

Androstane-diol Glucuronide ELISA

Enzyme immunoassay for the direct quantitative determination of
Androstane-diol Glucuronide in human serum.

REF **DB52171**

Σ **96**

   **2-8°C**

EU: **IVD**  U.S.: *For research use only.
Not for use in diagnostic procedures.*



1. INTENDED USE

For the direct quantitative determination of 5 α -Androstane-3 α ,17 β -diol Glucuronide (3 α Diol G) by enzyme immunoassay in human serum. For in vitro diagnostic use only.

2. PRINCIPLE OF THE TEST

The principle of the following enzyme immunoassay test follows the typical competitive binding scenario. Competition occurs between an unlabeled antigen (present in standards, control and patient samples) and an enzyme-labelled antigen (conjugate) for a limited number of antibody binding sites on the microwell plate. The washing and decanting procedures remove unbound materials. After the washing step, the enzyme substrate is added. The enzymatic reaction is terminated by addition of the stopping solution. The absorbance is measured on a microtiter plate reader. The intensity of the colour formed is inversely proportional to the concentration of 3 α Diol G in the sample. A set of standards is used to plot a standard curve from which the amount of 3 α Diol G in patient samples and controls can be directly read.

3. CLINICAL APPLICATIONS

5 α -Androstane-3 α , 17 β -diol glucuronide is a C19 steroid and is either abbreviated as 3 α Diol G, 5 α Diol G or simply, α Diol G. It is produced mainly as a metabolite of testosterone and dihydrotestosterone (DHT). It is largely produced in target peripheral tissues such as the skin, especially around hair follicles. The stimulation by large amounts of 3 α Diol G leads to excessive hair formation, notably where hair is not normally present in women.

In recent years the interest in the measurement of this steroid has increased among clinical investigators studying women suffering from idiopathic hirsutism.

Among the steroids known to be precursors for 3 α Diol G are dehydroepiandrosterone (DHEA), dehydroepiandrosterone sulphate (DHEAS), dihydrotestosterone (DHT), androstenedione and testosterone. Only 3 α Diol G has been shown to increase with hirsutism and decrease with treatment. This correlation has also been demonstrated in patients with polycystic ovarian syndrome (PCO). 3 α Diol G determinations have therefore proved to be a useful indicator in a variety of ways including monitoring the progress of treatment of idiopathic hirsutism and women with PCO.

Furthermore, diabetic patients (both men and women) under cyclosporine A therapy have shown increased 3 α Diol G levels, a side effect resulting in the appearance of hair in previously hairless areas.

4. PROCEDURAL CAUTIONS AND WARNINGS

1. Users should have a thorough understanding of this protocol for the successful use of this kit. Reliable performance will only be attained by strict and careful adherence to the instructions provided.
2. Control materials or serum pools should be included in every run at a high and low level for assessing the reliability of results.
3. When the use of water is specified for dilution or reconstitution, use deionized or distilled water.
4. In order to reduce exposure to potentially harmful substances, gloves should be worn when handling kit reagents and human specimens.
5. All kit reagents and specimens should be brought to room temperature and mixed gently but thoroughly before use. Avoid repeated freezing and thawing of reagents and specimens.
6. A calibrator curve must be established for every run.
7. The control should be included in every run and fall within established confidence limits.
8. Improper procedural techniques, imprecise pipetting, incomplete washing as well as improper reagent storage may be indicated when assay values for the control do not reflect established ranges.
9. When reading the microplate, the presence of bubbles in the microwells will affect the optical densities (ODs). Carefully remove any bubbles before performing the reading step.
10. The substrate solution (TMB) is sensitive to light and should remain colourless if properly stored. Instability or contamination may be indicated by the development of a blue colour, in which case it should not be used.
11. When dispensing the substrate and stopping solution, do not use pipettes in which these liquids will come into contact with any metal parts.
12. To prevent contamination of reagents, use a new disposable pipette tip for dispensing each reagent, sample, standard and control.
13. Do not mix various lot numbers of kit components within a test and do not use any component beyond the expiration date printed on the label.
14. Kit reagents must be regarded as hazardous waste and disposed of according to national regulations.

