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| **Influenza Virus Supplemental** [FAQ](https://www.ehs.washington.edu/biological/biological-research-approval/biological-use-authorization-bua-application-faqs#DNA2)List recombinant or genetically modified influenza viruses that you will use or that you will create. Attach to your BUA application or Request for Change to BUA. |

**General Information**

* Strain Designations
	+ Influenza A viruses are classified by subtypes based on the properties of their hemagglutinin (H or HA) and neuraminidase (N or NA) surface proteins. There are 18 different HA subtypes and 11 different NA subtypes. Subtypes are named by combining the H and N numbers – e.g., H1N1, H3N2.
	+ Nomenclature:



* General containment guidance (specifics depend on risk assessment)
* H1N1 and H3N2 require BSL-2.
* Domestic Low Pathogenicity Avian Influenza (LPAI) strains require BSL-2 with 3 practices.
* Non-U.S Low Pathogenicity Avian Influenza (LPAI), H2 Influenza A, and Highly Pathogenic Avian Influenza (HPAI) strains require BSL-3.
* The PR8 backbone can be used to lower the biosafety level in certain cases.
1. Below is a list of currently approved influenza strains. Indicate by checking the box in column A which influenza strains are used or will be modified in your laboratory. Any modifications to these strains needs to be listed in Table 2 with a description of genetic modifications.

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| **Influenza A Strains** |
| 1. **Will you use or modify?**
 | 1. **Strain Designation**
 | 1. **Required Biosafety Level (BSL)**
 | 1. **Starting NIH Section**
 |
| [ ]  Yes | A/Beijing/262/1995 (H1N1) | 2 | NA |
| [ ]  Yes | A/Brisbane/10/2007 (H3N2) | 2 | NA |
| [ ]  Yes | A/California/04/2009 (H1N1) | 2 | NA |
| [ ]  Yes | A/Fort Monmouth/1/1947 (H1N1) | 2 | NA |
| [ ]  Yes | A/Georgia/M5081/2012 (H1N1) | 2 | NA |
| [ ]  Yes | A/Hong Kong/8/68 (H3N2) | 2 | NA |
| [ ]  Yes | A/Johannesburg/33/1994 (H3N2) | 2 | NA |
| [ ]  Yes | A/Johannesburg/33/1994 (H3N2)-PR8 | 2 | NA |
| [ ]  Yes | A/Mexico/4108/2009 (H1N1) | 2 | NA |
| [ ]  Yes | A/Netherlands/602/2009 (H1N1) | 2 | NA |
| [ ]  Yes | A/New Caledonia/20/1999 (H1N1) | 2 | NA |
| [ ]  Yes | A/Panama/2007/1999 (H3N2) | 2 | NA |
| [ ]  Yes | A/Philippines/2/1982 (H3N2) | 2 | NA |
| [ ]  Yes | A/Puerto Rico/8/1934 (H1N1) | 2 | NA |
| [ ]  Yes | A/Solomon Islands/3/2006 (H1N1) | 2 | NA |
| [ ]  Yes | A/Sydney/5/1997 (H3N2) | 2 | NA |
| [ ]  Yes | A/Texas/50/2012 (H3N2) | 2 | NA |
| [ ]  Yes | A/Uruguay/716/2007 (H3N2) | 2 | NA |
| [ ]  Yes | A/Victoria/361/2011 (H3N2) | 2 | NA |
| [ ]  Yes | A/Wisconsin/15/2009 (H3N2) | 2 | NA |
| [ ]  Yes | A/Wisconsin/67/2005 (H3N2) | 2 | NA |
| [ ]  Yes | A/WSN/33 (H1N1) | 2 | NA |
| [ ]  Yes | A/X31 (H3N2) | 2 | NA |
| [ ]  Yes | A/Yokohama/135/2018 (H3N2) | 2 | NA |
| [ ]  Yes | A/Anhui/1/2005 (H5N1)-PR8 HALo | 2 w/3 practices | III-D |
| [ ]  Yes | A/Egypt/N03072/10 (H5N1)-PR8 HALo | 2 w/3 practices | III-D |
| [ ]  Yes | A/Hong Kong (H9N2)-PR8 | 2 w/3 practices | NA |
| [ ]  Yes | A/Hubei/2010 (H5N1)-PR8 | 2 w/3 practices | III-D |
| [ ]  Yes | A/Indonesia/5/05 (H5N1)-PR8 HALo | 2 w/3 practices | III-D |
| [ ]  Yes | A/mallard/Illinois/10OS4334/2010 (H10N7) | 2 w/3 practices | NA |
| [ ]  Yes | A/Netherlands (H7N7)-PR8 | 2 w/3 practices | NA |
| [ ]  Yes | A/red knot/Delaware/541/1988 (H4N6) | 2 w/3 practices | NA |
| [ ]  Yes | A/Shanghai (H7N9)-PR8 | 2 w/3 practices | NA |
| [ ]  Yes | A/turkey/Massachusetts/3740/1965 (H6N2) | 2 w/3 practices | NA |
| [ ]  Yes | A/turkey/Wisconsin/1/1966 (H9N2) | 2 w/3 practices | NA |
| [ ]  Yes | A/Vietnam/1203 (H5N1)-PR8 | 2 w/3 practices | III-D |
| [ ]  Yes | A/Virginia (H7N2)-PR8 | 2 w/3 practices | NA |
| [ ]  Yes | A/Barn swallow/Hong Kong/D10-1161/2010 (H5N1) | 3 | NA |
| [ ]  Yes | A/chicken/Germany/N/1949 (H10N7) | 3 | NA |
| [ ]  Yes | A/duck/Germany/1215/1973 (H2N3) | 3 | NA |
| [ ]  Yes | A/Egypt/N03072/2010 (H5N1) | 3 | NA |
| [ ]  Yes | A/Hong Kong/483/1997 (H5N1) | 3 | NA |
| [ ]  Yes | A/Hong Kong/6841/2010 (H5N1) | 3 | NA |
| [ ]  Yes | A/Hong Kong (H9N2) | 3 | NA |
| [ ]  Yes | A/Hubei/2010 (H5N1) | 3 | NA |
| [ ]  Yes | A/Indonesia/05/2005 (H5N1) | 3 | NA |
| [ ]  Yes | A/mallard/ New York/6750/1978 (H2N2) | 3 | NA |
| [ ]  Yes | A/mallard/Wisconsin/2785/2009 (H2N3) | 3 | NA |
| [ ]  Yes | A/Netherlands (H7N7) | 3 | NA |
| [ ]  Yes | A/Shanghai (H7N9) | 3 | NA |
| [ ]  Yes | A/shearwater/Australia/1/1973 (H6N5) | 3 | NA |
| [ ]  Yes | A/turkey/Ontario/6118/1968 (H8N4) | 3 | NA |
| [ ]  Yes | A/Vietnam/1203/2004 (H5N1) | 3 | NA |
| **Influenza B Strains** |
| [ ]  Yes | B/Brisbane/60/2008 | 2 | NA |
| [ ]  Yes | B/Florida/4/2006 | 2 | NA |
| [ ]  Yes | B/Malaysia/2506/2004 | 2 | NA |
| [ ]  Yes | B/Massachusetts/02/2012 | 2 | NA |

