IGG-2

cobas®

Tina-quant IgG Gen.2

Order information

REF	CONTENT		Analyzer(s) on which **cobas c** pack(s) can be used
03507432 190	Tina-quant IgG Gen.2 150 tests	System-ID 07 6787 5	**cobas c** 311, **cobas c** 501/502
11355279 216	Calibrator f.a.s. Proteins (5 × 1 mL)	Code 656	
03121305 122	Calibrator f.a.s. PUC (5 × 1 mL)	Code 489	
10557897 122	Precinorm Protein (3 x 1 mL)	Code 302	
11333127 122	Precipath Protein (3 × 1 mL)	Code 303	
03121313 122	Precinorm PUC (4 × 3 mL)	Code 240	
03121291 122	Precipath PUC (4 × 3 mL)	Code 241	
05117003 190	PreciControl ClinChem Multi 1 (20 x 5 mL)	Code 391	
05947626 190	PreciControl ClinChem Multi 1 (4 x 5 mL)	Code 391	
05117216 190	PreciControl ClinChem Multi 2 (20 x 5 mL)	Code 392	
05947774 190	PreciControl ClinChem Multi 2 (4 x 5 mL)	Code 392	
04489357 190	Diluent NaCl 9 % (50 mL)	System-ID 07 6869 3	

English

System information

For **cobas c** 311/501 analyzers:

IGG-2: ACN 674 (Standard application for serum and plasma)

IGGC2: ACN 673 (Sensitive application for cerebrospinal fluid)

IGGU2: ACN 625 (Sensitive application for urine)

For **cobas c** 502 analyzer:

IGG-2: ACN 8674 (Standard application for serum and plasma)

IGGC2: ACN 8673 (Sensitive application for cerebrospinal fluid)

IGGU2: ACN 8625 (Sensitive application for urine)

Intended use

In vitro test for the quantitative determination of IgG in human serum, plasma, cerebrospinal fluid and urine on Roche/Hitachi **cobas c** systems.

Summary[1,2,3,4,5,6,7,8,9]

IgG molecules are composed of two light chains (kappa or lambda) and two gamma heavy chains. Approximately 80 % of serum immunoglobulin is IgG; its main tasks are the defense against microorganisms, direct neutralization of toxins and induction of complement fixation. IgG is the only immunoglobulin that can cross the placental barrier and provide passive immune protection for the fetus and newborn. This maternal protection gradually declines until the infant's own immunological system starts to develop (at about six months of age). Near-adult levels in serum/plasma are reached at 18 months.

Polyclonal IgG increases in serum/plasma may be present in systemic lupus erythematosis, chronic liver diseases (infectious hepatitis and Laennec's cirrhosis), infectious diseases and cystic fibrosis. Monoclonal IgG increases in IgG-myeloma.

Decreased synthesis of IgG is found in congenital and acquired immunodeficiency diseases and selective IgG subclass deficiencies, such as Bruton type agammaglobulinemia. Decreased IgG concentrations in serum and plasma are seen in protein-losing enteropathies, nephrotic syndrome and through the skin from burns. Increased IgG metabolism is found in Wiskott-Aldrich syndrome, myotonic dystrophy and with anti-immunoglobulin antibodies.

The determination of IgG in cerebrospinal fluid (CSF) is used for evaluation of infections involving the central nervous system (CNS), neoplasms or primary neurologic diseases (in particular, multiple sclerosis). Increased CSF IgG concentrations may occur because of either increased permeability of the blood-brain barrier or local/intrathecal production of IgG, or both.

Malfunction of the blood-brain barrier can be reliably quantified by means of the albumin CSF/serum ratio. An elevated albumin ratio is an indication of a disorder of the blood-brain barrier. If IgG and albumin are measured in CSF and serum simultaneously, differentiation between IgG originating from blood and IgG originating from intrathecal production is possible.

The determination of urine IgG aids, in combination with urinary albumin, to separate selective forms from unselective forms of tubular proteinuria, since IgG is markedly increased only in unselective forms of glomerular proteinuria (IgG/albumin > 0.03 mg/mg). Additionally, measurements of IgG in urine can be used in the monitoring and assessment of glomerular proreinuria.

The Roche IgG assay is based on the principle of immunological agglutination. In addition to the standard application (IGG-2), there are sensitive applications (IGGC2 and IGGU2) designed for the quantitative determination of IgG in CSF and urine.

