Ceruloplasmin (CER) – Turbidimetric method

For Konelab - Indiko® systems

Instructions for Use (IFU)

IVD CE

ORDERING INFORMATION

Format	Code	Composition
Kit 1 x 40mL – 1 x 6 mL	REF B78182261	n° 1 vial x 40 mL R:A n° 1 vial x 6 mL R:B n°1 vial x 60 mL R.C

* in case of use on Indiko Analyser transfer the content into the additional empty vial

INTENDED USE

Diagnostic immunoturbidimetric test for the quantitative determination IVD of Ceruloplasmin (CER) in human serum and plasma. All results must be interpreted in conjunction with the clinical context. FOR PROFESSIONAL USE ONLY.

CLINICAL SIGNIFICANCE

Ceruloplasmin (CER) is a 150 KD glycoprotein able to bind reversibly, up to eight atoms of copper per molecule. In the oxidated state, the protein acquires a deep green-blue colour caused by the copper molecules which have been bound.CER is the principle protein transporting copper, and binds up to 96% of the serum copper concentration.
CER also shows enzymatic activities similar to a ferroxidase, superoxidodismsutase and amino-oxidase.
The clinical interest in the determination of CER derives from the fact that this protein is part of the group of "acute phase proteins" which includes alpha-1-glycoprotein, ceruloplasmin, haptoglobin in addition to fibrinogen and C-reactive protein. In view of their different behaviour over a given period, in order to obtain a complete picture of the course of the disease it is advisable to perform the determination of the whole group of these proteins, thus otaining a "profile of the acute phase proteins".
Serum levels are increased during pregnancy and in patients treated with exogenous estrogens. More or less marked increases are also seen in cases of lymphogranuloma, hyperthyroidism, hepatic cyrrhosis, myocardial infart and tissue necrosis in general, during inflammatory processes particularly during the acute phase. Marked increases are also seen in rheumatoid arthritis.

PRINCIPLE OF THE METHOD

Immunoturbidimetric method. The CER contained in the test sample reacts with the specific antibodies, resulting in immunocomplexes. The turbidity formed in this way is read photometrically at λ 340nm and it is proportional to the CER concentration in the sample. The quantitative analysis is obtained by interpolation of this photometric value with those found by testing known concentrations of CER.

Storage and stability

= **Storage temperature 2-8 °C**

If stored at 2-8°C avoiding direct light, the intact reagents remain stable until the expiration date, printed on the label. Slight variations in composition among batches will not affect test results.

Concentrations

Reagent A			
		Conc.	**U.M.**
Protein Buffer	TRIS	0.05	mol/L
	PEG	5	%
	NaN_3	< 0.1	%
Reagent B			
CEI Goat antiserum	NaN_3	< 0.1	%
Reagent C			
Sample Diluent	PBS	0,015	mol/L
	NaN_3	< 0,1	%

Materials included in the kit
Reagent as described above.
Necessary materials not included in the kit
Controls and calibrators.

PRECAUTIONS and WARNINGS

1. Reagents and waste materials shall be disposed of in accordance with Community waste provisions or national or regional provisions.
2. Reagents may contain non-active components such as preservatives and detergents. The total concentration of these components is below the limits set out in Regulation 1272/2008 EC and subsequent amendments and additions.
3. It is recommended that the reagent be handled in accordance with the rules of good laboratory practice and that appropriate personal protective equipment be used.
4. Do not use the reagent if it is visibly degraded (e.g. presence of corpuscles).
5. All human samples shall be handled and disposed of as potentially infectious material.
6. The kit should only be used by qualified and properly trained technical personnel.
7. Diagnoses shall be carried out exclusively by authorised and qualified personnel.
8. Comply with national directives on occupational safety and quality assurance.
9. Use equipment that complies with current regulations.

Reporting of serious incidents

In the event of a serious incident in relation to the use of the device, please inform the manufacturer (via your distributor) and the competent authority of the European Union member state where the incident occurred. For other jurisdictions, reporting must be made in accordance with regulatory requirements. Reporting serious incidents helps provide more information about the safety of the diagnostic medical device.

PREPARATION OF THE REAGENT

The Reagents are liquid, ready for use. After opening, the Reagents are stable until the expiry date if kept as indicated in "Storage and stability".

