Medicines & Healthcare products Regulatory Agency

NIBSC Confidence in Biological Medicines

Non WHO Reference Material
Pertussis Antiserum (human) Panel
NIBSC code: 18/146
Instructions for use
(Version 2.0, Dated 23/01/2019)

This material is not for in vitro diagnostic use.

1. INTENDED USE

This panel can be used to assess and validate pertussis immunoassays or for other research purposes. This panel is NOT FOR IN VITRO DIAGNOSTIC USE.
This panel is NOT INTENDED for use as a calibrator or to derive the anti-pertussis antibody concentrations in human serum samples. For calibration of human pertussis serology assays, a WHO International Standard and Reference Reagent are available (NIBSC product codes 06/140 and 06/142 respectively).
Serological analysis by enzyme-linked immunosorbent assays (ELISAs) or multiplex immunoassays (MIA) have been widely used for the evaluation of antibody responses to pertussis vaccination and infection. Accuarate qunatification of antybody responses is essential for the comparison of both intra- and inter-laboratory estimates.
A panel of seven samples of freeze-dried human sera containing different concentrations of anti-pertussis toxin (PT) IgG was prepared from sera kindly donated by Drs Carl-Heinz Wirsing von König and Marion Riffelmann, HELIOS Klinikum, Krefeld, Germany, and the Centre of Biological Reference Materials in NIBSC [1]. Some samples were prepared previously [2]. This panel was then used in an external quality assessment scheme for pertussis serology [1]. Twenty-five laboratories in 23 couuntries quantified the concentrations of anti-PT IgG in the panel using their own routine diagnostic ELISA or MIAs. Only data from laboratories that followed the ECDC Guidance and Protocol for the serological diagnosis of Bordetella pertussis were used. Specifically, only data from assays that used purified pertussis toxin only as coating antigen were used [3].

2. CAUTION

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

The preparation contains material of human origin, and either the final product or the source materials, from which it is derived, have been tested and found negative for HBsAg, anti-HIV and HCV RNA. 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

Based on the results of the external quality assessment scheme for pertussis serology [1] the panel has the following estimated unitages for anti-pertussis toxin IgG:

Sample	A	B	C	D	E	F	G
Geometric mean (IU/ml)	<2	24	43	62	80	106	131

4. CONTENTS

Country of origin of biological material: United Kingdom.
Each ampoule contains the residue of either 0.5 or 1ml of pooled re-calcified human serum freeze dried on a five day cycle (starting shelf temperature -50°C) followed by back filling with high purity nitrogen before sealing. The ampoules contain no bacteriostat and the preparation should not be assumed as sterile.

5. STORAGE

Unopened ampoules should be stored at -20°C.
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

No attempt should be made to weigh out any portion of the freeze-dried material prior to reconstitution.
The entire contents of the ampoule of each member of the panel should be reconstituted using sterile distilled water in the following volumes:

Sample	A	B	C	D	E	F	G
Reconstitution volume (ml)	0.5	0.5	0.5	0.5	0.5	1.0	0.5

An initial dilution at 1/100 of this solution for IgG assay is suggested. However, this may vary with individual laboratories and a pilot study is recommended to choose the suitable dilution.

In-house experiences indicate that aliquots of the reconstituted panel could be used if they have been suitably stored at -20°C or -70°C. Since storage conditions can differ in individual laboratories, it is recommended that laboratories should carry out validation under their own storage conditions. Repeated freeze-thaw cycles of reconstituted antiserum should be avoided.

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.

Accelerated degradation studies performed suggest that this material will be stable when stored at the recommended storage temperature of -20˚C.

Users who have any data supporting any change in the characteristics of this material are encouraged to contact NIBSC.

9. REFERENCES

1. European Centre for Disease Prevention and Control. External quality assurance scheme for *Bordetella pertussis* serology 2016. ECDC website 2018. Available here
2. European Centre for Disease Prevention and Control. External quality assurance scheme for *Bordetella pertussis* serology 2013. ECDC website 2014. Available here
3. European Centre for Disease Prevention and Control. Guidance and Protocol for the serological diagnosis of human infection with *Bordetella pertussis*. Stockholm: ECDC; 2012

10. ACKNOWLEDGEMENTS

We gratefully acknowledge Drs Carl-Heinz Wirsing von König and Marion Riffelmann, HELIOS Klinikum, Krefeld, Germany for donation of the sera. We would like to express our thanks to Dr Paul Matejtschuk (NIBSC) for assistance in the determination of freeze-drying conditions and for moisture and oxygen determinations for the ampouled standard, and staff of CBRM

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

for assistance with the filling procedure. We would like to thank Prof Qiushui He and Alex-Mikael Barkoff (University of Turku, Finland), and Sabrina Bacci and Csaba Ködmön (European Centre for Disease Prevention and Control, Sweden) for their assistance in organising the studies that were used to assigned units to the panel. We also thank all of the participants for their helpful contributions to the studies.

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: Freeze-dried powder		Corrosive:	No
Stable:	Yes	Oxidising:	No
Hygroscopic:	No	Irritant:	No
Flammable:	No	Handling:	See caution, Section 2
Other (specify):	Contains Material of Human Origin		

Toxicological properties	
Effects of inhalation:	Not established, 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.

Action on Spillage and Method of Disposal
Spillage of 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

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: 1.0 - 2.0 g
Toxicity Statement: Non-toxic
Veterinary certificate or other statement if applicable**.** **Attached:** No

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