It is known that the so-called paraproteins secreted in monoclonal gammopathies (monoclonal immunoglobulinemia) may differ from the respective immunoglobulins of polyclonal origin by amino acid composition and size. This may impair the binding to antibody and hence impair accurate quantitation.

Test principle

Immunoturbidimetric assay.

Anti-IgG antibodies react with antigen in the sample to form an antigen/antibody complex. Following agglutination, this is measured turbidimetrically. Addition of PEG allows the reaction to progress rapidly to the end point, increases sensitivity, and reduces the risk of samples containing excess antigen producing false negative results.

Reagents - working solutions

R1	TRIS buffer: 20 mmol/L, pH 8.0; NaCl: 200 mmol/L; polyethylene glycol: 3.6 %; preservative; stabilizers
R2	Anti-human IgG antibody (goat): dependent on titer; TRIS buffer: 20 mmol/L, pH 8.0; NaCl: 150 mmol/L; preservative

R1 is in position B and R2 is in position C.

Precautions and warnings

For in vitro diagnostic use.
Exercise the normal precautions required for handling all laboratory reagents.
Disposal of all waste material should be in accordance with local guidelines.
Safety data sheet available for professional user on request.

This kit contains components classified as follows in accordance with the Regulation (EC) No. 1272/2008:

Danger

H318	Causes serious eye damage.

Prevention:

P280	Wear eye protection/ face protection.

Response:

P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.

Product safety labeling follows EU GHS guidance.

Contact phone: all countries: +49-621-7590

Reagent handling

Ready for use

Storage and stability

IGG-2

Shelf life at 2-8 °C:	See expiration date on **cobas c** pack label.
On-board in use and refrigerated on the analyzer:	12 weeks

Diluent NaCl 9 %

Shelf life at 2-8 °C:	See expiration date on **cobas c** pack label.
On-board in use and refrigerated on the analyzer:	12 weeks

Specimen collection and preparation

For specimen collection and preparation only use suitable tubes or collection containers.

Only the specimens listed below were tested and found acceptable.

Serum/plasma application (IGG-2)

Serum.

Plasma: Li-heparin and K_2-EDTA plasma

CSF application (IGGC2)

Cerebrospinal fluid.

The sample types listed were tested with a selection of sample collection tubes that were commercially available at the time of testing, i.e. not all available tubes of all manufacturers were tested. Sample collection systems from various manufacturers may contain differing materials which could affect the test results in some cases. When processing samples in primary tubes (sample collection systems), follow the instructions of the tube manufacturer.

Urine application (IGGU2)

Urine.

Centrifuge samples containing precipitates before performing the assay.

See the limitations and interferences section for details about possible sample interferences.

Serum and plasma

Stability:[10]	4 months at 15-25 °C
	8 months at 2-8 °C
	8 months at (-15)-(-25) °C

CSF

Samples should be as fresh as possible. Centrifuge samples containing particles and/or cells before performing the assay.

Stability:[10]	1 day at 15-25 °C
	7 days at 2-8 °C
	Storage at (-15)-(-25) °C is not recommended.

Urine

Spontaneous, 24-hour urine or 2nd morning urine. Centrifuge the urine samples for 10 min at ≥ 800 g.

Stability:[11]	7 days at 15-25 °C
	1 month at 2-8 °C
	Storage at (-15)-(-25) °C is not recommended.

Materials provided

See "Reagents – working solutions" section for reagents.

Materials required (but not provided)

- See "Order information" section
- General laboratory equipment

Assay

For optimum performance of the assay follow the directions given in this document for the analyzer concerned. Refer to the appropriate operator's manual for analyzer-specific assay instructions.

The performance of applications not validated by Roche is not warranted and must be defined by the user.

Application for serum and plasma (IGG-2)

cobas c 311 **test definition**

Assay type	2-Point End		
Reaction time / Assay points	10 / 6-16		
Wavelength (sub/main)	700/340 nm		
Reaction direction	Increase		
Units	g/L (µmol/L, mg/dL)		
Reagent pipetting		Diluent (H_2O)	
R1	120 µL	–	
R2	38 µL	–	
Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	5 µL	9 µL	180 µL
Decreased	3.9 µL	2 µL	180 µL
Increased	9.4 µL	20 µL	85 µL

cobas c 501/502 **test definition**

Assay type	2-Point End		
Reaction time / Assay points	10 / 10-46		
Wavelength (sub/main)	700/340 nm		
Reaction direction	Increase		
Units	g/L (µmol/L, mg/dL)		
Reagent pipetting		Diluent (H_2O)	
R1	120 µL	–	
R2	38 µL	–	
Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	5 µL	9 µL	180 µL
Decreased	3.9 µL	2 µL	180 µL
Increased	9.4 µL	20 µL	85 µL