5. LIMITATIONS

1. All the reagents within the kit are calibrated for the direct determination of 3 α Diol G in human serum. The kit is not calibrated for the determination of 3 α Diol G in saliva, plasma or other specimens of human or animal origin.
2. Do not use grossly hemolyzed, grossly lipemic, icteric or improperly stored serum.
3. Any samples or control sera containing azide or thimerosal are not compatible with this kit, as they may lead to false results.
4. Only calibrator A may be used to dilute any high serum samples. The use of any other reagent may lead to false results.
5. The results obtained with this kit should never be used as the sole basis for a clinical diagnosis. For example, the occurrence of heterophilic antibodies in patients regularly exposed to animals or animal products has the potential of causing interferences in immunological tests. Consequently, the clinical diagnosis should include all aspects of a patient's background including the frequency of exposure to animals/products if false results are suspected.

6. SAFETY CAUTIONS AND WARNINGS

POTENTIAL BIOHAZARDOUS MATERIAL

Human serum that may be used in the preparation of the standards and control has been tested and found to be non-reactive for Hepatitis B surface antigen and has also been tested for the presence of antibodies to HCV and Human Immunodeficiency Virus (HIV) and found to be negative. However no test method can offer complete assurance that HIV, HCV and Hepatitis B virus or any infectious agents are absent. The reagents should be considered a potential biohazard and handled with the same precautions as applied to any blood specimen.

CHEMICAL HAZARDS

Avoid contact with reagents containing TMB, hydrogen peroxide and sulfuric acid. If contacted with any of these reagents, wash with plenty of water. TMB is a suspected carcinogen.

7. SPECIMEN COLLECTION AND STORAGE

Approximately 0.2 mL of serum is required per duplicate determination. Collect 4-5 mL of blood into an appropriately labelled tube and allow it to clot. Centrifuge and carefully remove the serum layer. Store at 4°C for up to 24 hours or at -10°C or lower if the analyses are to be done at a later date. Consider all human specimens as possible biohazardous materials and take appropriate precautions when handling.

8. SPECIMEN PRETREATMENT

This assay is a direct system; no specimen pretreatment is necessary.

9. REAGENTS AND EQUIPMENT NEEDED BUT NOT PROVIDED

1. Precision pipettes to dispense 50, 100, 150 and 300 μ L
2. Disposable pipette tips
3. Distilled or deionized water
4. Plate shaker
5. Microwell plate reader with a filter set at 450 nm and an upper OD limit of 3.0 or greater* (see assay procedure step 10).

10. REAGENTS PROVIDED

MTP **1. Rabbit Anti-3 α Diol G Antibody Coated Microwell Plate-Break Apart Wells - Ready To Use.** Contents: One 96 well (12x8) polyclonal antibody-coated microwell plate in a resealable pouch with desiccant.

Storage: Refrigerate at 2-8°C

Stability: 12 months or as indicated on label.

ENZCONJ **2. 3 α Diol G-Horseradish Peroxidase (HRP) Conjugate Concentrate – X50**
Contents: 3 α Diol G-HRP conjugate in a protein-based buffer with a non-mercury preservative.

Volume: 300 μ L/vial

Storage: Refrigerate at 2-8°C

Stability: 12 months or as indicated on label.

Preparation: Dilute 1:50 in assay buffer before use (eg. 40 μ L of HRP in 2 mL of assay buffer).

If the whole plate is to be used dilute 240 μ L of HRP in 12mL of assay buffer. Discard any that is left over.

CAL **3. 3 α Diol G Calibrators - Ready To Use.**

Contents: Six vials containing 3 α Diol G in a protein-based buffer with a non-mercury preservative. Prepared by spiking buffer with a defined quantity of 3 α Diol G.

*Listed below are approximate concentrations, please refer to vial labels for exact concentrations.

| Calibrator | Concentration | Volume/Vial |
|--------------|---------------|-------------|
| Calibrator A | 0 ng/mL | 2.0 mL |
| Calibrator B | 0.25 ng/mL | 0.6 mL |
| Calibrator C | 1 ng/mL | 0.6 mL |
| Calibrator D | 3 ng/mL | 0.6 mL |
| Calibrator E | 10 ng/mL | 0.6 mL |
| Calibrator F | 50 ng/mL | 0.6 mL |

Storage: Refrigerate at 2-8°C

Stability: 12 months in unopened vials or as indicated on label. Once opened, the standards should be used within 14 days or aliquoted and stored frozen. Avoid multiple freezing and thawing cycles.

CONTROL **4. Controls - Ready To Use.**

Contents: Two vials containing 3 α Diol G in a protein-based buffer with a non-mercury preservative. Prepared by spiking buffer with a defined quantity of 3 α Diol G. Refer to vial label for expected value and acceptable range.

