Influenza Reagent
Influenza Virus Infectious NYMC X-223A
NIBSC code: 13/252
Instructions for use
(Version 4.0, Dated 19/05/2016)

1. INTENDED USE
Reagent 13/252 is prepared from NYMC X-223A which was processed for freeze drying in 250μl volumes as described by Campbell, PJ, Journal of Biological Standardisation, 1974, 2,249-267. The known passage history of NYMC X-223A is attached.

2. CAUTION
This preparation is not for administration to humans or animals in the human food chain.

The material is not of human or bovine origin. 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 ampoule contains 250μl (nominal) of infectious influenza virus as allantoic fluid from SPF embryonated hen's eggs.

5. STORAGE
Store in the dark at -20°C or below
Please note: because of the inherent stability of lyophilized material, NIBSC may ship these materials at ambient temperature.

6. DIRECTIONS FOR OPENING
DIN ampoules have an 'easy-open' coloured stress point, where the narrow ampoule stem joins the wider ampoule body. Various types of ampoule breaker are available commercially. To open the ampoule, tap the ampoule gently to collect material at the bottom (labelled) end and follow manufactures instructions provided with the ampoule breaker.

7. USE OF MATERIAL
Reconstitute the contents of one ampoule of reagent with 250μl of sterile distilled water. Leave for a minimum of 5 minutes before use to allow for complete solution of freeze-dried material. A range of dilutions (e.g. 10⁻⁴ to 10⁻³) should be made in a suitable medium for initial cultivation.

8. STABILITY
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.biopm.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
Classification in accordance with Directive 2000/54/EC, Regulation (EC) No 1272/2008: Not applicable or not classified

<table>
<thead>
<tr>
<th>Physical and Chemical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical appearance:</td>
</tr>
<tr>
<td>Stable:</td>
</tr>
<tr>
<td>Hygroscopic:</td>
</tr>
<tr>
<td>Flammable:</td>
</tr>
<tr>
<td>Other (specify):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicological properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects of ingestion:</td>
</tr>
<tr>
<td>Effects of skin absorption:</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 contents should be taken up with absorbent material wetted with an appropriate virucidal agent. Rinse area with an appropriate virucidal agent followed by water. Absorbent materials used to treat spillage should be treated as biologically hazardous 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
16. INFORMATION FOR CUSTOMS USE ONLY

Country of origin for customs purposes*: United Kingdom
* 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.

Net weight: NA
Toxicity Statement: Non-toxic
Veterinary certificate or other statement if applicable.
Attached: No

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Passage history of NYMC X-223A (Post mixed infection)

<table>
<thead>
<tr>
<th>Passage</th>
<th>Lot</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>E5 (prior to receipt at NYMC)</td>
<td>unknown</td>
<td></td>
</tr>
<tr>
<td>E5/E1 – E5/E7</td>
<td></td>
<td>NYMC, New York, USA</td>
</tr>
<tr>
<td>E5/E8</td>
<td>E#6034</td>
<td>NYMC, New York, USA</td>
</tr>
<tr>
<td>E9</td>
<td>35400</td>
<td>NIBSC, Hertfordshire, 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 on GISAID with the accession number EPI_ISL_215972
Derivation of NYMC X-223A High Yield H3N2 Reassortant (6:2)  
With A/PR/8/34 PA, PB2, PB1, NP, NS and M genes  
and A/Texas/50/2012 HA and NA genes

Experiment #4711 (1/2/12)  
A/Texas/50/2012 (H3N2) CDC#: 2012704893 E5 (10/18/12) HA: 256

Passage No.  
1 to 5  
Passages prior to receipt at NYMC (E5)

Reassortment passage at NYMC  
A/Texas/50/2012 × A/PR/8/34

<table>
<thead>
<tr>
<th>Passage</th>
<th>10^(-1)</th>
<th>10^(-4)</th>
<th>HA</th>
<th>Reassortant passage</th>
<th>Antigen and Antibody</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>1:4096</td>
<td>A/PR/8/34 anti sera (as)</td>
<td>A/PR/8/34 HANA antibodies (ab)</td>
</tr>
<tr>
<td>7</td>
<td>10^(-1)</td>
<td></td>
<td>1:1024</td>
<td>A/PR/8/34 anti sera (as)</td>
<td>A/PR/8/34 HANA antibodies (ab)</td>
</tr>
<tr>
<td>8</td>
<td>10^(-3)</td>
<td></td>
<td>1:512</td>
<td>A/PR/8/34 anti sera (as)</td>
<td>A/PR/8/34 HANA antibodies (ab)</td>
</tr>
<tr>
<td>9</td>
<td>10^(-3)</td>
<td></td>
<td>1:1024</td>
<td>A/PR/8/34 anti sera (as)</td>
<td>A/PR/8/34 HANA antibodies (ab)</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>10^(-4)</td>
<td>1:1024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>10^(-8)</td>
<td></td>
<td>1:1024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>10^(-8)</td>
<td></td>
<td>1:512</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>10^(-5)</td>
<td></td>
<td>1:1024</td>
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NYMC X-223 E5E8  
E# 6034 NYMC archive