Application for CSF (IGGC2)

cobas c 311 **test definition**

Assay type	2-Point End
Reaction time / Assay points	10 / 6-31
Wavelength (sub/main)	700/340 nm
Reaction direction	Increase
Units	mg/L (nmol/L)

IGG-2

Tina-quant IgG Gen.2

Reagent pipetting		Diluent (H_2O)	
R1	120 µL	–	
R2	10 µL	20 µL	
Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	14.5 µL	–	–
Decreased	2.9 µL	–	–
Increased	14.5 µL	–	–

cobas c 501 **test definition**

Assay type	2-Point End		
Reaction time / Assay points	10 / 10-46		
Wavelength (sub/main)	700/340 nm		
Reaction direction	Increase		
Units	mg/L (nmol/L)		
Reagent pipetting		Diluent (H_2O)	
R1	120 µL	–	
R2	10 µL	20 µL	
Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	14.5 µL	–	–
Decreased	2.9 µL	–	–
Increased	14.5 µL	–	–

cobas c 502 **test definition**

Assay type	2-Point End		
Reaction time / Assay points	10 / 10-46		
Wavelength (sub/main)	700/340 nm		
Reaction direction	Increase		
Units	mg/L (nmol/L)		
Reagent pipetting		Diluent (H_2O)	
R1	120 µL	–	
R2	10 µL	20 µL	
Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	14.5 µL	–	–
Decreased	2.9 µL	–	–
Increased	29 µL	–	–

Application for urine (IGGU2)

cobas c 311 **test definition**

Assay type	2-Point End		
Reaction time / Assay points	10 / 6-31		
Wavelength (sub/main)	700/340 nm		
Reaction direction	Increase		
Units	mg/L (nmol/L)		
Reagent pipetting		Diluent (H_2O)	
R1	120 µL	–	
R2	38 µL	–	
Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	14.5 µL	–	–
Decreased	14.5 µL	15 µL	135 µL
Increased	14.5 µL	–	–

cobas c 501 **test definition**

Assay type	2-Point End		
Reaction time / Assay points	10 / 10-46		
Wavelength (sub/main)	700/340 nm		
Reaction direction	Increase		
Units	mg/L (nmol/L)		
Reagent pipetting		Diluent (H_2O)	
R1	120 µL	–	
R2	38 µL	–	
Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	14.5 µL	–	–
Decreased	14.5 µL	15 µL	135 µL
Increased	14.5 µL	–	–

cobas c 502 **test definition**

Assay type	2-Point End		
Reaction time / Assay points	10 / 10-46		
Wavelength (sub/main)	700/340 nm		
Reaction direction	Increase		
Units	mg/L (nmol/L)		
Reagent pipetting		Diluent (H_2O)	
R1	120 µL	–	
R2	38 µL	–	
Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	14.5 µL	–	–
Decreased	14.5 µL	15 µL	135 µL
Increased	29 µL	–	–

Calibration

Serum/plasma application (IGG-2) :

Calibrators	S1: H_2O	
	S2-S6: C.f.a.s. Proteins	
	Multiply the lot-specific C.f.a.s. Proteins calibrator value by the factors below to determine the standard concentrations for the 6-point calibration curve:	
	S2: 0.100	S5: 1.00
	S3: 0.250	S6: 3.14
	S4: 0.501	
Calibration mode	**cobas c** 311 analyzer: Spline	
	cobas c 501/502 analyzer: RCM	
Calibration frequency	Full calibration	
	- after reagent lot change	
	- as required following quality control procedures	

CSF (IGGC2) and urine (IGGU2) applications:

Calibrators	S1: H_2O	
	S2-S6: C.f.a.s. PUC	
	Multiply the lot-specific C.f.a.s. PUC calibrator value by the factors below to determine the standard concentrations for the 6-point calibration curve:	
	S2: 0.0431	S5: 0.331
	S3: 0.0862	S6: 1.00
	S4: 0.166	
Calibration mode	RCM	
Calibration frequency	Full calibration	
	- after reagent lot change	
	- as required following quality control procedures	

Calibration interval may be extended based on acceptable verification of calibration by the laboratory.

