External Quality Assessment for Calibration Laboratories in Laboratory Medicine

- RELA -

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RELA – Surveys

www.dgkl-rfb.de

Home

Welcome

login

Registration/ Accou

RELA in progress

order RELA 2014

enter RELA 2014 results

former RELA results

Choose year...

RELA - IFCC External Quality assessment scheme for Reference Laboratories in Laboratory Medicine

This site gives you all the information you will need for participating in the RELA scheme.

Time schedule for the annual surveys (may vary slightly)

Announcement: September 1
Deadline for ordering: September 30
Shipment of samples: October 15
Deadline for transmission of results: April 15 (following year)
Reporting results to participants: May 15
Publishing results on this website: June 15

Please refer to the navigation area on the left to (for instructions see our new RELA web manual)
- register or log in
- order the survey
- entering your results
- get the evaluation of past surveys

The whole RELA process is described in detail in the **IFCC-RELA-EQAS procedure manual**.

Offered measurands:
Metabolites and substrates (META): total cholesterol, LDL-cholesterol, HDL-cholesterol, total glycerol, creatinine, uric acid, urea, glucose, total bilirubine
Electrolytes (ELEC): sodium, potassium, chloride, calcium, lithium, magnesium
Enzymes (ENZY): ALT, AP, AST, CK, LDH, GGT, amylase
Glycated hemoglobins (GLYC): HbA1c
Proteins (PROT): total protein
Hormones (HORM): aldosterone, cortisol, progesterone, testosterone, estradiol-17ß, estriol, 17-OH-progesterone
Thyroid hormones (THYR): total thyroxine (TT4), total tri-iodthyronine (TT3), free thyroxine (ft4)
Therapeutic drugs (THER): digoxin, digitoxin, theophylline
Vitamins (VITA): 25-OH-vitamin D3

RELA – Annual Process

Each participant receives two different control materials.

The analysis has to be performed under the same conditions as for providing reference measurement procedure values for a customer.

This requires a reasonable number of repetitive measurements under reproducibility conditions - e.g. using separate calibrations – in order to calculate an expanded uncertainty.

Therefore, 5 vials of each individual sample are provided.