1. If the strains you use are not listed above or if you will make further genetic modifications to the strains checked above, list and describe in this table.

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| 1. **Strain Designation**
 | 1. **Describe the strain and any genetic modifications that you propose to make or that have already been made.**
 | 1. **Indicate** [**Risk Group**](https://my.absa.org/tiki-index.php?page=Riskgroups) **1, 2, or 3**
 | 1. **Recombinant**
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| ***EXAMPLE****A/chicken/Indonesia/NC/2009 (H5N1) – PR8* | *UW-PR8 backbone (a high-growth variant of PR8) with H5 and N1 from HPAI A/chicken/Indonesia/NC/2009.* | *Risk Group 3* | [x]  *Yes* [ ]  *No* |
|       |       | Risk Group       | [ ]  Yes [ ]  No |
|       |       | Risk Group       | [ ]  Yes [ ]  No |
|       |       | Risk Group       | [ ]  Yes [ ]  No |
|       |       | Risk Group       | [ ]  Yes [ ]  No |
|       |       | Risk Group       | [ ]  Yes [ ]  No |
|       |       | Risk Group       | [ ]  Yes [ ]  No |
|       |       | Risk Group       | [ ]  Yes [ ]  No |
|       |       | Risk Group       | [ ]  Yes [ ]  No |
|       |       | Risk Group       | [ ]  Yes [ ]  No |

**Safety and Occupational Health Considerations**

Based on a risk assessment, restrictions may be imposed for research with certain influenza virus strains including:

* Restrictions on co-culturing or simultaneous work with multiple approved viruses.
* Restricting personnel who have recently been ill or recently been vaccinated with a live-attenuated Influenza A virus (IAV) vaccine.
* Restrictions on contact with avian species or their housing.

Additional recommendations for vaccination and a medical surveillance and response plan may be warranted for certain strains. Strains requiring BSL-3 containment also require specific enhancements outlined in the BMBL and NIH Guidelines (Appendix G-II-C-5).

**Questions?**

Contact EH&S Biosafety at ehsbio@uw.edu or 206-221-7770.

**References**

* [Biosafety in Microbiological and Biomedical Laboratories (BMBL)](https://www.cdc.gov/biosafety/publications/bmbl5/), Section VIII-E
* [NIH Guidelines](https://osp.od.nih.gov/wp-content/uploads/NIH_Guidelines.htm) III-D-7, Appendix B, and Appendix G-II-C-5
* [Federal Select Agent Program’s Guidelines for Avian Influenza Viruses](https://www.selectagents.gov/compliance/guidance/avian/index.htm)
* [CDC Types of Influenza Viruses](https://www.cdc.gov/flu/about/viruses/types.htm)
* [CDC Influenza Type A Viruses](https://www.cdc.gov/flu/avianflu/influenza-a-virus-subtypes.htm)