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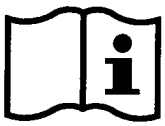

Useŕs Manual

Cortisol in urine ELISA

Enzyme Immunoassay for the quantitative determination of free cortisol in urine

IVD

CE

REF DE2989

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Demeditec Diagnostics GmbH • Lise-Meitner-Straße 2 • D-24145 Kiel (Germany)
Phone: +49 (0)431/71922-0 • Fax. +49 (0)431/71922-55
Email: info@demeditec.de • http://www.demeditec.com

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Please use only the valid version of the package insert provided with the kit.
Verwenden Sie nur die jeweils gültige, im Testkit enthaltene, Arbeitsanleitung.
Si prega di usare la versione valida dell'inserto del pacco a disposizione con il kit.
Por favor, se usa solo la version valida de la metodico técnico incluido aqui en el kit.

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1 INTENDED USE

Competitive immunoenzymatic colorimetric method for quantitative determination of free Cortisol concentration in Urine. Urinary Cortisol ELISA kit is intended for laboratory use only.

1.1 CLINICAL SIGNIFICANCE

Cortisol is a steroid hormone released from the adrenal cortex in response to an hormone called ACTH (produced by the pituitary gland), it is involved in the response to stress; it increases blood pressure, blood sugar levels, may cause infertility in women, and suppresses the immune system. Cortisol acts through specific intracellular receptors and has effects in numerous physiologic systems, including immune function, glucose-counter regulation, vascular tone, substrate utilization and bone metabolism. Cortisol is excreted primarily in urine in an unbound (free) form. Cortisol is bound, in plasma, from corticosteroid-binding globulin (CBG, transcotin), with high affinity, and from albumin. Only free cortisol is available to most receptors. These normal endogenous functions are the basis for the physiological consequences of chronic stress - prolonged cortisol secretion causes muscle wastage, hyperglycaemia, and suppresses immune / inflammatory responses. The same consequences arise from long-term use of glucocorticoid drugs. The free cortisol fraction represents the metabolically active cortisol. In normal conditions, less then 1% it comes excrete in urines. In pathological conditions (syndrome of Cushing) the levels of free urinary cortisol are elevate, because the CBG don't bound the plasmatic cortisol in excess and it was remove with urines. During pregnancy or estro-progestogen treatment an increase of plasmatic cortisol caused by an increment of the production of the transport protein, but the levels of free urinary cortisol results normal to indicate a correct surrenic functionality. This test is very useful to estimate the real surrenic function, because is dose the free cortisol, it is the metabolically active form. Moreover the measurement of free urinary cortisol is the better parameter for the diagnosis of the Cushing's syndrome.

2 PRINCIPLE

The Cortisol (antigen) in the sample competes with the antigenic Cortisol conjugated with horseradish peroxidase (HRP) for binding to the limited number of antibodies anti Cortisol coated on the microplate (solid phase). After incubation, the bound/free separation is performed by a simple solid-phase washing. Then, the enzyme HRP in the bound-fraction reacts with the Substrate (H_2O_2) and the TMB Substrate and develops a blue color that changes into yellow when the Stop Solution is added.
The colour intensity is inversely proportional to the Cortisol concentration of in the sample. Cortisol concentration in the sample is calculated through a calibration curve.

3 REAGENTS, MATERIALS AND INSTRUMENTATION

3.1 Reagents and materials supplied in the kit

1. **Zero Standard** (S0)**,** 4.0 mL
2. **Standards** (S1 – S4), 4 vials, 1.0 mL each
3. **Control Low,** 1 vial, 1.0 mL
   Ready to use
4. **Control High,** 1 vial, 1.0 mL
   Ready to use
5. **Enzyme Conjugate,** 1 vial, 33 mL
   Cortisol conjugated with horseradish peroxidase (HRP)
6. **Microtiterwells,** 1 breakable microplate
   Anti-Cortisol antibody adsorbed on microplate
7. **Substrate Solution,** 1 vial, 15 mL
   H_2O_2-TMB 0.26 g/L (avoid any skin contact)
8. **Stop Solution,** 1 vial, 15 mL
   Acidic solution 0.3 N (avoid any skin contact)
9. **Wash Solution** 10X Conc., 1 vial, 50 mL
   Phosphate buffer 0.2 M, Proclin < 0,0015%

3.2 Reagents necessary not supplied

- Distilled water

3.3 Auxiliary materials and instrumentation

- Automatic dispenser
- Microplate reader (450 nm, 620-630 nm)

Note
Store all reagents at 2 °C – 8 °C in the dark.
Open the bag of reagent 6 (Coated Microplate) only when it is at room temperature and close immediately after use.