Traceability: This method has been standardized against the certified reference material in human serum of the IRMM (Institute for Reference Materials and Measurements) ERM-DA470k/IFCC.

Quality control

For quality control, use control materials as listed in the "Order information" section.

IGG-2: Precinorm Protein, Precipath Protein, Precinorm U, PreciControl ClinChem Multi 1, PreciControl ClinChem Multi 2

IGGC2 and IGGU2: Precinorm PUC, Precipath PUC

In addition, other suitable control material can be used.

The control intervals and limits should be adapted to each laboratory's individual requirements. Values obtained should fall within the defined limits. Each laboratory should establish corrective measures to be taken if values fall outside the defined limits.

Follow the applicable government regulations and local guidelines for quality control.

Calculation

Roche/Hitachi **cobas c** systems automatically calculate the analyte concentration of each sample.

Conversion factors:	mg/dL x 0.01 = g/L	g/L x 6.67 = µmol/L
	g/L x 100 = mg/dL	µmol/L x 0.15 = g/L
	mg/L x 6.67 = nmol/L	nmol/L x 0.15 = mg/L

Limitations - interference

Serum/plasma application (IGG-2):

Criterion: Recovery within ± 10 % of initial value at an IgG concentration of 7.00 g/L (46.7 µmol/L, 700 mg/dL).

Icterus:[12] No significant interference up to an I index of 60 for conjugated and unconjugated bilirubin (approximate conjugated and unconjugated bilirubin concentration: 1026 µmol/L or 60 mg/dL).

Hemolysis:[12] No significant interference up to an H index of 1000 (approximate hemoglobin concentration: 621 µmol/L or 1000 mg/dL).

Lipemia (Intralipid):[12] No significant interference up to an L index of 2000 (approximate intralipid concentration: 2000 mg/dL). There is poor correlation between the L index (corresponds to turbidity) and triglycerides concentration.

Rheumatoid factors: No significant interference from rheumatoid factors up to a concentration of 1200 IU/mL.

High dose hook-effect: No false result up to an IgG concentration of 400 g/L (2668 µmol/L, 40000 mg/dL) occurs due to an antigen excess within polyclonal specimens.

There is no cross-reaction between IgG and IgA or IgM under the assay conditions.

Drugs: No interference was found at therapeutic concentrations using common drug panels.[13,14]

As with other turbidimetric or nephelometric procedures, this test may not provide accurate results in patients with monoclonal gammopathy, due to individual sample characteristics which can be assessed by electrophoresis.[15]

CSF application (IGGC2):

Criterion: Recovery within ± 10 % of initial value at an IgG concentration of 15.00 mg/L (100 nmol/L).

Icterus: No significant interference up to a conjugated and unconjugated bilirubin concentration of 257 µmol/L or 15 mg/dL.

Hemolysis: No significant interference up to a hemoglobin concentration of 124 µmol/L or 200 mg/dL.

High dose hook-effect: Using the prozone check, no false result without a flag was observed up to an IgG concentration of 2500 mg/L (16675 nmol/L).

There is no cross-reaction between IgG and IgA or IgM under the assay conditions.

Urine application (IGGU2):

Criterion: Recovery within ± 2 mg/L (± 13.3 nmol/L) of initial value at an IgG concentration of ≤ 10 mg/L (≤ 66.7 nmol/L) and within ± 10 % of initial value at an IgG concentration of > 10 mg/L (> 66.7 nmol/L).

Icterus: No significant interference up to a conjugated and unconjugated bilirubin concentration of 257 µmol/L or 15 mg/dL.

Hemolysis: No significant interference up to a hemoglobin concentration of 93.2 µmol/L or 150 mg/dL.

High dose hook-effect: No false result occurs up to an IgG concentration of 6000 mg/L (40020 nmol/L).

Drugs: No interference was found at therapeutic concentrations using common drug panels.[14]

Exception: N-acetyl cysteine and ascorbic acid cause artificially low IgG results.

No interference by h-albumin ≤ 5000 mg/L, glucose ≤ 111 mmol/L, creatinine ≤ 44 mmol/L, urea ≤ 900 mmol/L, uric acid ≤ 6 mmol/L, oxalate ≤ 2.2 mmol/L, calcium ≤ 40 mmol/L, citrate ≤ 10 mmol/L, magnesium ≤ 75 mmol/L and phosphate ≤ 40 mmol/L.