Volume: 0.6 mL/vial

Storage: Refrigerate at 2-8°C

Stability: 12 months in unopened vial or as indicated on label. Once opened, the control should be used within 14 days or aliquoted and stored frozen. Avoid multiple freezing and thawing cycles.

WASHBUF **5. Wash Buffer Concentrate - X10**

CONC Contents: One bottle containing buffer with a non-ionic detergent and a non-mercury preservative.

Volume: 50 mL/bottle

Storage: Refrigerate at 2-8°C

Stability: 12 months or as indicated on label.

Preparation: Dilute 1:10 in distilled or deionized water before use. If the whole plate is to be used dilute 50 mL of the wash buffer concentrate in 450 mL of water.

ASSAYBUF 6. Assay Buffer - Ready To Use*

Contents: One vial containing a protein-based buffer with a non-mercury preservative.

Volume: 15 mL/vial

Storage: Refrigerate at 2-8°C

Stability: 12 months or as indicated on label.

* *Warm to completely dissolve before use.*

TMB SUBS 7. TMB Substrate - Ready To Use.

Contents: One bottle containing tetramethylbenzidine and hydrogen peroxide in a non-DMF or DMSO containing buffer.

Volume: 16 mL/bottle

Storage: Refrigerate at 2-8°C

Stability: 12 months or as indicated on label.

TMB STOP 8. Stopping Solution - Ready To Use.

Contents: One vial containing 1M sulfuric acid.

Volume: 6 mL/vial

Storage: Refrigerate at 2-8°C

Stability: 12 months or as indicated on label.

11. ASSAY PROCEDURE

Specimen Pretreatment: None.

All reagents must reach room temperature before use. Calibrators, controls and specimen samples should be assayed in duplicate. Once the procedure has been started, all steps should be completed without interruption.

1. Prepare working solutions of the 3 α Diol G-HRP conjugate and wash buffer.
2. Remove the required number of microwell strips. Reseal the bag and return any unused strips to the refrigerator.
3. Pipette 50 μ L of each calibrator, control and specimen sample into correspondingly labelled wells in duplicate.
4. Pipette 100 μ L of the conjugate working solution into each well (We recommend using a multichannel pipette).
5. Incubate on a plate shaker (approximately 200 rpm) for 30 minutes at room temperature.
6. Wash the wells 3 times with 300 μ L of diluted wash buffer per well and tap the plate firmly against absorbent paper to ensure that it is dry (The use of a washer is recommended).
7. Pipette 150 μ L of TMB substrate into each well at timed intervals.
8. Incubate on a plate shaker for 10-15 minutes at room temperature (or until calibrator A attains dark blue colour for desired OD).
9. Pipette 50 μ L of stopping solution into each well at the same timed intervals as in step 7.
10. Read the plate on a microwell plate reader at 450 nm within 20 minutes after addition of the stopping solution.

* If the OD exceeds the upper limit of detection or if a 450 nm filter is unavailable, a 405 or 415 nm filter may be substituted. The optical densities will be lower, however, this will not affect the results of patient/control samples.

12. CALCULATIONS

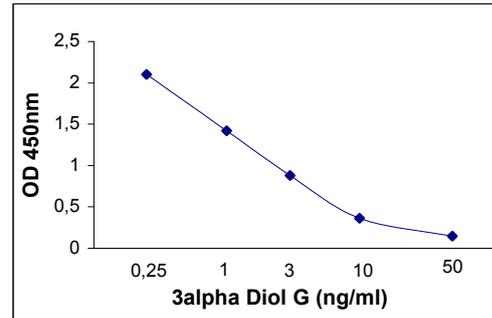
1. Calculate the mean optical density of each calibrator duplicate.
2. Draw a calibrator curve on semi-log paper with the mean optical densities on the Y-axis and the calibrator concentrations on the X-axis. If immunoassay software is being used, a 4-parameter curve is recommended.
3. Calculate the mean optical density of each unknown duplicate.
4. Read the values of the unknowns directly off the calibrator curve.
5. If a sample reads more than 50 ng/mL then dilute it with calibrator A at a dilution of no more than 1:8. The result obtained should be multiplied by the dilution factor.