4 WARNINGS

- This kit is intended for in vitro use by professional persons only. Not for internal or external use in Humans or Animals.
- Use appropriate personal protective equipment while working with the reagents provided.
- Follow Good Laboratory Practice (GLP) for handling blood products.
- Some reagents contain small amounts of Proclin 300 as preservative. Avoid the contact with skin or mucosa.
- The TMB Substrate contains an irritant, which may be harmful if inhaled, ingested or absorbed through the skin. To prevent injury, avoid inhalation, ingestion or contact with skin and eyes.
- The Stop Solution consists of a diluted acidic solution. Acidic solution is poisonous and corrosive and can be toxic if ingested. To prevent chemical burns, avoid contact with skin and eyes.
- Avoid the exposure of reagent TMB/H_2O_2 to directed sunlight, metals or oxidants. Do not freeze the solution.
- This method allows the determination of Cortisol from 10 ng/mL to 500 ng/mL.
- The clinical significance of the Cortisol determination can be invalidated if the patient was treated with corticosteroids or natural or synthetic steroids.

5 PRECAUTIONS

- Please adhere strictly to the sequence of pipetting steps provided in this protocol.
- All reagents should be stored refrigerated at 2 °C - 8 °C in their original container. Any exceptions are clearly indicated. The reagents are stable until the expiry date when stored and handled as indicated.
- Allow all kit components and specimens to reach room temperature (22 °C - 28 °C) and mix well prior to use.
- Do not interchange kit components from different lots. The expiry date printed on box and vials labels must be observed. Do not use any kit component beyond their expiry date.
- If you use automated equipment, the user has the responsibility to make sure that the kit has been appropriately tested.
- The incomplete or inaccurate liquid removal from the wells could influence the assay precision and/or increase the background.
- It is important that the time of reaction in each well is held constant for reproducible results. Pipetting of samples should not extend beyond ten minutes to avoid assay drift. If more than 10 minutes are needed, follow the same order of dispensation. If more than one plate is used, it is recommended to repeat the dose response curve in each plate
- Addition of the TMB Substrate solution initiates a kinetic reaction, which is terminated by the addition of the Stop Solution. Therefore, the TMB Substrate and the Stop Solution should be added in the same sequence to eliminate any time deviation during the reaction.
- Observe the guidelines for performing quality control in medical laboratories by assaying controls samples.
- Maximum precision is required for reconstitution and dispensation of reagents.
- Plate readers measure vertically. Do not touch the bottom of the wells.

6 PROCEDURE

6.1 Preparation of the Standard (S0 - S4)

Before use, leave 5 minutes on a rotating mixer.
The standards are ready to use and have the following concentration of Cortisol:

	S0	S1	S2	S3	S4
ng/mL	**0**	**10**	**50**	**150**	**500**

Once opened the standards are stable 6 months at 2 °C – 8 °C.

6.2 Preparation of Conjugate

The Conjugate is ready to use.
Once opened, it stable 6 months at 2 °C – 8 °C.

6.3 Preparation of the Sample

The determination of Cortisol with this kit should be performed in urine samples.
It is not necessary to dilute the sample.
The total volume of urine excreted during 24 hours should be collected and mixed in a single container.
Urine samples which are not to be assayed immediately should be stored at 2 °C – 8 °C or at -20 °C for longer periods.

Controls are ready to use.

In case of samples with concentration greater than 500 ng/mL dilute with Zero Standard (consider this dilution in the calculation of final concentration).