Documents for shipment on request in advance

Proforma Invoice

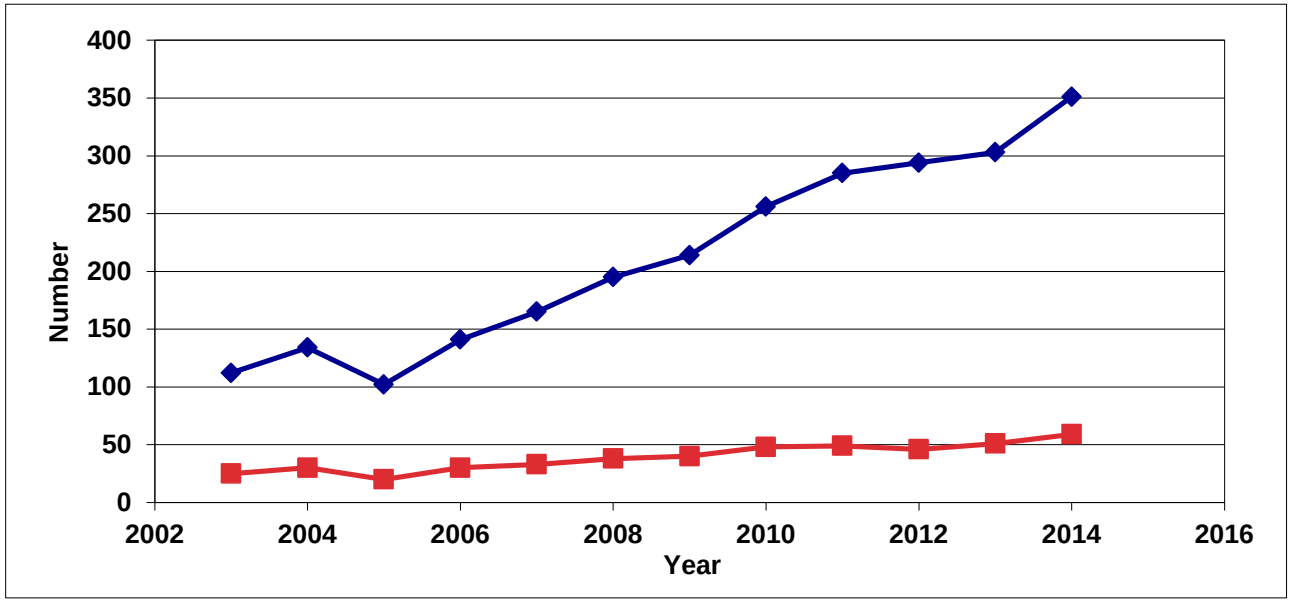
Material Safety Data Sheet

Declaration of non-objection

Certificate of Accreditation of RfB

Individual Contracts

RELA – Participants and Results



Number of results:

2003	111
2014	351

Number of participants:

2003	25
2014	55

10 participants are accredited according to ISO 17025 and ISO 15195 and listed in the JCTLM database.

Europe	18 laboratories (2 NMIs)
North America	2 laboratories
South America	1 laboratory
Asia (except China)	4 laboratories (1 NMI)
China	30 laboratories

RELA - Measurands

Metabolite & Substrates	Electrolytes	Enzymes	Hormones	Thyroid Hormones
Creatinine	Calcium	ALT	17OH-Progesterone	Total Thyroxine
Glucose	Chloride	AST	Alsosterone	Total Triiodothyronine
Total Bilirubin	Lithium	CK	Cortisol	*Free Thyroxine*
Total Cholestrol	Magnesium	GGT	Estradiol-17b	
Total Glycerol	Potassium	LDH	Estriol	
Urea	Sodium	Amylase	Progesterone	
Uric Acid		ALP	Testosterone	
LDL				
HDL				

Therapeutic Drugs	Proteins	Glycated Proteins	Vitamines
Digoxin	Total Proteins	HbA1c	25OH-Vitamin D3
Digitoxin			
Theophylline			

RELA Participation – Part 1

Measurand	2003	...	2011	2012	2013	2014	2015	JCTLM listed services 2013	JCTLM listed services 2015
META & SUB									
Creatinine	3		4	7	12	11		5	6
Glucose	3		14	24	13	18		6	8
Total Bilirubin	2		11	10	9	7		1	1
Total Cholesterol	9		12	11	8	10		7	7
HDL cholesterol						2			1
Total Glycerol	2		4	7	6	4		3	4
Urea	3		8	11	9	11		3	5
Uric Acid	5		5	10	14	8		3	5
Electrolytes									
Calcium	1		4	3	7	5		2	3
Chloride	3		5	4	6	4		1	1
Lithium	2		3	3	4	3		2	3
Magnesium	1		3	2	5	5		2	3
Potassium	4		10	5	7	9		4	4
Sodium	6		8	6	6	10		4	4
Enzymes									
ALT	10		22	22	22	28		5	7
Amylase	2		17	18	22	16		3	5
ALP			15	17	18	18		3	5
AST	4		29	22	21	27		5	7
CK	4		21	18	19	26		5	7
GGT	5		20	27	21	27		5	7
LDH	4		24	21	20	24		5	7

RELA Participation – Part 2

Measurand	2003	2011	2012	2013	2014	2015	JCTLM listed services 2013	JCTLM listed services 2015
Proteins								
Total Proteins	2	13	13	17	17		1	2
Hormones								
17OH-Progesterone	1	1	1	1	1		1	1
Aldosterone	1	1	1	1	1		1	1
Cortisol	3	3	1	7	3		4	4
Estradiol-17b	1	3	4	2	4		2	2
Estriol	1	1	2	1	2		1	1
Progesterone	3	2	2	3	4		2	2
Testosterone	1	5	1	2	3		3	4
Thyroid Hormones								
Total Thyroxine	1	4	4	3	5		2	3
Total Triiodothyronine	-	1	2	2	1		2	2
Therap. Drugs								
Digoxin	1	1	2	2	2		1	1
Digitoxin	3	2	2	3	2		1	1
Theophylline		2	2	2	1		1	1
Glyc. Proteins								
HbA1c	3	7	8	8	11		3	4
Vitamines								
25OH-Vitamin D3			1	0	2		1	1

