

## Cystatin C FS\*

### Order Information

Cat. No.	Kit size
1 7158 99 10 921	 400 (4 x 100)
1 7158 99 10 926	 200 (2 x 100)

### Intended Use

Diagnostic reagent for quantitative in vitro determination of cystatin C in human serum or heparin plasma on automated DiaSys respons<sup>®</sup>920.

### Summary

Cystatin C is a non-glycosylated, basic protein with a low molecular weight of 13 kDa. It acts as a cysteine protease inhibitor, is endogenously produced at a constant rate by all nucleated cells investigated and freely filtered by the glomerular membrane before being almost completely reabsorbed and degraded in the renal tubuli. Cystatin C is suggested to be a better marker for detection of reduced glomerular filtration rate (GFR) than creatinine especially for the detection of a moderate impairment of kidney function. The cystatin C blood level is, in contrast to creatinine, is less dependent on factors such as sex, muscle mass and age. Cystatin C determination may be useful especially in children, elder people, in diabetics, in patients with liver cirrhosis, in adult renal transplant recipients, in cancer patients and in pregnant woman suspected of preeclampsia. [1-9]

### Method

Particle enhanced immunoturbidimetric test

Determination of cystatin C concentration by photometric measurement of antigen antibody reaction between antibodies against cystatin C bound to polystyrene particles and cystatin C present in the sample.

### Reagents

#### Components and Concentrations

<b>R1:</b>	TRIS	pH 7.5	100 mmol/L
	NaCl		200 mmol/L
<b>R2:</b>	Borate		7.5 mmol/L
	Monoclonal antibodies (mouse)		< 1%
	against human cystatin C bound to		
	carboxylated polystyrene particles		

### Storage and Stability

Reagents are stable up to the date of expiry indicated on the kit, if stored at 2 – 8°C and contamination is avoided. Protect from light.

### Warnings and Precautions

1. Reagent 1 contains sodium azide (0.9 g/L) as preservative. Do not swallow! Avoid contact with skin and mucous membranes.
2. Reagent 2 contains sodium azide (0.95 g/L) as preservative. Do not swallow! Avoid contact with skin and mucous membranes.
3. The reagents contain animal material. Handle the product as potentially infectious according to universal precautions and good clinical laboratory practices.
4. To avoid carryover interference, please take care of efficient washing especially after use of interfering reagents. Please refer to the DiaSys respons<sup>®</sup>920 Carryover Pair Table. Carryover pairs and automated washing steps with the recommended cleaning solution can be specified in the system software. Please refer to the user manual.
5. In very rare cases, samples of patients with gammopathy might give falsified results [10].
6. Please refer to the safety data sheets and take the necessary precautions for the use of laboratory reagents. For diagnostic purposes, the results should always be assessed with the patient's medical history, clinical examinations and other findings.
7. For professional use only.

### Waste Management

Refer to local legal requirements.

### Reagent Preparation

The reagents are ready to use. The bottles are placed directly into the reagent rotor.

### Materials Required

General laboratory equipment

### Specimen

Human serum or heparin plasma

Stability [11]:

2 days	at	20 – 25°C
1 week	at	2 – 8°C
1 month	at	-20°C

Only freeze once. Discard contaminated specimens.

### Calibrators and Controls

DiaSys TruCal Cystatin C calibrator set is recommended for calibration. Calibrator values have been made traceable to the IFCC reference material ERM<sup>®</sup>-DA471. Use DiaSys TruLab Cystatin C Level 1 and Level 2 for internal quality control. Each laboratory should establish corrective action in case of deviations in control recovery.

	Cat. No.	Kit size
TruCal Cystatin C	1 7150 99 10 059	5 x 1 mL
TruLab Cystatin C Level 1	5 9870 99 10 046	3 x 1 mL
TruLab Cystatin C Level 2	5 9880 99 10 046	3 x 1 mL

### Performance Characteristics

Exemplary data mentioned below may slightly differ in case of deviating measurement conditions.

Measuring range from 0.1 to 8 mg/L, depending on the concentration of the highest calibrator.	
In case of higher concentrations re-measure samples after manual dilution with NaCl solution (9 g/L) or use rerun function.	
Limit of detection**	0.08 mg/L
No prozone effect up to 30 mg/L.	
Onboard stability	12 weeks
Calibration stability	2 weeks

Interfering substance	Interferences ≤ 10% up to
Bilirubin	60 mg/dL
Hemoglobin	1000 mg/dL
Lipemia (triglycerides)	1000 mg/dL
Rheumatoid factor	600 IU/mL

Thyroid dysfunction impacts cystatin C levels [12].  
For further information on interfering substances refer to Young DS [13,14].