6.4 Preparation of Wash Solution

Dilute the content of each vial of the “Wash Solution" 10X concentrate with distilled water to a final volume of 500 mL prior to use.
For smaller volumes respect the 1:10 dilution ratio.
The diluted wash solution is stable for 30 days at 2 °C – 8 °C.
In concentrated wash solution is possible to observe the presence of crystals; in this case mix at room temperature until the complete dissolution of crystals; for greater accuracy, dilute the whole bottle of concentrated wash solution to 500 mL, taking care to transfer completely the crystals, then mix until crystals are completely dissolved.

6.5 Procedure

Allow all reagents to reach room temperature (22 °C - 28 °C).

Unused coated microwell strips should be released securely in the foil pouch containing desiccant and stored at 2 °C - 8 °C.
To avoid potential microbial and/or chemical contamination, unused reagents should never be transferred into the original vials.
As it is necessary to perform the determination in duplicate in order to improve accuracy of the test results, prepare two wells for each point of the calibration curve (S0-S4), two for each Control, two for each sample, one for Blank.

Reagent	Standards	Samples/Controls	Blank
Standard S0-S4	10 µL		
Samples/Controls		10 µL	
Conjugate	300 µL	300 µL	
Incubate at 37 °C for 1 hour. Remove the contents from each well; wash the wells **3 times with 350 µL** of diluted wash solution. **Important note:** during each washing step, gently shake the plate for 5 seconds and remove excess solution by tapping the inverted plate on an absorbent paper towel. Automatic washer: in case you use an automatic washer, it is advised to do 6 washing steps..			
Substrate Solution	100 µL	100 µL	100 µL
Incubate at room temperature (22 °C – 28 °C) for 15 minutes in the dark			
Stop Solution	100 µL	100 µL	100 µL
Shake the microplate gently. Read the absorbance (E) at 450 nm against a reference wavelength of 620-630 nm or against Blank within 5 minutes.			

7 QUALITY CONTROL

Each laboratory should assay controls at normal, high and low levels range of Urinary Cortisol for monitoring assay performance. These controls should be treated as unknowns and values determined in every test procedure performed. Quality control charts should be maintained to follow the performance of the supplied reagents. Pertinent statistical methods should be employed to ascertain trends. The individual laboratory should set acceptable assay performance limits. Other parameters that should be monitored include the 80, 50 and 20% intercepts of the standard curve for run-to-run reproducibility. In addition, maximum absorbance should be consistent with past experience. Significant deviation from established performance can indicate unnoticed change in experimental conditions or degradation of kit reagents. Fresh reagents should be used to determine the reason for the variations.

8 RESULTS

8.1 Mean Absorbance

Calculate the mean of the absorbance (Em) for each point of the standard curve and of each sample

8.2 Standard Curve

Plot the values of absorbance (Em) of the standards (S0-S4) against concentration. Draw the best-fit curve through the plotted points (e.g.: Four Parameter Logistic).

8.3 Calculation of Results

Interpolate the values of the samples on the standard curve to obtain the corresponding values of the concentrations expressed in ng/mL.

To calculate the cortisol concentration in urine, calculate as above and correct for total volume of volume of urine collected in 24 hours:

ng/mL x Vol (mL) urine 24 h/ 1000 = µg Cortisol/24 h

9 REFERENCE VALUES

The urinary Cortisol concentration during the 24 hours are included in the following range:

50 µg – 190 µg/24 hours

10 PERFORMANCE AND CHARACTERISTICS

10.1 Precision

10.1.1 Intra-Assay Variation

Within run variation was determined by replicate measurements (20x) of three different urine samples in one assay. The within assay variability is ≤ 6.5 %.

10.1.2 Inter-Assay Variation

Between run variation was determined by replicate measurements (10x) of three different urine samples in different lots of kit. The between assay variability is ≤ 7.2 %.

10.2 Accuracy

The recovery of 12.5 - 25 - 50 - 100 ng/mL of Cortisol added to a sample gave an average value (±SD) of 107.48 % ± 8.16 % with reference to the original concentrations.

10.3 Sensitivity

The lowest detectable concentration of urinary cortisol that can be distinguished from the Standard 0 is 2.95 ng/mL at the 95 % confidence limit.