For diagnostic purposes, the results should always be assessed in conjunction with the patient's medical history, clinical examination and other findings.

ACTION REQUIRED

Special Wash Programming: The use of special wash steps is mandatory when certain test combinations are run together on Roche/Hitachi **cobas c** systems. The latest version of the carry-over evasion list can be found with the NaOHD-SMS-SmpCln1+2-SCCS Method Sheets. For further instructions refer to the operator's manual. **cobas c** 502 analyzer: All special wash programming necessary for avoiding carry-over is available via the **cobas** link, manual input is required in certain cases.

Where required, special wash/carry-over evasion programming must be implemented prior to reporting results with this test.

Limits and ranges

Measuring range

Serum/plasma application (IGG-2):

3.00-50.0 g/L (20.0-334 µmol/L, 300-5000 mg/dL)

Determine samples having higher concentrations via the rerun function. Dilution of samples via the rerun function is a 1:5.5 dilution. Results from samples diluted using the rerun function are automatically multiplied by a factor of 5.5.

Determine samples having lower concentrations via the rerun function. For samples with lower concentrations, the re-run function increases the sample volume by a factor of 7.5. The results are automatically divided by this factor.

CSF application (IGGC2):

4.00-200 mg/L (26.7-1334 nmol/L)

Determine samples having higher concentrations via the rerun function. Dilution of samples via the rerun function is a 1:5 dilution. Results from samples diluted using the rerun function are automatically multiplied by a factor of 5.

Urine application (IGGU2):

4.00-200 mg/L (26.7-1334 nmol/L)

Determine samples having higher concentrations via the rerun function. Dilution of samples via the rerun function is a 1:10 dilution. Results from samples diluted using the rerun function are automatically multiplied by a factor of 10.

Lower limits of measurement

Lower detection limit of the test

Serum/plasma application (IGG-2):

0.30 g/L (2.00 µmol/L, 30 mg/dL)

The lower detection limit represents the lowest measurable analyte level that can be distinguished from zero. It is calculated as the value lying 3 standard deviations above that of the lowest standard (standard 1 + 3 SD, repeatability, n = 21).

CSF application (IGGC2):

4.00 mg/L (26.7 nmol/L).

The lower detection limit represents the lowest measurable analyte level that can be distinguished from zero. It is calculated as the value lying 3 standard deviations above that of the lowest standard (standard 1 + 3 SD, repeatability, n = 21).

Urine application (IGGU2):

Limit of Blank, Limit of Detection and Limit of Quantitation

Limit of Blank	= 3 mg/L (20.0 nmol/L)
Limit of Detection	= 4 mg/L (26.7 nmol/L)
Limit of Quantitation	= 7 mg/L (46.7 nmol/L)

The Limit of Blank and Limit of Detection were determined in accordance with the CLSI (Clinical and Laboratory Standards Institute) EP17-A requirements.

The Limit of Blank is the 95th percentile value from n ≥ 60 measurements of analyte-free samples over several independent series. The Limit of Blank corresponds to the concentration below which analyte-free samples are found with a probability of 95 %.

The Limit of Detection is determined based on the Limit of Blank and the standard deviation of low concentration samples.

The Limit of Detection corresponds to the lowest analyte concentration which can be detected (value above the Limit of Blank with a probability of 95 %).

The Limit of Quantitation is the lowest analyte concentration that can be reproducibly measured with a total error of 30 %. It has been determined using low concentration IgG samples.

Expected values

Serum/plasma

Adults[16]	7-16 g/L	46.7-107 µmol/L	700-1600 mg/dL

CSF[17]

10-30 mg/L (66.7-200 nmol/L)

Urine

The upper normal 97.5th percentile limit was found to be 8.5 mg/24 h for IgG (0.90 confidence interval: 7.7-10.1 mg/24 h).[18]

Each laboratory should investigate the transferability of the expected values to its own patient population and if necessary determine its own reference ranges.

Specific performance data

Representative performance data on the analyzers are given below. Results obtained in individual laboratories may differ.

Precision

Serum/plasma and *CSF:*

Precision was determined using human samples and controls in an internal protocol with repeatability (n = 21) and intermediate precision (3 aliquots per run, 1 run per day, one lot of reagent, 21 days).

