SCC

cobas®

REF	Σ	SYSTEM
07126972 190	100	MODULAR ANALYTICS E170 **cobas e** 411 **cobas e** 601 **cobas e** 602

English

System information

For **cobas e** 411 analyzer: test number 1390
For MODULAR ANALYTICS E170, **cobas e** 601 and **cobas e** 602 analyzers: Application Code Number 164

Please note

The measured value of squamous cell carcinoma antigen (SCCA) in a given sample, determined with assays from different manufacturers, can vary due to differences in assay methods and reagent specificity. Values determined on samples by different assay methods cannot be used interchangeably.[1] Prior to changing assay methods, the laboratory must confirm baseline values for patients being serially monitored. Therefore laboratory findings must always contain a statement on the squamous cell carcinoma (SCC) assay method used. SCC reactive determinants are shed naturally in skin particles, saliva and other body fluids and can easily be distributed in dust or aerosols, e.g. as a result of sneezing.[2] Contamination of samples or disposables and the instrument with SCCA may cause falsely elevated SCC assay values.

Before starting SCC measurements, the disposable pipette tips and cups on the instrument must be replaced by material that has been freshly unpacked. Contamination of the instrument and environment should be avoided by using cleaning procedures as described in the operator's manual. It is recommended to interpret a positive result in conjunction with the clinical history of the patient and to confirm it by a repeated measurement with fresh sample material. Gloves should be used throughout the test procedure when handling reagents, samples etc. A face mask is also recommended.

Intended use

Immunoassay for the in vitro quantitative determination of squamous cell carcinoma (SCC) antigen in human serum and plasma. The assay is used as an aid in the management of patients with squamous cell carcinoma. The results must be interpreted in conjunction with other methods in accordance with standard clinical management guidelines.

The **e**lectro**c**hemi**l**uminescence **i**mmuno**a**ssay "ECLIA" is intended for use on Elecsys and **cobas e** immunoassay analyzers.

Summary

SCC is a malignant tumor of squamous epithelium. Squamous epithelial cells are the main part of the epidermis, but are also present in the lining of the digestive tract, lungs, and other areas of the body. SCC occurs as a form of cancer in diverse tissues, mainly the lung, uterine cervix, vagina as well as lips, mouth and esophagus. Despite having the same name, squamous cell carcinoma, the SCCs of different locations show tremendous differences in their presenting symptoms, prognosis and response to treatment. Squamous cell carcinoma antigen (SCCA) is a subfraction of TA-4, a tumor antigen first described by Kato and Torigoe in 1977.[3] TA-4, obtained from squamous cell carcinoma tissue of the uterine cervix, has been characterized as a glycoprotein with a molecular weight of 48 kDa and consists of at least 14 subfractions. SCCA being one of those subfractions, is a glycoprotein with a molecular weight of 42 kDa[4] which can be detected by immunohistochemistry in the squamous tissue of the lung, vulva, exocervix, esophagus and skin.[5] The respective gene for SCCA encodes two antigens, the neutral SCCA1 and the acidic SCCA2 which can be detected in serum.[6,7] The biological function of SCCA is that of an enzyme inhibitor, where SCCA1 is an inhibitor of papain-like cysteine proteases (cathepsins L, S and K) and SCCA2 inhibits chymotrypsin-like serine proteases, cathepsin G and chymase.[7,8,9]

Studies with SCCA1 and SCCA2 have shown that for optimal clinical sensitivity, a second generation assay recognizing all serological forms is preferred.[10,11] It was also shown that SCCA1 and SCCA2 are coexpressed in squamous epithelium of tongue, tonsils, esophagus, uterine cervix and vagina.[5] Also in SCC of the lung, head & neck, SCCA1 and SCCA2 are coexpressed in moderately and well-differentiated tumors.[5] The Elecsys SCC assay measures the total amount of SCCA (SCCA1 and SCCA2) in human serum and plasma in an equimolar manner.

