Medicines & Healthcare products Regulatory Agency

NIBSC Confidence in Biological Medicines

Influenza Reagent
Influenza Virus Infectious SAN-022 (A/California/122/2022) (H3N2)
NIBSC code: 23/234
Instructions for use
(Version 2.0, Dated 12/09/2024)

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1. INTENDED USE

Reagent 23/234 was prepared from SAN-022 (H3N2), a reassortant of A/California/122/2022 (H3N2) and A/Puerto Rico/8/34 (H1N1) , which was processed in 250µL volumes as liquid stock. The derivation and known passage history of 23/234 are 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 -70°C 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

N/A.

10. ACKNOWLEDGEMENTS

N/A.

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

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

Physical and Chemical properties	
Physical appearance: Clear liquid	Corrosive: No
Stable: Yes	Oxidising: No
Hygroscopic: No	Irritant: No
Flammable: No	Handling: See caution, Section 2
Other (specify): Live influenza virus	

Toxicological properties	
Effects of inhalation:	Likelihood of influenza virus, avoid inhalation
Effects of ingestion:	Not established, avoid ingestion
Effects of skin absorption:	Not established, avoid contact with skin

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.

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Potters Bar, Hertfordshire, EN6 3QG. T +44 (0)1707 641000, nibsc.org
WHO International Laboratory for Biological Standards,
UK Official Medicines Control Laboratory

Action on Spillage and Method of Disposal
Spillage of ampoule 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 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

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: 0.25g per vial
Toxicity Statement: Non-toxic
Veterinary certificate or other statement if applicable. **Attached:** No

Passage history of SAN-022 (H3N2)

Cumulative number of passages	Passage numbers at each stage	Lot	Laboratory
E4	E4	3030726630	CDC, USA
E12	E4/E8	SP-2023-022	Sanofi, USA
E13	E4/E8/E1	48000*	MHRA, UK

* The HA titre of this virus using 0.7% Guinea-pig red blood cells is 1024. The infectious titre is unknown.

Sterility: no visible contamination was detected in a variety of media (tryptone soya broth, thioglycolate broth, Saboraud's broth and blood agar plates) after 14 days incubation.

The HA and NA sequence of this virus are available at GISAID with the accession number EPI_ISL_18932879.

Derivation of SAN-022

A/California/122/2022 High Growth Reassortant

A/California/122/2022 (SAN-022) is an H3N2 high growth reassortant influenza virus

A/California/122/2022 (SAN-022) is an H3N2 high growth reassortant influenza virus developed in Sanofi Flu Reassortant Lab, department Bacterial and Viral Technology at Sanofi, US.

Sanofi Lot #: SP-2023-022

Wildtype Virus:

A/California/122/2022 (the virus isolate was obtained from the CDC)

CDC Lot #: 3030726630

Passages prior to receipt from CDC: 4

Donor Virus:

A/Puerto Rico/8/1934 (SP Lot # Batch 2)

Eggs:

Specific Pathogen Free (SPF) premium eggs were used for all passages.

Antiserum:

Rabbit antisera raised against influenza virus A/Puerto Rico/8/1934 was used in the process.

Passage History

	wt Amplification	A/California/122/2022 (H3N2) wt virus amplified from source @ 10^{-5} dilution	HA titer GP: 2560
	Co-infection passage	A/California/122/2022 (H3N2) wild type virus @ 10^{-2} x A/Puerto Rico/8/1934 (H1N1) @ 10^{-6}	HA titer GP: 10240
1	1st antiserum passage	Inoculum with A/Puerto Rico/8/1934 HANA antibodies @ 1:100 dilution	HA titer GP: 1280
2	2nd antiserum passage	Inoculum with A/Puerto Rico/8/1934 HANA antibodies @ 1:100 dilution	HA titer GP: 5120
3	3rd antiserum/1st limit dilution passage	Inoculum @ 10^{-1} with A/Puerto Rico/8/1934 HANA antibodies @ 1:50 dilution and diluted 10^{-4}	HA titer GP: 10240
4	4th antiserum/2nd limit dilution passage	Inoculum @ 10^{-2} with A/Puerto Rico/8/1934 HANA antibodies @ 1:50 dilution and diluted 10^{-5}	HA titer GP: 5120
5	3rd limit dilution passage	Inoculum @ 10^{-7}	HA titer GP: 10240
6	Final amplification	Inoculum @ 10^{-6}	HA titer GP: 5120

Passages prior to receipt from the CDC = 4

Total number of passages post co-infection = 6

Testing of A/California/122/2022 SAN-022

Test	Results		
Sterility	No growth on Thioglycolate Medium and Trypticase Soy Broth after 10 days.		
Infectivity	$10^{9.2}$ EID_{50}/ mL		
Gene Ratio Determined by qPCR and confirmed by NGS.	5:3 reassortant HA, NA & PB1 genes from A/California/122/2022. Internal genes PB2, PA, NP, M & NS from A/Puerto Rico/8/1934.		
	Gene	**A/Puerto Rico/8/1934**	**A/California/122/2022**
	HA		+
	NA		+
	PB2	+	
	PB1		+
	PA	+	
	NP	+	
	M	+	
	NS	+	
Final HA titer for A/California/122/2022 SAN-022 = 5120			
HA titers were determined using 1.0% guinea pig red blood cells at room temperature.			
HA-HPLC showed 1.7x increase compared to the original wildtype virus			

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