Urine:

Precision was determined using human samples and controls in accordance with the CLSI (Clinical and Laboratory Standards Institute) EP5 requirements with repeatability (n = 84) and intermediate precision (4 aliquots per run, 1 run per day, 21 days on Roche/Hitachi **cobas c** 501 analyzer). The following results were obtained:

Serum/plasma application (IGG-2):

Repeatability	*Mean*	*SD*	*CV*
	g/L (µmol/L, mg/dL)	*g/L (µmol/L, mg/dL)*	*%*
Precinorm Protein	8.25 (55.0, 825)	0.08 (0.5, 8)	1.0
Precipath Protein	14.2 (94.7, 1420)	0.2 (1.3, 20)	1.2
Human serum 1	8.44 (56.3, 844)	0.05 (0.3, 5)	0.6
Human serum 2	21.5 (143, 2150)	0.3 (2, 30)	1.5
Intermediate precision	*Mean*	*SD*	*CV*
	g/L (µmol/L, mg/dL)	*g/L (µmol/L, mg/dL)*	*%*
Precinorm Protein	8.19 (54.6, 819)	0.12 (0.8, 12)	1.5
Precipath Protein	14.2 (94.7, 1420)	0.2 (1.3, 20)	1.5
Human serum 3	7.11 (47.4, 711)	0.08 (0.5, 8)	1.1
Human serum 4	21.1 (140, 2110)	0.4 (3, 40)	1.7

CSF application (IGGC2):

Repeatability	*Mean*	*SD*	*CV*
	mg/L (nmol/L)	*mg/L (nmol/L)*	*%*
Precinorm PUC	18.8 (125)	0.3 (2)	1.6
Precipath PUC	150 (1001)	2 (13)	1.1
CSF 1	7.62 (50.7)	0.25 (1.7)	3.3
CSF 2	95.0 (634)	0.5 (3)	0.5
Intermediate precision	*Mean*	*SD*	*CV*
	mg/L (nmol/L)	*mg/L (nmol/L)*	*%*
Precinorm PUC	20.1 (134)	0.5 (3)	2.5
Precipath PUC	160 (1067)	2 (13)	1.0
CSF 3	21.9 (146)	0.5 (3)	2.1
CSF 4	137 (914)	1 (7)	1.1

Urine application (IGGU2):

Repeatability	*Mean*	*SD*	*CV*
	mg/L (nmol/L)	*mg/L (nmol/L)*	*%*
Precinorm PUC	17.2 (115)	0.3 (2)	1.5
Precipath PUC	140 (934)	1 (7)	0.9
Urine 1	7.52 (50.2)	0.28 (1.9)	3.7
Urine 2	89.9 (600)	0.6 (4)	0.7
Urine 3	160 (1067)	1 (7)	0.7
Intermediate precision	*Mean*	*SD*	*CV*
	mg/L (nmol/L)	*mg/L (nmol/L)*	*%*
Precinorm PUC	17.2 (115)	0.4 (3)	2.5
Precipath PUC	140 (934)	1 (7)	0.9
Urine 1	7.52 (50.2)	0.36 (2.4)	4.8
Urine 2	89.9 (600)	0.9 (6)	1.0
Urine 3	160 (1067)	2 (13)	1.0

Method comparison

Serum/plasma application (IGG-2):

IgG values for human serum and plasma samples obtained on a Roche/Hitachi **cobas c** 501 analyzer (y) were compared with those determined using the corresponding reagent on a Roche/Hitachi 917 analyzer (x).

Sample size (n) = 103

Passing/Bablok[19]	Linear regression
y = 0.981x + 0.256 g/L	y = 0.990x + 0.229 g/L
τ = 0.957	r = 0.995

The sample concentrations were between 3.16 and 48.2 g/L (21.1 and 321 µmol/L, 316 and 4820 mg/dL).

CSF application (IGGC2):

IgG values for human CSF samples obtained on a Roche/Hitachi **cobas c** 501 analyzer (y) were compared with those determined using the corresponding reagent on a Roche/Hitachi 917 analyzer (x).

Sample size (n) = 77

Passing/Bablok[19]	Linear regression
y = 1.007x - 2.17 mg/L	y = 0.997x - 1.70 mg/L
τ = 0.941	r = 1.000

The sample concentrations were between 10.7 and 186 mg/L (71.4 and 1241 nmol/L).

Urine application (IGGU2):

IgG values for human urine samples obtained on a Roche/Hitachi **cobas c** 501 analyzer (y) were compared with those determined with a nephelometric IgG test (x).