RELA Results
- Examples -

Key Measurands RELA 2014

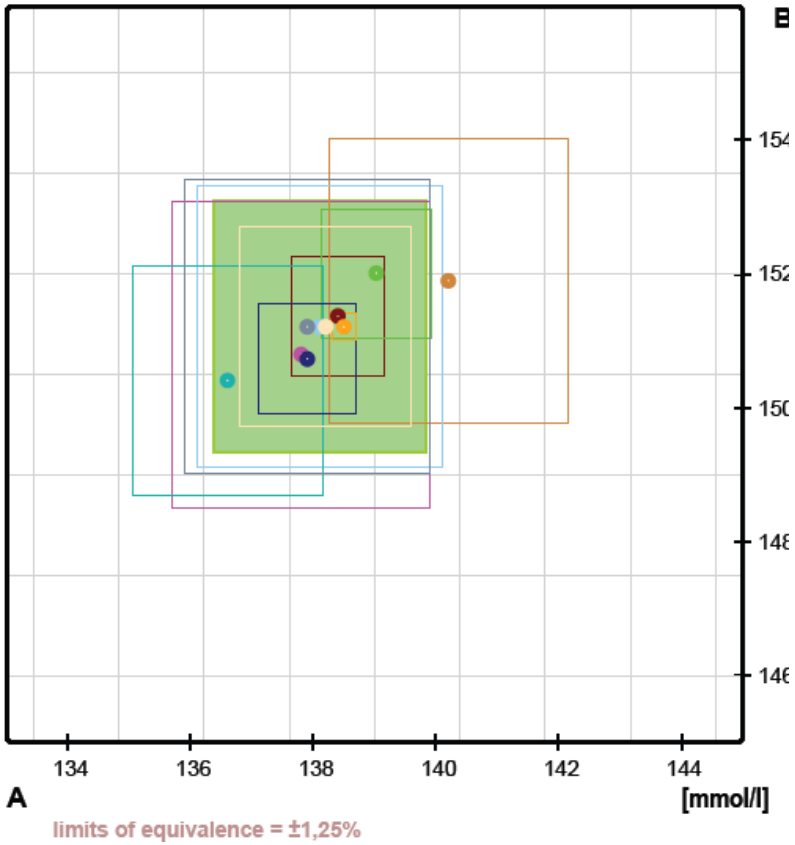
Sodium

Progesterone

Total Cholesterol

CK

Publication of RELA Results
- Sodium as an example -



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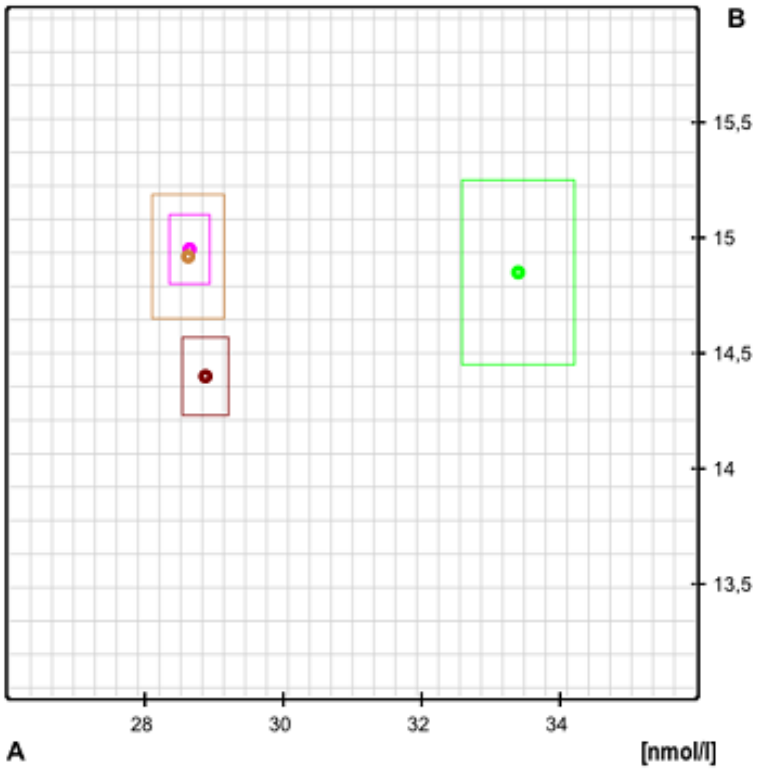
RELA 2014
21.09.15

