

**Kilbourne F32: A/NWS/1934 (HA) x A/Beijing/353/1989 (NA) x A/Rockefeller Institute/5/1957 x A/Puerto Rico/8/1934 (H1N2)**

**Catalog No. NR-3541**

Derived from NIAID Catalog No. V-331-0E5202

**For research use only. Not for human use.**

**Contributor:**

National Institutes of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH)

**Manufacturer:**

BEI Resources

**Product Description:**

Virus Classification: *Orthomyxoviridae, Influenzavirus A*

Species: Influenza A virus

Reassortant: A/NWS/1934 (HA) x A/Beijing/353/1989 (NA) x A/Rockefeller Institute/5/1957 x A/Puerto Rico/8/1934 (H1N2) (Kilbourne F32)<sup>1-3</sup>

Parents: X-12 (H1N2) and X-109 (H3N2)

Comments: NR-3541 was developed by crossing two previously derived influenza A virus reassortants. X-12 (Kilbourne F82; BEI Resources NR-3545) is A/NWS/1934 (HA) x A/Rockefeller Institute/5/1957 (NA) (H1N2).<sup>4,5</sup> X-109 is A/Beijing/353/1989 (HA, NA) x A/Puerto Rico/8/1934 (H3N2).<sup>6,7</sup> Nucleotide sequencing at BEI Resources of a portion of the matrix (M) gene (RNA 7) from NR-3541 indicates that the M gene is derived from A/Puerto Rico/8/1934 (H1N1). The derivation of the five genes encoding the remaining internal proteins and the nonstructural protein has not been determined genotypically.

Like the X-12 parent, NR-3541 is trypsin sensitive – the virus undergoes rapid and selective destruction of hemagglutinin on the virion surface upon treatment with trypsin.<sup>1,4,5</sup>

The HA donor of NR-3541 is designated “A/NWS/34” in the Kilbourne Archive.<sup>1,3,5</sup> According to Kilbourne, the nomenclature for neurotropic (NWS and WSN) mutants of the original A/Wilson-Smith/1933 (H1N1) human influenza isolate does not usually require the insertion of a date, but if a date is given it should be 1933.<sup>8</sup> Unfortunately, the usage of A/NWS/1933 and A/NWS/1934 is inconsistent, both in the Kilbourne collection and in the literature.

**Material Provided:**

Each vial contains approximately 1 mL of pooled allantoic fluid from specific pathogen free (SPF) embryonated chicken eggs infected with reassortant influenza A virus,

A/NWS/1934 (HA) x A/Beijing/353/1989 (NA) x A/Rockefeller Institute/5/1957 x A/Puerto Rico/8/1934 (H1N2).

**Packaging/Storage:**

NR-3541 was packaged aseptically in screw-capped plastic cryovials. The product is provided frozen and should be stored at -60°C or colder immediately upon arrival. For long-term storage, the vapor phase of a liquid nitrogen freezer is recommended. Freeze-thaw cycles should be avoided.

**Growth Conditions:**

Host: 9- to 11-day-old SPF embryonated chicken eggs

Infection: Embryonated chicken eggs must be candled for viability prior to inoculation

Incubation: 2 days at 35°C in a humidified chamber

Effect: Hemagglutination activity using chicken red blood cells and allantoic fluid from infected embryonated chicken eggs

**Citation:**

Acknowledgment for publications should read “The following reagent was obtained through BEI Resources, NIAID, NIH: Kilbourne F32: A/NWS/1934 (HA) x A/Beijing/353/1989 (NA) x A/Rockefeller Institute/5/1957 x A/Puerto Rico/8/1934 (H1N2), NR-3541.”

**Biosafety Level: 2**

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. Biosafety in Microbiological and Biomedical Laboratories. 5th ed. Washington, DC: U.S. Government Printing Office, 2009; see [www.cdc.gov/biosafety/publications/bmb15/index.htm](http://www.cdc.gov/biosafety/publications/bmb15/index.htm).

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**References:**

1. <https://www.beiresources.org/Portals/2/Flu-archiveDocs/F32.doc>
2. <https://www.beiresources.org/Flu-archive.aspx>
3. <https://www.beiresources.org/FluVirusCatalog.aspx>
4. Erickson, A. H., and E. D. Kilbourne. "Mutation in the Hemagglutinin of A/N—WS/33 Influenza Virus Recombinants Influencing Sensitivity to Trypsin and Antigenic Reactivity." *Virology* 107 (1980): 320-330. PubMed: 6161475.
5. <https://www.beiresources.org/Portals/2/Flu-archiveDocs/F82.doc>
6. <https://www.beiresources.org/Portals/2/Flu-archiveDocs/F73.doc>
7. Xu, X., et al. "Nonimmunoselected Intrastrain Genetic Variation Detected in Pairs of High-Yielding Influenza A (H3N2) Vaccine and Parental Viruses." *J. Infect. Dis.* 170 (1994): 1432-1438. PubMed: 7995982.
8. <http://www.beiresources.org/flu-archive/Downloads.aspx> (Archive and Catalog of Influenza Virus Reassortants and Mutants).

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