PROCEDURE

Quality Control

Use the Sclavo Diagnostics Int. Control Sera for specific Proteins Low REF B47182064 and High REF B47182065 for your quality control purposes at least once a day. Repeat the analysis also after calibration. Obtained values must be within the range of acceptability.

ANALYTICAL TECHNIQUE

For automatic procedures, consult the instruction manual and applicable notes for the Konelab® - Indiko®. analyzers. All applications not specifically approved by Sclavo Diagnostics Int. cannot be guaranteed in terms of performance and must be evaluated by the user.

Calibration

For calibration, use the Sclavo Diagnostics Int. Specific Proteins Single Level Calibrator REF B47182273, in accordance with methodology applying to Konelab® - Indiko® series.

Traceability

The CER value has been determined according to the IRMM using the reference material CRM470/RPPHS.

SAMPLE

Sample types and storage

Serum or plasma obtained by normal medical techniques can be used. No special preparation of the patient is necessary.
The samples must be pre-diluted 1:10 before analysis.
Strongly lipemic samples or those which present a high degree of turbidity or precipitates must be clarified by centrifugation (10 min. at 15,000xg), before testing.

Calculation of results on Konelab® - Indiko® systems

Results are automatically calculated by analyzer based on the calibration curve. The analyzer automatically performs serial dilutions from a primary standard according to the method protocol. The calibration curve is obtained by interpolating the values obtained with an appropriate algorithm.

REFERENCE RANGE

The typical reference range is 0.20 g/L a 0.60 g/L.
As sex, age, geographical location and other factors can influence the normal values found in the population, each laboratory should determine its own normal, medium and pathological values for its own population.

CHARACTERISTICS/PERFORMANCE

Analytical Range – Antigen excess

The analytical range was tested using a strongly positive sample and serial dilutions of this serum in saline solution. The method guarantees a correct response throughout the minimal detectable measurement range and the calibrator higher concentration.
The present method does not show Antigen Excess until 9.2 g/L.

Trueness

The Trueness of the analytical results has been determined according to the CLSI EP15-A2 guideline, using commercial control sera. The data obtained are shown in the following table (confidence interval 95%).

Level	Replicates	Mean (g/L)	SD	CV%
Low	25	0.226	0.0051	2.2
High	25	0.687	0.0143	2.1

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Specificity
The method is 100% specific for human CER

Interferences
The influence of the following substances on the analytical response was tested up to the concentrations reported below:
Bilirubin 50 mg/dL, Ascorbic Acid 50 mg/dL, EDTA 10 mM, Hemoglobin 500 mg/dL, Sodium citrate 1000 mg/dL, Sodium Heparin 40 mg/mL, Triglycerides 2%, Rheumatoid Factor 2000 IU/mL.
No appreciable interference was found in any case, and the variations observed were within the expected precision range. Higher concentrations were not tested.
However, in view of the wide heterogeneity of potentially interfering substances and pharmaceuticals, for diagnostic purposes the results of this test must always be taken into consideration in conjunction with the clinical history of the patient, other clinical tests and medical investigations.

Precision
The Precision of the analytical results has been determined as Repeatability and Total Precision according to the CLSI EP15-A2 guideline, using commercial control sera. The data obtained are shown in the following table (confidence interval 95%).

Within-run Precision – Repeatability				
Level	**Replicates**	**Mean (g/L)**	**DS**	**CV%**
Low	25	0.226	0.002	0.9
High	25	0.687	0.007	1.1
Total Precision (Within-lab Precision)				
Level	**Replicates**	**Mean (g/L)**	**DS**	**CV%**
Low	25	0.226	0.005	2.4
High	25	0.687	0.015	2.2

Limits of sensitivity
The Sensitivity limit has been measured using serial dilutions of a high concentrated serum. The smallest measurable concentration is 0.02 g/L.

Comparison between methods
The present method was compared with another commercially available method following the guidelines of the CLSI EP09-A2-IR, analyzing 59 human sera with a concentration between 0.16 e 0.465 g/L. The correlation data between the two methods are reported in the table below.

Parameter	Estimation
Intercept	0.0157
Slope	0.0245
Correlation Coeff. (R)	0.979

Symbols used in IFU and Packaging	
IVD In vitro diagnostic medical device vitro	Manufacturer
REF Catalogue Number	Instruction for use
LOT Lot Number	Temperature limitation
Expiration date	

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REVISION	DATE	CHANGE
Rev.E	06/2024	New Issue for IVDR Regulation (UE) 2017/746 compliance

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