General clinical relevance of SCCA:
SCCA has been studied in squamous cell malignancies including lung, uterine cervix, esophagus, head & neck, anal canal and skin.[12,13,14] The more advanced cancer stages are associated with higher SCCA levels especially in lung- and cervical cancer and it was reported that measurement of the antigen, in serial determinations, aids in the assessment of disease recurrence, residual disease following treatment, and response to therapy.[15,16]

Alcohol consumption, tobacco smoking, age and an infection with human papilloma virus (HPV), especially HPV-16 have been found to be associated with SCC of the head & neck,[17] lung,[18] and anogenital region.[19] SCCA can be found in normal squamous epithelia as well as in low concentrations in the blood of every human. It is not a tumor-specific protein.[20] Hence, an elevated level of SCCA can be associated with squamous cell cancers as well as benign disorders.[21] In studies on patients with benign disorders, abnormal SCCA levels were found in patients with chronic renal disease, in haemodialysis patients and in patients with dermatological disorders, such as psoriasis and eczema.[22] Renal failure and dermatological disorders are the most important sources of false positive results with this biomarker.[23]

SCCA in lung cancer:
SCCA has been reported as a biomarker for non-small cell lung cancer (NSCLC), mainly of the squamous cell carcinoma type. SCC in lung is closely correlated with a history of tobacco smoking, more than other types of lung cancer.[24] Based on literature, elevated SCCA serum levels were found to be indicative of NSCLC if renal failure and dermatological diseases were excluded.[25]
Utility of SCCA in lung cancer has also been reported as it indicates disease recurrence and residual disease following treatment and response to therapy.[26,27]

SCCA in cervical cancer:
The most common histology in cervical cancer is SCC, with SCCA being the biomarker of choice for this histology. Serum levels of SCCA have been found to correlate with tumor stage, tumor size, residual tumor after treatment, recurrent or progressive disease, and survival in patients with squamous cell cervical cancer.[28,29]
SCCA has been recognized as the marker of choice for the follow-up of cervical cancer according to the European Group of Tumor Markers guidelines.[30] Especially the value in predicting prognosis, monitoring[31] and pretreatment identification of patients at high risk for lymph node metastases in squamous cell cervical cancer has been described in literature.[32]

It also has been shown that measuring SCCA in combination with hsCRP resulted in the highest detection rate of disease recurrence during cervical cancer follow-up.[33]

SCCA in head & neck cancer:
Head & neck cancer refers to a group of biologically similar cancers that can occur for example in the lip, oral and nasal cavity, pharynx, and larynx. 90 % of head & neck cancers are SCCs, originating from the mucosal lining (epithelium) of these regions. In patients with primary tumors, SCCA serum levels were related to nodal involvement with significantly higher levels in node-positive patients. Multivariate analyses showed that SCCA is a significant independent predictor of disease-free survival and pretreatment levels are an independent prognostic indicator in patients with head and neck malignancies.[34]

Test principle

Sandwich principle. Total duration of assay: 18 minutes.

- 1st incubation: 15 µL of sample and a biotinylated monoclonal SCC-specific antibody are incubated.
- 2nd incubation: After addition of a monoclonal SCC-specific antibody labeled with ruthenium complex[a)] and streptavidin-coated microparticles, the immunocomplex produced becomes bound to the solid phase via interaction of biotin and streptavidin.
- The reaction mixture is aspirated into the measuring cell where the microparticles are magnetically captured onto the surface of the electrode. Unbound substances are then removed with ProCell/ProCell M. Application of a voltage to the electrode then induces chemiluminescent emission which is measured by a photomultiplier.
- Results are determined via a calibration curve which is instrument-specifically generated by 2-point calibration and a master curve provided via the reagent barcode or e-barcode.

a) Tris(2,2'-bipyridyl)ruthenium(II)-complex ($Ru(bpy)_3^{2+}$)

Reagents - working solutions

The reagent rackpack is labeled as SCC.

M Streptavidin-coated microparticles (transparent cap), 1 bottle, 6.5 mL:
Streptavidin-coated microparticles 0.72 mg/mL; preservative.

R1 Anti-SCC-Ab~biotin (gray cap), 1 bottle, 9 mL:
Biotinylated monoclonal anti-SCC antibody (mouse) 0.9 mg/L; phosphate buffer 40 mmol/L, pH 7.5; preservative.

R2 Anti-SCC-Ab~$Ru(bpy)_3^{2+}$ (black cap), 1 bottle, 10 mL:
Monoclonal anti-SCC antibody (mouse) labeled with ruthenium complex 1.6 mg/L; phosphate buffer 40 mmol/L, pH 7.5; preservative.

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.

Avoid foam formation in all reagents and sample types (specimens, calibrators and controls).

Reagent handling

The reagents in the kit have been assembled into a ready-for-use unit that cannot be separated.

All information required for correct operation is read in from the respective reagent barcodes.

Storage and stability

Store at 2-8 °C.

Do not freeze.

Store the Elecsys reagent kit **upright** in order to ensure complete availability of the microparticles during automatic mixing prior to use.

