or the EHSO Spill Response Team (404-727-2888).

EXPOSURE PROCEDURES		
Mucous membrane	Flush eyes, mouth, or nose for 15 minutes at an eyewash station.	
Other Exposures	Wash area with soap and water for 15 minutes.	
Seek Medical Attention	7:30 am - 4:00 pm (OHS): 404-686-8587	After Hours: NP On Call 404-686-5500, PIC# 50464
	Needle Stick: EUH (404-686-8587) EUHM (404-686-2352)	ENPRC: Maureen Thompson Office (404-727-8012) Cell (404-275-0963)
Reporting	Immediately report incidents to supervisor. Accidents/Exposures are reported in H.O.M.E. via PeopleSoft. Emory HR website > Self-Service > Workplace Health > Report	

VIABILITY	
Disinfection	Accelerated hydrogen peroxide products (e.g., Peroxigard™), 10% bleach, 70% ethanol, and phenolic disinfectants (e.g., Vesphene®).
Inactivation	Virions are sensitive to treatment with heat, lipid solvents, non-ionic detergents, formaldehyde, oxidizing agents. The infectivity is reduced after exposure to irradiation.
Survival Outside Host	HPAI H5N1 has been shown to survive up to 18 hours at 42°C, 24 hours at 37°C, 5 days at 24°C, and 8 weeks at 4°C in dry and wet poultry feces. The survival time for H5N1 is ~26 hours on plastic surfaces and ~4.5 hours on human skin surfaces.

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
Minimum PPE Requirements	Gloves, lab coat/gown, eye protection, face protection, closed toe shoes, long pants/skirt. Minimum PPE for personnel working with H5N1: • All personnel will change from street clothes into facility-dedicated scrubs and clogs. • Tyvek® suit with head covering and integrated booties will be worn over the scrubs and clogs. • Tie-back cover gowns with long sleeves will be worn over Tyvek® suits. • Double gloves with inner layer taped to Tyvek® suit and additional shoe covers over Tyvek® booties are required for all personnel entering the A/BSL3 facility. • Powered air purifying respirators (PAPR) or controlled air purifying respirators (CAPR®) with a full head shroud (hood) or full face covering.
Additional Precautions	Personnel working with H5N1 or personnel entering areas with active H5N1 research are required to shower out before donning street clothes.

PERMIT REQUIREMENTS	
USDA/APHIS	LPAI and HPAI viruses require a VS 16-6 permit from the APHIS, Veterinary Services (VS), Organisms and Vectors (OV) Permitting Unit. Only the H5N1 HPAI virus is allowed to be handled at Emory University due to the temporary exemption from the Federal Select Agent Program Regulations.