WHO International Standard
Follicle Stimulating Hormone (FSH), Human, Recombinant, For
Immunoassay
NIBSC code: 92/510
Instructions for use
(Version 3.0, Dated 23/01/2008)

1. INTENDED USE
This consists of a batch of ampoules (coded 92/510) containing highly
purified human recombinant follicle stimulating hormone obtained from
Chinese hamster ovary cells. It was established as the First International
Standard for Follicle Stimulating Hormone, human recombinant, for
immunoassay by the Expert Committee on Biological Standardization of
the World Health Organisation at its forty eighth meeting in 1997 (1). It is
intended for use in calibration of preparations of FSH by immunoassay.

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
This preparation has been assigned a unitage of 60 International Units per
ampoule.

4. CONTENTS
Country of origin of biological material: United Kingdom.
Each ampoule contains the residue, after freeze drying, of 1ml of a
solution which contained:

- rDNA-derived human FSH approx 10 µg
- Human plasma albumin 2mg
- Mannitol 10mg
- Sodium chloride 15.4mM

5. STORAGE
Unopened ampoules should be stored at –20ºC.

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.  Tap the
ampoule gently to collect the material at the bottom (labeled)
end. Ensure that the disposable ampoule safety breaker provided is
pushed down on the stem of the ampoule and against the shoulder of
the ampoule body. Hold the body of the ampoule in one hand and the
disposable ampoule breaker covering the ampoule stem between the
thumb and first finger of the other hand. Apply a bending force to open
the ampoule at the coloured stress point, primarily using the hand
holding the plastic collar.

Care should be taken to avoid cuts and projectile glass fragments that
might enter the eyes, for example, by the use of suitable gloves and an
eye shield. Take care that no material is lost from the ampoule and no
glass falls into the ampoule. Within the ampoule is dry nitrogen gas at
slightly less than atmospheric pressure. A new disposable ampoule
breaker is provided with each DIN ampoule.

7. USE OF MATERIAL
For practical purposes each ampoule contains the same amount of the same
materials. Dissolve all the contents in a known amount of buffer solution. No attempt should be made to weigh portions of the freeze-dried powder.

The material has not been sterilised and contains no bacteriostat.

8. COLLABORATIVE STUDY
This preparation was evaluated by International Collaborative study involving
27 laboratories in 12 countries. It was compared with the second IRP for
FSH and LH (in ampoules coded 78/549) in a variety of immunoassay
systems and with other current and candidate International Standards in a
range of in vivo and in vitro bioassay systems. The assigned unitage was
derived from the geometric mean of all laboratory means from
immunoassays only. It should be noted that there exists a discontinuity of
unitage between the activity obtained by immunoassay and that obtained by
in vivo bioassay and this preparation with its assigned unitage should be
considered as a standard for the calibration of immunoassays only. This
material was subsequently evaluated independently by UK NEQAS with this
assigned value.

The results of the above studies indicated that the preparation in ampoules
coded 92/510 was adequately stable and suitable to act as an International
Standard for the calibration of immunoassays. The assigned unitage does not represent a formal calibration of 92/510 in terms of 78/549 but does
maintain an approximate continuity of unitage which is hoped to be
acceptable to users of earlier preparations.

This preparation was therefore established as the First International
Standard for Follicle Stimulating Hormone, human for immunoassays with an
assigned unitage of 60 IU per ampoule by the Expert Committee on
Biological Standardization of WHO at its meeting in 1997.

9. STABILITY
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. For information specific to a particular
biological standard, contact standards@nibsc.ac.uk. 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.

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

Users who have data supporting any deterioration in the characteristics of
any reference preparation are encouraged to contact NIBSC.

10. REFERENCES

11. FURTHER INFORMATION
Further information can be obtained as follows:
This material: enquiries@nibsc.org
WHO Biological Standards:
http://www.who.int/biologics/en/
JCTLM Higher order reference materials:
http://www.bipm.org/en/committees/jc/jctlm/
Derivation of International Units:
http://www.who.int/biologicals/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>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical appearance: White lyophilised powder</td>
<td>Corrosive: No</td>
</tr>
<tr>
<td>Stable: Yes</td>
<td>Oxidising: No</td>
</tr>
<tr>
<td>Hygroscopic: Yes</td>
<td>Irritant: No</td>
</tr>
<tr>
<td>Flammable: No</td>
<td>Handling: See caution, Section 2</td>
</tr>
<tr>
<td>Other (specify): Contains material of human origin. Can react with oxidising materials. Avoid contact with acids and alkalis.</td>
<td></td>
</tr>
</tbody>
</table>

Toxicological properties

| Effects of inhalation: | No adverse effects reported for this material. |
| Effects of ingestion: | No adverse effects reported for this material. |
| Effects of skin absorption: | No adverse effects reported for this material. |

Suggested First Aid

| Inhalation: | Remove from exposure |
| Ingestion: Wash mouth thoroughly with water |
| 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: 13mg |
| 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_esstandardsrev2004.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.