Stability:	
unopened at 2-8 °C	up to the stated expiration date
after opening at 2-8 °C	12 weeks
on the analyzers	7 weeks

Specimen collection and preparation

Only the specimens listed below were tested and found acceptable.

Serum collected using standard sampling tubes or tubes containing separating gel.

Li-heparin, K_2-EDTA and K_3-EDTA plasma as well as Li-heparin plasma tubes containing separating gel.

Criterion: Slope 0.9-1.1, coefficient of correlation ≥ 0.95.

Stable for 14 days at 2-8 °C, 5 days at 20 °C, 12 weeks at -20 °C. The samples may be frozen once.

Acceptance criteria: For serum and plasma: < 1 ng/mL ± 0.2 ng/mL
> 1 ng/mL ± 15 %.

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.

Centrifuge samples containing precipitates before performing the assay.

Do not use heat-inactivated samples.

Do not use samples and controls stabilized with azide.

Ensure the samples, calibrators and controls are at 20-25 °C prior to measurement.

Due to possible evaporation effects, samples, calibrators and controls on the analyzers should be analyzed/measured within 2 hours.

Materials provided

See "Reagents – working solutions" section for reagents.

Materials required (but not provided)

- REF 07126999190, SCC CalSet, for 4 x 1.0 mL
- REF 07360070190, PreciControl Lung Cancer, for 4 x 3.0 mL or REF 07127006190, PreciControl SCC, for 4 x 1.0 mL
- REF 11732277122, Diluent Universal, 2 x 16 mL sample diluent or REF 03183971122, Diluent Universal, 2 x 36 mL sample diluent
- General laboratory equipment
- MODULAR ANALYTICS E170 or **cobas e** analyzer

Accessories for **cobas e** 411 analyzer:

- REF 11662988122, ProCell, 6 x 380 mL system buffer
- REF 11662970122, CleanCell, 6 x 380 mL measuring cell cleaning solution
- REF 11930346122, Elecsys SysWash, 1 x 500 mL washwater additive
- REF 11933159001, Adapter for SysClean
- REF 11706802001, AssayCup, 60 x 60 reaction cups
- REF 11706799001, AssayTip, 30 x 120 pipette tips
- REF 11800507001, Clean-Liner

Accessories for MODULAR ANALYTICS E170, **cobas e** 601 and **cobas e** 602 analyzers:

- REF 04880340190, ProCell M, 2 x 2 L system buffer
- REF 04880293190, CleanCell M, 2 x 2 L measuring cell cleaning solution
- REF 03023141001, PC/CC-Cups, 12 cups to prewarm ProCell M and CleanCell M before use
- REF 03005712190, ProbeWash M, 12 x 70 mL cleaning solution for run finalization and rinsing during reagent change
- REF 03004899190, PreClean M, 5 x 600 mL detection cleaning solution
- REF 12102137001, AssayTip/AssayCup, 48 magazines x 84 reaction cups or pipette tips, waste bags
- REF 03023150001, WasteLiner, waste bags
- REF 03027651001, SysClean Adapter M

Accessories for all analyzers:

- REF 11298500316, ISE Cleaning Solution/Elecsys SysClean, 5 x 100 mL system cleaning solution

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.

Resuspension of the microparticles takes place automatically prior to use. Read in the test-specific parameters via the reagent barcode. If in exceptional cases the barcode cannot be read, enter the 15-digit sequence of numbers (except for the **cobas e** 602 analyzer).

MODULAR ANALYTICS E170, **cobas e** 601 and **cobas e** 602 analyzers: PreClean M solution is necessary.

Bring the cooled reagents to approximately 20 °C and place on the reagent disk (20 °C) of the analyzer. Avoid foam formation. The system

automatically regulates the temperature of the reagents and the opening/closing of the bottles.

Calibration

Traceability: This method has been standardized against the ARCHITECT SCC assay from Abbott Diagnostics.

Every Elecsys reagent set has a barcoded label containing specific information for calibration of the particular reagent lot. The predefined master curve is adapted to the analyzer using the relevant CalSet.

Calibration frequency: Calibration must be performed once per reagent lot using fresh reagent (i.e. not more than 24 hours since the reagent kit was registered on the analyzer). Renewed calibration is recommended as follows:

- after 4 weeks when using the same reagent lot
- after 7 days (when using the same reagent kit on the analyzer)
- as required: e.g. quality control findings outside the defined limits

Quality control

For quality control, use PreciControl Lung Cancer.