Precision			
Within run (n=20)	Sample 1	Sample 2	Sample 3
Mean [mg/L]	0.70	0.95	3.08
CV [%]	2.53	2.26	1.88
Between day (n=20)	Sample 1	Sample 2	Sample 3
Mean [mg/L]	0.91	1.12	3.44
CV [%]	3.71	3.08	3.53

Method comparison (n=100)	
Test x	Competitor Cystatin C (Nephelometer)
Test y	DiaSys Cystatin C FS (respons <sup>®</sup> 920)
Slope	0.959
Intercept	-0.043 mg/L
Coefficient of correlation	0.998

\*\* lowest measurable concentration which can be distinguished from zero; mean + 3 SD (n = 20) of an analyte free specimen.

## Reference Range [15,16,17]

[mg/L]

### Children

4th and 5th day	1.22 – 1.68
< 1 month	1.37 – 1.89
1 – 12 months	0.73 – 1.17
> 12 months	0.60 – 0.84

Mean values +/- 1 SD (standard deviation) are listed

### Adults

19 – 49 years	0.53 – 0.92
≥ 50 years	0.58 – 1.02

Indication of 2 SD range

Each laboratory should check if the reference ranges are transferable to its own patient population and determine own reference ranges if necessary.

## Literature

1. Erland J.E., Randers E., Kristensen J.H. Reference intervals for serum cystatin C and serum creatinine in adults. *Clin Chem Lab Med* 1998; 36(6):393-397.
2. Lamb E., Newman DJ, Price CP Kidney function tests. In: Burtis CA, Ashwood ER, Bruns DE, editors. *Tietz Textbook of Clinical Chemistry and Molecular Diagnostics*. 4th edition St. Louis Missouri: Elsevier Saunders; 2006; p. 823-835.
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16. Randers E, Krue S, Erlandsen EJ, Danielsen H, Hansen H, Hansen LG. Reference interval for serum cystatin C in children. *ClinChem* 1999; 45:1856-60.
17. Finney H, Newman DJ, Price CP. Adult reference ranges for serum cystatin C, creatinine and predicted creatinine clearance. *Ann Clin Biochem* 2000; 37: 49-59.



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\* Fluid Stable

## Cystatin C FS

### Application for Serum and Plasma

Test Details	Test Volumes	Reference Ranges
Test : <input type="text" value="CYSC"/>		Auto Rerun : <input type="checkbox"/>
Report Name : <input type="text" value="Cystatin C"/>		Total Reagents : <input type="text" value="2"/>
Unit : <input type="text" value="mg/L"/>	Decimal Places : <input type="text" value="2"/>	Reagent R1 : <input type="text" value="CYSC R1"/>
Wavelength-Primary : <input type="text" value="505"/>	Secondary : <input type="text" value="0"/>	Reagent R2 : <input type="text" value="CYSC R2"/>
Assay Type : <input type="text" value="2-Point"/>	Curve Type : <input type="text" value="Cubic Spline"/>	
M1 Start : <input type="text" value="19"/>	M1 End : <input type="text" value="19"/>	Consumables/Calibrators:
M2 Start : <input type="text" value="31"/>	M2 End : <input type="text" value="31"/>	Blank/Level 0 : <input type="text" value="0"/>
Sample Replicates : <input type="text" value="1"/>	Standard Replicates : <input type="text" value="3"/>	Calibrator Level 1 : <input type="text" value="**"/>
Control Replicates : <input type="text" value="1"/>	Control Interval : <input type="text" value="0"/>	Calibrator Level 2 : <input type="text" value="**"/>
Reaction Direction : <input type="text" value="Increasing"/>	React. Abs. Limit : <input type="text" value="*"/>	Calibrator Level 3 : <input type="text" value="**"/>
Prozone Limit % : <input type="text" value="97"/>	Prozone Check : <input type="text" value="Lower"/>	Calibrator Level 4 : <input type="text" value="**"/>
Linearity Limit % : <input type="text" value="0"/>	Delta Abs. / Min. : <input type="text" value="0.00"/>	Calibrator Level 5 : <input type="text" value="**"/>
Technical Minimum : <input type="text" value="*"/>	Technical Maximum : <input type="text" value="*"/>	
Y = aX + b    a = <input type="text" value="1.00"/>	b = <input type="text" value="0.00"/>	

\* Technical limits are automatically defined by the software via the upper and lower calibrator level.

\*\* Enter calibrator value.

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