Sample size (n) = 64

Passing/Bablok[19]	Linear regression
y = 0.957x + 1.03 mg/L	y = 0.948x + 1.43 mg/L
τ = 0.877	r = 0.982

The sample concentrations were between 3.75 and 57.9 mg/L (25.0 and 386 nmol/L).

References

1 Kaplan LA, Pesce AJ, Kazmierczak AC, eds. Clinical Chemistry, Theory, Analysis and Correlation, 4th edition. Mosby Inc 2003.

2 Henry JB. Clinical Diagnosis and Management by Laboratory Methods, 21st edition. Philadelphia: WB Saunders 2006.

3 Tietz NW, ed. Clinical Guide to Laboratory Tests, 4th ed. Philadelphia. WB Saunders Co 2006;604-606.

4 Hofmann W, Schmidt D, Guder WG, et al. Differentiation of hematuria by quantitative determination of urinary marker proteins. Klin Wochenschr 1991;69:68-75.

5 Guder WG, Hofman W. Differentiation of proteinuria and haematuria by single protein analysis in urine. Clin Biochem 1993;26:277-82.

6 Tietz NW. Fundamentals of Clinical Chemistry, 6th ed. Saunders Elsevier 2008.

7 Reiber H. Flow rate of cerebrospinal fluid (CSF) – a concept common to normal blood-CSF barrier function and to dysfunction in neurological diseases. J Neurol Sci 1994;122:189-203.

8 Reiber H. Clinical Relevance of Neuroimmunological Reaction Patterns in Cerebrospinal Fluid. Lab Med. 1995;19:444-462.

9 Reiber H. External Quality Assessment in Clinical Neurochemistry: Survey of Analysis for Cerebrospinal Fluid (CSF) Proteins based on CSF/Serum Quotients. Clin Chem 1995;41(2):256-263.

10 Use of Anticoagulants in Diagnostic Laboratory Investigations. WHO Publication WHO/DIL/LAB/99.1 Rev. 2: Jan 2002.

11 Quality of Diagnostic Samples, Recommendations of the Working Group on Preanalytical Quality of the German Society for Clinical Chemistry and Laboratory Medicine, 3rd completely revised ed. 2010.

12 Glick MR, Ryder KW, Jackson SA. Graphical Comparisons of Interferences in Clinical Chemistry Instrumentation. Clin Chem 1986;32:470-475.

13 Breuer J. Report on the Symposium "Drug effects in Clinical Chemistry Methods". Eur J Clin Chem Clin Biochem 1996;34:385-386.

14 Sonntag O, Scholer A. Drug interference in clinical chemistry: recommendation of drugs and their concentrations to be used in drug interference studies. Ann Clin Biochem 2001;38:376-385.

15 Attaelmannan M, Levinson SS. Understanding and identifying monoclonal gammopathies. Clin Chem 2000;46(8 Pt 2):1230-1238.

16 Dati F, Schumann G, Thomas L, et al. Consensus of a group of professional societies and diagnostic companies on guidelines for interim reference ranges for 14 proteins in serum based on the standardization against the IFCC/BCR/CAP reference material (CRM 470). Eur J Clin Chem Clin Biochem 1996;34:517-520.

17 Reiber H, Thompson EJ, Grimsley G, et al. Quality Assurance for Cerebrospinal Fluid Protein Analysis: International Consensus by an Internet-based Group Discussion. Clin Chem Lab Med 2003;41:331-337.

18 Bergón E, Granados R, Fernández-Segoviano P, et al. Classification of Renal Proteinuria: A simple Algorithm. Clin Chem Lab Med 2002;40:1143-50.

19 Bablok W, Passing H, Bender R, et al. A general regression procedure for method transformation. Application of linear regression procedures for method comparison studies in clinical chemistry, Part III. J Clin Chem Clin Biochem 1988 Nov;26(11):783-790.

A point (period/stop) is always used in this Method Sheet as the decimal separator to mark the border between the integral and the fractional parts of a decimal numeral. Separators for thousands are not used.

Symbols

Roche Diagnostics uses the following symbols and signs in addition to those listed in the ISO 15223-1 standard (for USA: see https://usdiagnostics.roche.com for definition of symbols used):

CONTENT	Contents of kit
→	Volume after reconstitution or mixing
GTIN	Global Trade Item Number

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