10.4 Specificity

The cross reaction of the antibody calculated at 50% according to Abraham are shown in the table:

Cortisol	100 %
Prednisolone	46.2 %
11-Deoxycortisol	4 %
Cortisone	3.69 %
Prednisone	3.10 %
11αOH Progesterone	1 %
Progesterone	< 0.1 %
Aldosterone	< 0.1 %
Pregnenolone	< 0.1 %
17b Estradiol	< 0.1 %
Estrone 3-solfato	< 0.1 %
Estriol	< 0.1 %
Testosterone	< 0.1 %
Spironolactone	< 0.1 %
DHEA	< 0.1 %
DHEA-S	< 0.1 %
Androstenedione	< 0.1 %
Androsterone	< 0.1 %
DHT	< 0.1 %
Danazol	< 0.1 %
Cholesterol	< 0.1 %
Dexamethasone	< 0.1 %

10.5 Correlation with RIA

The Urinary Cortisol ELISA (DE2989) was compared to another commercially available Urinary Cortisol assay. 100 urine samples were analysed.
The linear regression curve was calculated:

$Y = 0.90x + 9.95$
$r^2 = 0.836$

11 WASTE MANAGEMENT

Reagents must be disposed off in accordance with local regulations.

12 BIBLIOGRAPHY

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4. Kobayashi, Y., et al Steroids, 32 no 1(1978)
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13 TROUBLESHOOTING

ERRORS / POSSIBLE CAUSES / SUGGESTIONS

No colorimetric reaction

- no conjugate pipetted
- contamination of conjugates and/or of substrate
- errors in performing the assay procedure (e.g. accidental pipetting of reagents in a wrong sequence or from the wrong vial, etc.)

Too low reaction (too low ODs)

- incorrect conjugate (e.g. not from original kit)
- incubation time too short, incubation temperature too low

Too high reaction (too high ODs)

- incorrect conjugate (e.g. not from original kit)
- incubation time too long, incubation temperature too high
- water quality for wash buffer insufficient (low grade of deionization)
- insufficient washing (conjugates not properly removed)

Unexplainable outliers

- contamination of pipettes, tips or containers
- insufficient washing (conjugates not properly removed)

<u>too high within-run CV%</u>

- reagents and/or strips not pre-warmed to room temperature prior to use
- plate washer is not washing correctly (suggestion: clean washer head)

<u>too high between-run CV %</u>

- incubation conditions not constant (time, temperature)
- controls and samples not dispensed at the same time (with the same intervals) (check pipetting order)
- person-related variation

SYMBOLS USED WITH DEMEDITEC ASSAYS

Symbol	English	Deutsch	Français	Español	Italiano
	Consult instructions for use	Gebrauchsanweisung beachten	Consulter les instructions d'utilisation	Consulte las instrucciones de uso	Consultare le istruzioni per l'uso
	European Conformity	CE-Konfirmitäts-kennzeichnung	Conformité aux normes européennes	Conformidad europea	Conformità europea
	In vitro diagnostic device	In-vitro-Diagnostikum	Usage Diagnostic in vitro	Para uso Diagnóstico in vitro	Per uso Diagnostica in vitro
	For research use only	Nur für Forschungs-zwecke	Seulement dans le cadre de recherches	Sólo para uso en investigación	Solo a scopo di ricerca
	Catalogue number	Katalog-Nr.	Numéro de catalogue	Número de catálogo	Numero di Catalogo
	Lot. No. / Batch code	Chargen-Nr.	Numéro de lot	Número de lote	Numero di lotto
	Contains sufficient for <n> tests/	Ausreichend für "n" Ansätze	Contenu suffisant pour "n" tests	Contenido suficiente para <n> ensayos	Contenuto sufficiente per "n" saggi
	Storage Temperature	Lagerungstemperatur	Température de conservation	Temperatura de conservación	Temperatura di conservazione
	Expiration Date	Mindesthaltbarkeits-datum	Date limite d'utilisation	Fecha de caducidad	Data di scadenza
	Legal Manufacturer	Hersteller	Fabricant	Fabricante	Fabbricante
Distributed by	Distributor	Vertreiber	Distributeur	Distribuidor	Distributore
Content	Content	Inhalt	Conditionnement	Contenido	Contenuto
Volume/No.	Volume / No.	Volumen/Anzahl	Volume/Quantité	Volumen/Número	Volume/Quantità