In addition, other suitable control material can be used.

Controls for the various concentration ranges should be run individually at least once every 24 hours when the test is in use, once per reagent kit, and following each calibration.

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.

If necessary, repeat the measurement of the samples concerned.

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

Calculation

The analyzer automatically calculates the analyte concentration of each sample in ng/mL.

Limitations - interference

The effect of the following substances and pharmaceuticals on assay performance was tested. Interferences were tested up to the listed concentrations and no impact on results was observed.

Criterion: Recovery ± 0.2 ng/mL of initial value ≤ 1 ng/mL and within ± 10 % of initial value > 1 ng/mL.

Substances:

Compound	Concentration tested
Bilirubin	≤ 20 mg/dL or ≤ 342 µmol/L
Hemoglobin	≤ 1000 mg/dL or ≤ 0.625 mmol/L
Intralipid	≤ 1000 mg/dL
Biotin	≤ 70 ng/mL
Rheumatoid factors	≤ 1200 IU/mL
IgG	≤ 70 g/L
IgA	≤ 5 g/L
IgM	≤ 10 g/L
Albumin	≤ 70 g/L

Samples should not be taken from patients receiving therapy with high biotin doses (i.e. > 5 mg/day) until at least 8 hours following the last biotin administration.

There is no high-dose hook effect at SCCA concentrations up to 1000 ng/mL.

In vitro tests were performed on 16 commonly used pharmaceuticals as well as on special cancer drugs used in the therapy of lung, cervical and head & neck cancers.

Commonly used pharmaceuticals:

Pharmaceutical	Concentration tested
Acetylcystein	1660 mg/L
Ampicillin-Na	1000 mg/L
Ascorbic acid	300 mg/L
Cyclosporine	5 mg/L
Cefoxitin	2500 mg/L
Heparin	5000 U/L
Levodopa	20 mg/L
Methyldopa	20 mg/L
Metronidazole	200 mg/L
Phenylbutazone	400 mg/L
Doxycyclin	50 mg/L
Acetylsalicylic acid	1000 mg/L
Rifampicin	60 mg/L
Acetaminophen	200 mg/L
Ibuprofen	500 mg/L
Theophylline	100 mg/L

Special cancer drugs (primarily used in the therapy of lung, cervical and head & neck cancers):

Drug	Concentration tested
5-Fluorouracil	900 mg/L
Bevacizumab	700 mg/L
Carboplatin	600 mg/L
Cetuximab	600 mg/L
Cisplatin	180 mg/L
Cyclophosphamide	500 mg/L
Dexamethasone	20 mg/L
Docetaxel	112.5 mg/L
Doxorubicin	120 mg/L
Epoetin alfa	0.378 mg/L
Erlotinib	150 mg/L
Etoposide	300 mg/L
Gefitinib	250 mg/L
Gemcitabine hydrochloride	1500 mg/L
Ifosfamide	7200 mg/L
Methotrexate	150 mg/L
Metoclopramide	7.5 mg/L
Neupogen	0.9 mg/L
Paclitaxel	265 mg/L
Topotecan hydrochloride	2.25 mg/L
Vincristine sulfate	3 mg/L
Vinorelbine tartrate	53.1 mg/L

In rare cases, interference due to extremely high titers of antibodies to analyte-specific antibodies, streptavidin or ruthenium can occur. These effects are minimized by suitable test design.

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

Limits and ranges

Measuring range

0.1-70 ng/mL (defined by the Limit of Blank and the maximum of the master curve). Values below the Limit of Blank are reported as < 0.1 ng/mL. Values

above the measuring range are reported as > 70 ng/mL (or up to 1400 ng/mL for 20-fold diluted samples).

Lower limits of measurement

Limit of Blank, Limit of Detection and Limit of Quantitation

The Elecsys SCC assay is designed to have the following lower limits of measurement:

Limit of Blank = 0.1 ng/mL

Limit of Detection = 0.2 ng/mL

Limit of Quantitation = 0.6 ng/mL with a coefficient of variation of ≤ 20 %

The Limit of Blank, Limit of Detection and Limit of Quantitation were determined in accordance with the CLSI (Clinical and Laboratory Standards Institute) EP17-A2 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 defined as the lowest amount of analyte in a sample that can be accurately quantitated with a coefficient of variation of ≤ 20 %.

