**INFLUENZA REAGENT**

**Influenza Virus Infectious**
A/North Carolina/01/2021 (H1N1) NYMC X-375
NIBSC code: 22/136

Instructions for use
(Version 2.0, Dated 16/08/2022)

1. **INTENDED USE**
Reagent 22/136 is prepared from NYMC X-375 (A/North Carolina/01/2021 (H1N1) x NYMC X-157) which was processed in 250µl volumes as liquid stock. The known passage history of X-375 is attached.

2. **CAUTION**
The material is not of human or bovine origin. This preparation is not for administration to humans or animals.

As with all materials of biological origin, this preparation should be regarded as potentially hazardous to health. It should be used and discarded according to your own laboratory’s safety procedures. Such safety procedures should include the wearing of protective gloves and avoiding the generation of aerosols. Care should be exercised in opening ampoules or vials, to avoid cuts.

3. **UNITAGE**
No unitage is assigned to this material.

4. **CONTENTS**
Country of origin of biological material: United Kingdom.
Each vial contains 250µl (nominal) of infectious influenza virus as allantoic fluid from SPF embryonated hen’s eggs.

5. **STORAGE**
Store in the dark at -70ºC or below.
Material type: Liquid – will be shipped according to the storage and shipping conditions of the product.

6. **DIRECTIONS FOR OPENING**
Vials have a screw cap; an internal stopper may also be present. The cap should be removed by turning anti-clockwise. Care should be taken to prevent loss of the contents. Please note: If a stopper is present on removal of the cap, the stopper should remain in the vial or be removed with the cap.

7. **USE OF MATERIAL**
Ready to use.

8. **STABILITY**
Reference materials are held at NIBSC within assured, temperature-controlled storage facilities. Reference Materials should be stored on receipt as indicated on the label.

NIBSC follows the policy of WHO with respect to its reference materials.

9. **REFERENCES**
NA

10. **ACKNOWLEDGEMENTS**
NA

11. **FURTHER INFORMATION**
Further information can be obtained as follows;
This material: enquiries@nibsc.org
WHO Biological Standards:
http://www.who.int/biologicals/en/
JCTLM Higher order reference materials:
http://www.bipm.org/en/committees/jc/jctlm/
Derivation of International Units:
http://www.nibsc.org/standardisation/international_standards.aspx
Ordering standards from NIBSC:
http://www.nibsc.org/products/ordering.aspx
NIBSC Terms & Conditions:
http://www.nibsc.org/terms_and_conditions.aspx

12. **CUSTOMER FEEDBACK**
Customers are encouraged to provide feedback on the suitability or use of the material provided or other aspects of our service. Please send any comments to enquiries@nibsc.org

13. **CITATION**
In all publications, including data sheets, in which this material is referenced, it is important that the preparation’s title, its status, the NIBSC code number, and the name and address of NIBSC are cited and cited correctly.

14. **MATERIAL SAFETY SHEET**

<table>
<thead>
<tr>
<th>Physical and Chemical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical appearance: Clear liquid</td>
</tr>
<tr>
<td>Corrosive: No</td>
</tr>
<tr>
<td>Stable: Yes</td>
</tr>
<tr>
<td>Hygroscopic: No</td>
</tr>
<tr>
<td>Flammable: No</td>
</tr>
<tr>
<td>Other (specify): Live influenza virus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicological properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects of inhalation: Likelihood of influenza virus infection.</td>
</tr>
<tr>
<td>Effects of ingestion: Not established, avoid ingestion</td>
</tr>
<tr>
<td>Effects of skin absorption: Not established, avoid contact with skin</td>
</tr>
</tbody>
</table>

**Suggested First Aid**

- Inhalation: Seek medical advice
- Ingestion: Seek medical advice
- Contact with eyes: Wash with copious amounts of water. Seek medical advice
- Contact with skin: Wash thoroughly with water.