HA and NA were identified as A/Texas/50/2012 serologically by HI and NI tests and confirmed by RT-PCR/RFLP analysis. Internal genes PA, PB2, PB1, NP, NS and M were identified as A/PR/8/34 and HA, NA as A/Texas/50/2012 by RT-PCR/RFLP. SPF-AS eggs were used for all reassortant passages. All HA titers were tested using guinea pig red blood cells at room temp. Virus seeds were shown to be sterile by streaking samples on sheep blood agar plates and incubating for 48 hours at 37 degrees C.
Dear Dr. Bucher,

We appreciate your submitting influenza reassortants to CDC for analysis. Data from your laboratory and other collaborating laboratories worldwide contribute significantly towards the influenza vaccine recommendations made each year by WHO.

The results we obtained with your reassortants are listed and interpreted below.

Your reassortant was characterized by a “one-way” hemagglutination-inhibition test using post-infection ferret antisera and guinea pig red blood cells (GP).

<table>
<thead>
<tr>
<th>CDC ID#</th>
<th>Specimen ID#</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013706003</td>
<td>A/HAWAII/22/2012 X-225</td>
<td>CONSISTENT WITH A/HAWAII/22/2012-LIKE (H3N2) PASS</td>
</tr>
<tr>
<td>2013706004</td>
<td>A/HAWAII/22/2012 X-225A</td>
<td>CONSISTENT WITH A/HAWAII/22/2012-LIKE (H3N2) PASS</td>
</tr>
<tr>
<td>2013706001</td>
<td>A/Texas/50/2012 X-223</td>
<td>CONSISTENT WITH A/Texas/50/2012-LIKE (H3N2) PASS</td>
</tr>
<tr>
<td>2013706002</td>
<td>A/Texas/50/2012 X-223A</td>
<td>CONSISTENT WITH A/Texas/50/2012-LIKE (H3N2) PASS</td>
</tr>
</tbody>
</table>

Your reassortants have HI reactivity patterns that are consistent with their corresponding wild type viruses.

If you have any questions, please contact us.

Sincerely,

Dr. Xiyuan Xu
Team Leader, Virus Reference Team, Viral Surveillance and Diagnosis Branch, Influenza Division, CDC

Dr. Alexander Klimov
Deputy Director, WHO Collaborating Center for Surveillance, Epidemiology and Control of Influenza, Influenza Division, CDC
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<tr>
<td>2013706003</td>
<td>A/HAWAII/22/2012 X-225</td>
<td>CONSISTENT WITH A/HAWAII/22/2012-LIKE (H3N2) GP PASS</td>
</tr>
<tr>
<td>2013706002</td>
<td>A/TEXAS/50/2012 X-223A</td>
<td>CONSISTENT WITH A/TEXAS/50/2012-LIKE (H3N2) GP PASS</td>
</tr>
</tbody>
</table>

Your reassortants have HI reactivity patterns that are consistent with their corresponding wild type viruses.

If you have any questions, please contact us.

Sincerely,

Dr. Xiyan Xu
Team Leader
Virus Reference Team
Virus Surveillance and Diagnosis Branch
Influenza Division, CDC

Dr. Alexander Klimov
Deputy Director
WHO Collaborating Center for Surveillance, Epidemiology and Control of Influenza
Influenza Division, CDC
Doris Bucher, Ph.D.  
Department of Microbiology and Immunology  
New York Medical College  
Basic Science Building  
Valhalla, NY 10595

01/09/2013

Dear Dr. Bucher,

We appreciate your submitting influenza reassortants to CDC for analysis.

The HA and NA genes of your reassortants were sequenced and compared to that of their wild type parental virus A/Texas/50/2012. The results we obtained with your reassortants are listed and interpreted below.

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<tr>
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<th>Specimen ID#</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013706001</td>
<td>A/Texas/50/2012 X223</td>
<td>HA: Ile-226-Asn and Lys-387-Glu</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NA: No change detected</td>
</tr>
<tr>
<td>2013706002</td>
<td>A/Texas/50/2012 X-223A</td>
<td>HA: Ile-226-Asn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NA: No change detected</td>
</tr>
</tbody>
</table>

A number of amino acid changes were detected in the HA genes of the reassortants. Further analysis is warranted to better understand the significance of the changes.

If you have any questions, please contact us.

Sincerely,

Dr. Xu
Team Leader  
Virus Reference Team  
Virus Surveillance and Diagnosis Branch  
Influenza Division, CDC

Dr. Klimov
Deputy Director  
WHO Collaborating Center for Surveillance, Epidemiology and Control of Influenza  
Influenza Division, CDC