An internal study was performed based on guidance from the CLSI, protocol EP17-A2. Limit of Blank and Limit of Detection were determined to be the following:

	cobas e 411 analyzer	MODULAR ANALYTICS E170, **cobas e** 601, **cobas e** 602 analyzers
Limit of Blank (ng/mL)	0.066	0.051
Limit of Detection (ng/mL)	0.086	0.083

For Limit of Quantitation ≥ 4 human serum samples were measured over 5 days in 5 replicates on 1 analyzer. With an intermediate precision of ≤ 20 % the Limit of Quantitation was 0.24 ng/mL.

Linearity

The Elecsys SCC assay is linear across the measuring range from 0.1-70 ng/mL. Samples were prepared according to CLSI EP6-A by diluting 3 serum and 3 plasma samples each with Diluent Universal in multiple steps ranging from > 70 ng/mL downwards to Limit of Blank.

Dilution

Samples with SCCA concentrations above the measuring range can be diluted with Diluent Universal. The recommended dilution is 1:20 (either automatically by the analyzers or manually). The concentration of the diluted sample must be > 3 ng/mL.

After manual dilution, multiply the result by the dilution factor.

After dilution by the analyzers, the software automatically takes the dilution into account when calculating the sample concentration.

Expected values

Caucasians:
A study in Europe at 3 sites with the Elecsys SCC assay on 153 serum samples from apparently healthy Caucasian adults (75 males, 78 females) aged between 20 and 79 years yielded the following results:

SCCA (ng/mL)			
5th percentile	**Median**	**95th percentile (95 % CI[b])**	**97.5th percentile (95 % CI)**
0.6	1.1	2.3 (1.9-3.8)	2.7 (2.2-4.4)

b) CI = confidence interval

Chinese:
A study in China with the Elecsys SCC assay on 146 serum or plasma samples from apparently healthy Chinese adults (55 males, 91 females) aged between 20 and 70 years yielded the following results:

SCCA (ng/mL)			
5th percentile	**Median**	**95th percentile (95 % CI)**	**97.5th percentile (95 % CI)**
0.5	1.1	2.7 (2.2-3.3)	3.0 (2.5-4.1)

It is recommended that each laboratory establishes its own expected reference range for the population of interest.

SCCA values in different cohorts (healthy, benign and malignant)
The distribution in percentage (%) of SCC assay values determined in 5 clinical centers in Europe and China with the Elecsys SCC assay in 1751 serum and 223 plasma specimens is summarized in the table below:

	N	Proportion > 2.3 ng/mL (%)	Mean	SD	25th percentile	Median	75th percentile
Benign conditions							
Lung diseases	123	8.9	1.4	1.30	0.8	1.1	1.6
Gynecological diseases	60	6.7	1.3	0.73	0.9	1.2	1.4
Skin diseases	24	54.2	2.8	1.37	1.6	2.5	3.8
Renal diseases	44	50.0	5.4	6.7	1.5	2.3	4.9
Liver diseases	39	23.1	1.7	0.84	1.0	1.5	2.1
Cancer							
SCC subtype of NSCLC	215	43.3	5.0	8.64	1.2	1.9	4.3
NSCLC adenocarcinoma	261	14.6	2.5	8.3	0.7	1.0	1.7
SCLC	189	10.1	1.3	1.54	0.7	1.0	1.5
SCC of uterine cervix	127	67.7	17.4	36.50	1.6	7.4	19.7
SCC of head & neck	154	40.3	2.7	2.95	1.3	2.0	2.9
Other malignancies*	203	22.7	2.6	4.72	0.8	1.2	1.9

* Other malignancies contain urological, gynecological, gastrointestinal, and skin tumors, neuroendocrine tumors (NET), medullary carcinoma of the thyroid (MCT) and mesothelioma.

Correlation of SCCA values in different types of benign and malignant disorders of the lung
The correlation of Elecsys SCCA values and stage for all 726 patients is shown in the following table:

Stage	**N**	**Mean SCCA ng/mL**
Stage I-II SCC	40	2.15
Stage III SCC	131	5.54
Stage IV SCC	39	6.29
Other NSCLC subtypes than SCC	393	2.62
Benign lung diseases	123	1.39

The sensitivity of SCC in lung cancer patients with stage I-IV SCC vs. benign lung diseases at the set specificity of 95 % as well as the AUC (area under the curve) values are shown in the table below:

	Cut-off ng/mL	**Sensitivity (%) (95 % CI)**	**AUC (95 % CI)**
SCC of the lung (all stages) vs. benign lung diseases	2.6	39.1 (32.5-45.9)	0.738 (0.686-0.791)