**Action on Spillage and Method of Disposal**

Spillage of ampoule contents should be taken up with absorbent material wetted with an appropriate disinfectant. Rinse area with an appropriate disinfectant followed by water. Absorbent materials used to treat spillage should be treated as biological waste.
15. LIABILITY AND LOSS
In the event that this document is translated into another language, the English language version shall prevail in the event of any inconsistencies between the documents. Unless expressly stated otherwise by NIBSC, NIBSC’s Standard Terms and Conditions for the Supply of Materials (available at http://www.nibsc.org/About_Us/Terms_and_Conditions.aspx or upon request by the Recipient) (“Conditions”) apply to the exclusion of all other terms and are hereby incorporated into this document by reference. The Recipient’s attention is drawn in particular to the provisions of clause 11 of the Conditions.

16. INFORMATION FOR CUSTOMS USE ONLY

<table>
<thead>
<tr>
<th>Country of origin for customs purposes*: United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Defined as the country where the goods have been produced and/or sufficiently processed to be classed as originating from the country of supply, for example a change of state such as freeze-drying.</td>
</tr>
</tbody>
</table>

| Net weight: 0.25g per vial. |
| Toxicty Statement: Non-toxic |
| Veterinary certificate or other statement if applicable. |
| Attached: No |

**Passage history of NYMC X-375 (H1N1)**

<table>
<thead>
<tr>
<th>Cumulative number of passages</th>
<th>Passage numbers at each stage</th>
<th>Lot</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>E2</td>
<td>E2</td>
<td>3030724515</td>
<td>CDC, USA</td>
</tr>
<tr>
<td>E11</td>
<td>E2/E1/E8</td>
<td>E#6515</td>
<td>NYMC, USA</td>
</tr>
<tr>
<td>E12</td>
<td>E2/E1/E8/E1</td>
<td>46990</td>
<td>NIBSC, UK</td>
</tr>
</tbody>
</table>

Sterility: No visible contamination was detected in a variety of media (tryptose soya broth, thioglycolate broth, Sabouraud’s broth and blood agar plates) after 14 days incubation.

The HA and NA sequence of this virus is available at GISAID with the accession number EPI_ISL_13633117.
Derivation of NYMC X-375  
A/North Carolina/1/2021 (H1N1pdm) with NYMC X-157 CL-3  
High Yield A H1N1pdm Reassortant (6:2)  
with A/PR/8/34 M, PB1, PB2, PA, NS and NP genes and  
A/North Carolina/1/2021 HA and NA genes

Exper. # 4878 II  
A/North Carolina/1/2021, H1N1pdm  
CDC # 3030724515  
E2 (8/6/21)  
HA: 128  
STK pool

**Passages at New York Medical College**

<table>
<thead>
<tr>
<th>Passage No.</th>
<th>titer:</th>
</tr>
</thead>
</table>
| 1           | 10^{-1} | HA—1:512  
| 2           | 10^{-4} + 10^{-2} | HA—1:256  
| 3           | 10^{-1} | HA—1:512  
| 4           | 10^{-1} | HA—1:128  
| 5           | 10^{-3} | HA—1024  
| 6           | 10^{-4} | HA—1:1024  

A/North Carolina/1/2021 (H1N1pdm) x NYMC X-157 CL-3  
+ X-157 HANA antisera (as)  
X-157 HANA antibodies (ab)  
+ X-157 HANA antisera (as)  
X-157 HANA antibodies (ab)  
+ X-157 HANA antisera (as)  
X-157 HANA antibodies (ab)  
+ X-157 HANA antisera (as)  
X-157 HANA antibodies (ab)
HA Yield by UPLC Analysis (µg HA/ml allantoic fluid)

<table>
<thead>
<tr>
<th>wt (wild type)</th>
<th>X-375</th>
<th>Fold Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>11.4</td>
<td>2.3</td>
</tr>
</tbody>
</table>

HA and NA, genes were identified as A/North Carolina/1/2021 by RT-PCR/RFLP gene analysis. The M, PB1, PB2, PA, NS and NP genes were identified as A/PR/8/34 by RT-PCR/RFLP analysis.

SPF eggs were used for all reassortant passages.

Virus seed was shown to be sterile. Sterility testing was performed by streaking the sample on blood agar plates and incubating for 48 hours at 37 °C.

All titers performed with chicken red blood cells.