TYPICAL TABULATED DATA

| Calibrator | OD 1 | OD 2 | Mean OD | Value (ng/mL) |
|------------|-------|-------|---------|---------------|
| A | 2.480 | 2.474 | 2.477 | 0 |
| B | 2.102 | 2.106 | 2.104 | 0.25 |
| C | 1.428 | 1.413 | 1.421 | 1 |
| D | 0.877 | 0.883 | 0.880 | 3 |
| E | 0.360 | 0.368 | 0.364 | 10 |
| F | 0.147 | 0.143 | 0.145 | 50 |
| Unknown | 0.598 | 0.596 | 0.597 | 5.4 |

TYPICAL CALIBRATOR CURVE

Sample curve only. Do not use to calculate results.



13. PERFORMANCE CHARACTERISTICS

SENSITIVITY

The lower detection limit is calculated from the standard curve by determining the resulting concentration of the mean OD of Calibrator A (based on 10 replicate analyses) minus 2 SD. Therefore, the sensitivity of the dbc Direct 3 α Diol G ELISA kit is 0.1 ng/mL.

SPECIFICITY (CROSS REACTIVITY)

The following compounds were tested for cross-reactivity with the Direct 3 α Diol G ELISA kit with 3 α Diol G cross-reacting at 100%.

| Steroid | %Cross Reactivity |
|-------------------|-------------------|
| 3 α Diol G | 100 |
| Testosterone | 0.2 |
| Progesterone | 0.16 |
| Androstenedione | 0.14 |
| Cortisol | 0.05 |

The following steroids were tested but cross-reacted at less than 0.01%: Corticosterone, Dehydroepiandrosterone, Dihydrotestosterone, Epiandrosterone, 17 β -Estradiol and Estrone.

INTRA-ASSAY PRECISION

Three samples were assayed ten times each on the same calibrator curve. The results (in ng/mL) are tabulated below:

| Sample | Mean | SD | CV% |
|--------|-------|------|-----|
| 1 | 0.87 | 0.07 | 7.8 |
| 2 | 6.86 | 0.49 | 7.2 |
| 3 | 21.26 | 1.29 | 6.0 |

INTER-ASSAY PRECISION

Three samples were assayed ten times over a period of four weeks. The results (in ng/mL) are tabulated below:

| Sample | Mean | SD | CV% |
|--------|-------|------|------|
| 1 | 0.98 | 0.10 | 10.4 |
| 2 | 7.05 | 0.46 | 6.5 |
| 3 | 20.92 | 2.26 | 10.8 |

RECOVERY

Spiked samples were prepared by adding defined amounts of 3 α Diol G to three patient serum samples. The results (in ng/mL) are tabulated below:

| Sample | Obs.Result | Exp.Result | Recovery% |
|------------|------------|------------|-----------|
| 1 Unspiked | 0.67 | - | - |
| +0.5 | 1.07 | 1.17 | 91.4 |
| +5.0 | 4.99 | 5.67 | 88.0 |
| +15.0 | 12.66 | 15.67 | 80.8 |
| 2 Unspiked | 1.83 | - | - |
| +0.5 | 2.07 | 2.33 | 88.8 |
| +5.0 | 6.18 | 6.83 | 90.5 |
| +15.0 | 17.64 | 16.83 | 104.8 |
| 3 Unspiked | 12.76 | - | - |
| +0.5 | 15.32 | 13.26 | 115.5 |
| +5.0 | 19.22 | 17.76 | 108.2 |
| +15.0 | 22.68 | 27.76 | 81.7 |

LINEARITY

Three patient serum samples were diluted with calibrator A. The results (in ng/mL) are tabulated below:

| Sample | Obs.Result | Exp.Result | Recovery% |
|--------|------------|------------|-----------|
| 1 | 6.24 | - | - |
| 1:2 | 2.83 | 3.12 | 90.7 |
| 1:4 | 1.55 | 1.56 | 99.4 |
| 1:8 | 0.74 | 0.78 | 94.9 |
| 2 | 13.55 | - | - |
| 1:2 | 6.00 | 6.77 | 88.6 |
| 1:4 | 2.71 | 3.39 | 80.0 |
| 1:8 | 1.70 | 1.64 | 103.6 |
| 3 | 17.05 | - | - |
| 1:2 | 6.93 | 8.53 | 81.2 |
| 1:4 | 4.09 | 4.26 | 96.0 |
| 1:8 | 2.34 | 2.13 | 109.8 |

EXPECTED NORMAL VALUES

As for all clinical assays each laboratory should collect data and establish their own range of expected normal values.