Correlation of SCCA values in different types of benign and malignant disorders of the uterine cervix
The correlation of Elecsys SCCA values and stage for all 216 patients is shown in the following table:

Stage	N	Mean SCCA ng/mL
Stage I-II SCC	76	8.35
Stage III SCC	34	17.13
Stage IV SCC	16	54.40
Other gynecological cancers than SCC	30	3.33
Benign gynecological diseases	60	1.30

The sensitivity of SCC in cervical cancer patients with stage I-IV SCC vs. benign gynecological diseases at the set specificity of 95 % as well as the AUC values are shown in the table below:

	Cut-off ng/mL	Sensitivity (%) (95 % CI)	AUC (95 % CI)
SCC of the uterine cervix (all stages) vs. benign gynecological diseases	2.8	61.4 (52.4-69.9)	0.863 (0.812-0.913)

The following has to be taken into consideration

- If the SCCA results are inconsistent with clinical evidence, additional testing is suggested to confirm the result.
- For diagnostic purposes, results should be used in conjunction with other data, e.g., symptoms, results of other tests, clinical impressions, etc.
- Increased concentrations of SCCA have been observed in patients with renal dysfunction and benign skin diseases. There is a significant correlation between serum SCCA levels and serum creatinine concentrations in patients with renal dysfunction.[35] The evaluation of serum creatinine levels should be considered in cases of high SCCA levels that are not consistent with diagnostic and clinical characteristics of the patient.
- SCCA levels are also sensitive to blood collection timing (before vs. after anesthesia) and procedure (venous vs. arterial vessel puncture).[36]
- SCCA levels, regardless of value, should not be interpreted as absolute evidence for the presence or absence of a malignant disease. In patients with suspected or known cancer, other tests and procedures must also be considered for diagnosis and good management.
- The concentration of SCCA in a given specimen, determined with assays from different manufacturers, can vary due to differences in assay methods, calibration, and reagent specificity.

Specific performance data

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

Precision

Precision was determined using Elecsys reagents, samples and controls in a protocol (EP05-A3) of the CLSI (Clinical and Laboratory Standards Institute): 2 runs per day in duplicate each for 21 days (n = 84). The following results were obtained:

cobas e 411 analyzer					
		Repeatability		**Intermediate precision**	
Sample	Mean ng/mL	SD ng/mL	CV %	SD ng/mL	CV %
Human serum 1	0.570	0.022	3.8	0.027	4.8
Human serum 2	1.70	0.028	1.7	0.049	3.0
Human serum 3	2.00	0.036	1.8	0.062	3.1
Human serum 4	39.0	0.61	1.6	0.89	2.3

cobas e 411 analyzer					
		Repeatability		**Intermediate precision**	
Sample	Mean ng/mL	SD ng/mL	CV %	SD ng/mL	CV %
Human serum 5	61.7	0.696	1.1	1.28	2.0
PreciControl LC[c)] 1	1.75	0.020	1.1	0.047	2.7
PreciControl LC 2	20.5	0.197	1.0	0.575	2.8

c) LC = Lung Cancer (multimarker control incl. the Elecsys biomarkers CYFRA 21-1, NSE, ProGRP and SCC)

MODULAR ANALYTICS E170, **cobas e** 601 and **cobas e** 602 analyzers					
		Repeatability		**Intermediate precision**	
Sample	Mean ng/mL	SD ng/mL	CV %	SD ng/mL	CV %
Human serum 1	0.513	0.020	3.9	0.022	4.2
Human serum 2	1.60	0.031	1.9	0.033	2.1
Human serum 3	1.89	0.038	2.0	0.046	2.5
Human serum 4	39.7	0.691	1.7	0.800	2.0
Human serum 5	66.9	0.927	1.4	1.22	1.8
PreciControl LC 1	1.64	0.023	1.4	0.034	2.1
PreciControl LC 2	19.8	0.249	1.3	0.354	1.8

Method comparison

A comparison of the Elecsys SCC assay (y) with the ARCHITECT SCC method (x) using clinical samples gave the following correlations:

Number of serum samples measured: 193

Passing/Bablok[37]

y = 1.13x + 0.15

r = 0.937

The sample concentrations were between 0.3 and 68.7 ng/mL.

A comparison of the Elecsys SCC assay (y) with the Kryptor SCC method (x) using clinical samples gave the following correlations:

Number of samples measured: 180

Passing/Bablok[37]

y = 1.50x + 0.48

r = 0.988

The sample concentrations were between 0.5 and 70 ng/mL.

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