



**WHO International Standard
Insulin-like Growth Factor-I, recombinant, human, 2nd
International Standard
NIBSC code: 19/166
Instructions for use
(Version 1.0, Dated 10/11/2020)**

1. INTENDED USE

The WHO International Standard for Insulin-like Growth Factor-I (IGF-I), recombinant, human, is the primary reference material for the calibration of IGF-I immunoassays. This preparation, coded 19/166, containing recombinant human IGF-I, was ampouled and evaluated for its suitability to serve as a WHO International Standard by international collaborative study. It was established as the 2nd International Standard for Insulin-like growth factor-I, recombinant, human, by the Expert Committee for Biological Standardization of the World Health Organization in October 2020. It replaces the 1st International Standard, for Insulin-like growth factor-I (IGF-I), recombinant, human, coded 02/254.

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

An ampoule of 19/166 contains 33.0 µg of IGF-I per ampoule (by definition) This value has an expanded uncertainty of 30.5-35.6 µg per ampoule ($k=2.36$).

4. CONTENTS

Country of origin of biological material: France.

Each ampoule contains the residue after freeze-drying of 0.5 ml of a solution that contained:

recombinant human IGF-I
10 mg trehalose
20 µmol sodium phosphate pH 7.0

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 manufacturers 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

For all practical purposes, each ampoule of reagent contains the same quantity of the substances listed above. Depending upon intended use, dissolve the total contents of the ampoule in a known volume of a suitable

diluent (distilled water, saline or buffer) with carrier protein (0.05 – 0.1% BSA or HSA) where extensive dilution is required. The ampoules do not contain bacteriostat and solution of the reagent should not be assumed to be sterile.

8. STABILITY

The stability of this International Standard was predicted via an accelerated thermal degradation (ATD) study, in which ampoules of 19/166 stored at elevated temperatures (4, 20, 37 and 45°C) for 9-12 months were analysed by HPLC and immunoassay. By immunoassay, no significant losses of potency were observed in samples stored at elevated temperatures for 9 months, relative to the reference storage temperature of -20°C, thus it was not possible to predict the long-term stability of the material by this method. By HPLC, observed losses in potency in samples stored at elevated temperatures for 12 months, relative to the reference storage temperature of -20°C, were fitted to the Arrhenius Equation, yielding a prediction that no loss of activity will occur in this preparation upon long-term storage at -20°C. These results indicate that 19/166 is likely to be highly stable under long term storage conditions at -20°C, and that the material will also be stable during normal shipping at ambient temperatures.

NIBSC follows the policy of WHO with respect to its reference materials. It is the policy of WHO not to assign an expiry date to their international reference materials. They remain valid with the assigned potency and status until withdrawn or amended. Reference materials are held at NIBSC within assured, temperature-controlled storage facilities. Reference Materials should be stored on receipt as indicated on the label. In addition, once reconstituted, diluted or aliquoted, users should determine the stability of the material according to their own method of preparation, storage and use. Users who have data supporting any deterioration in the characteristics of any reference preparation are encouraged to contact NIBSC.

9. REFERENCES

This standard was produced under WHO guidelines cited in the WHO Technical Reports Series, No. 932, 2006, Annex 2.

Ben Cowper, Katherine Partridge, Melanie Moore, Peter Rigsby and Chris Burns. Proposed 2nd WHO International Standard for insulin-like growth factor-I (IGF-I), recombinant, human (2020).
<https://www.who.int/publications/m/item/WHOB2020-2393>

10. ACKNOWLEDGEMENTS

We gratefully acknowledge the important contributions of all the participants in the collaborative study, Ipsen Biopharm Ltd, who donated the bulk material, and the Centre for Biological Reference Materials, NIBSC for preparation and dispatch of the ampouled materials.

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):	Can react with oxidising materials. Avoid contact with acids and alkalis.
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 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

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: 10 mg
Toxicity Statement: Non-toxic
Veterinary certificate or other statement if applicable.
Attached: No

17. CERTIFICATE OF ANALYSIS

NIBSC does not provide a Certificate of Analysis for WHO Biological Reference Materials because they are internationally recognised primary reference materials fully described in the instructions for use. The reference materials are established according to the WHO Recommendations for the preparation, characterization and establishment of international and other biological reference standards http://www.who.int/bloodproducts/publications/TRS932Annex2_Inter_biol_efstandardsrev2004.pdf (revised 2004). They are officially endorsed by the WHO Expert Committee on Biological Standardization (ECBS) based on the report of the international collaborative study which established their suitability for the intended use.