| Group | Range (ng/mL) |
|------------------|---------------|
| Males | 1.53-14.82 |
| Premenopausal | 0.22-4.64 |
| Postmenopausal | 0.61-3.71 |
| Puberty (Female) | 0.51-4.03 |

14. REFERENCES

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3. Moghissi, E., et al., Origin of plasma androstanediol glucuronide in men. *J. Clin. Endocrinol. Metab.* 59/3:417-421, 1984.
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Symbols / Symbole / Symbôles / Símbolos / Símbolos / Σύμβολα

| | |
|--|--|
|  | Cat.-No.: / Kat.-Nr.: / No.- Cat.: / Cat.-No.: / N.º Cat.: / N.-Cat.: / Αριθμός-Κατ.: |
|  | Lot-No.: / Chargen-Bez.: / No. Lot: / Lot-No.: / Lote N.º: / Lotto n.: / Αριθμός -Παραγωγή: |
|  | Use by: / Verwendbar bis: / Utiliser à: / Usado por: / Usar até: / Da utilizzare entro: / Χρησιμοποιείται από: |
|  | No. of Tests: / Kitgröße: / Nb. de Tests: / No. de Determ.: / N.º de Testes: / Quantità dei tests: / Αριθμός εξετάσεων: |
|  | Concentrate / Konzentrat / Concentré / Concentrar / Concentrado / Concentrato / Συμπύκνωμα |
|  | Lyophilized / Lyophilisat / Lyophilisé / Liofilizado / Liofilizado / Liofilizzato / Λυοφιλιασμένο |
|  | In Vitro Diagnostic Medical Device. / In-vitro-Diagnostikum. / Appareil Médical pour Diagnostics In Vitro. / Dispositivo Médico para Diagnóstico In Vitro. / Equipamento Médico de Diagnóstico In Vitro. / Dispositivo Medico Diagnostico In vitro. / Ιατρική συσκευή για In-Vitro Διάγνωση. |
|  | Evaluation kit. / Nur für Leistungsbewertungszwecke. / Kit pour évaluation. / Juego de Reactivos para Evaluació. / Kit de avaliação. / Kit di valutazione. / Κιτ Αξιολόγησης. |
|  | Read instructions before use. / Arbeitsanleitung lesen. / Lire la fiche technique avant emploi. / Lea las instrucciones antes de usar. / Ler as instruções antes de usar. / Leggere le istruzioni prima dell'uso. / Διαβάστε τις οδηγίες πριν την χρήση. |
|  | Keep away from heat or direct sun light. / Vor Hitze und direkter Sonneneinstrahlung schützen. / Garder à l'abri de la chaleur et de toute exposition lumineuse. / Manténgase alejado del calor o la luz solar directa. / Manter longe do calor ou luz solar directa. / Non esporre ai raggi solari. / Να φυλάσσεται μακριά από θερμότητα και άμεση επαφή με το φως του ηλίου. |
|  | Store at: / Lagern bei: / Stocker à: / Almacene a: / Armazenar a: / Conservare a: / Αποθήκευση στους: |
|  | Manufacturer: / Hersteller: / Fabricant: / Productor: / Fabricante: / Fabricante: / Παραγωγός: |
|  | Caution! / Vorsicht! / Attention! / ¡Precaución! / Cuidado! / Attenzione! / Προσοχή! |
| <p>Symbols of the kit components see MATERIALS SUPPLIED. Die Symbole der Komponenten sind im Kapitel KOMPONENTEN DES KITS beschrieben. Voir MATERIEL FOURNI pour les symbôles des composants du kit. Símbolos de los componentes del juego de reactivos, vea MATERIALES SUMINISTRADOS. Para símbolos dos componentes do kit ver MATERIAIS FORNECIDOS. Per i simboli dei componenti del kit si veda COMPONENTI DEL KIT. Για τα σύμβολα των συστατικών του κιτ συμβουλευτείτε το ΠΑΡΕΧΟΜΕΝΑ ΥΛΙΚΑ.</p> | |

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LIABILITY: Complaints will be accepted in each mode –written or vocal. Preferred is that the complaint is accompanied with the test performance and results. Any modification of the test procedure or exchange or mixing of components of different lots could negatively affect the results. These cases invalidate any claim for replacement. Regardless, in the event of any claim, the manufacturer's liability is not to exceed the value of the test kit. Any damage caused to the kit during transportation is not subject to the liability of the manufacturer