LabCode	A	e.u.	B	e.u.	method
003	137,8	2,1	150,8	2,3	ICP-OES
008	138,39	0,75	151,36	0,89	ICP OES after digestion of organic sampl
016	140,2	1,96	151,9	2,13	FES
018	139,03	0,89	152,01	0,97	ICP/MS
024	138,1	2,0	151,2	2,1	FES
025	136,6	1,558	150,4	1,715	FES
027	138,2	1,4	151,2	1,5	ICP-SFMS
039	137,9	2,0	151,2	2,2	flame atomic emission spectroscopy
087	137,91	0,812	150,72	0,83	Ion chromatography
138	138,5	0,2	151,2	0,2	FES

Use of Limits of Equivalence
- Progesterone as an example -



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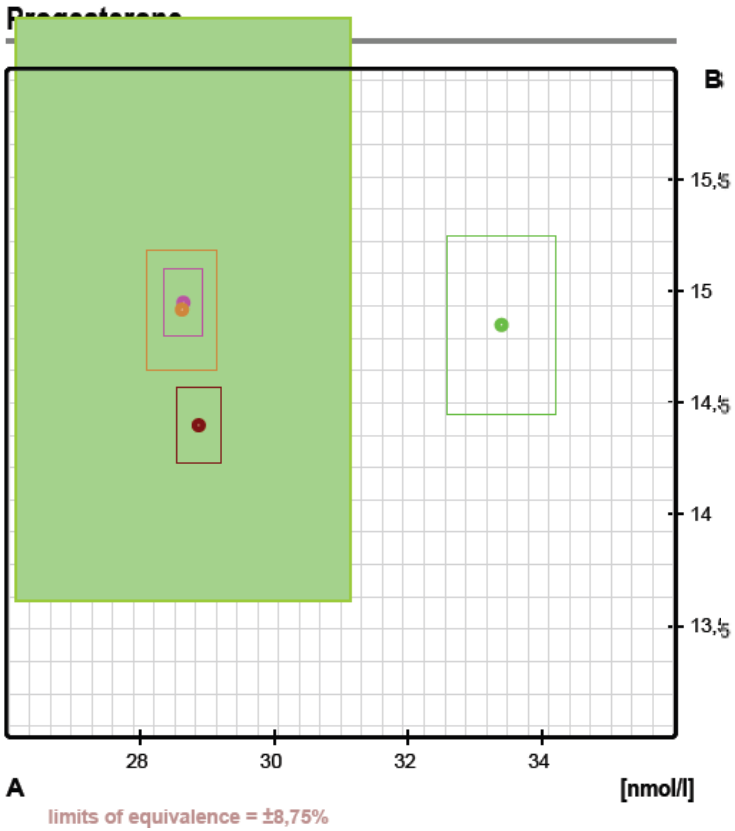
RELA 2014
21.09.15

LabCode	A	e.u.	B	e.u.	method
001	**28,64**	0,29	**14,95**	0,15	ID/GC/MS
018	**28,88**	0,33	**14,4**	0,17	ID/LC/MS/MS
027	**28,62**	0,52	**14,92**	0,27	ID/GC/MS
054	**33,39**	0,81	**14,85**	0,4	ID/LC/MS/MS

Use of Limits of Equivalence
- Progesterone as an example -



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RELA 2014
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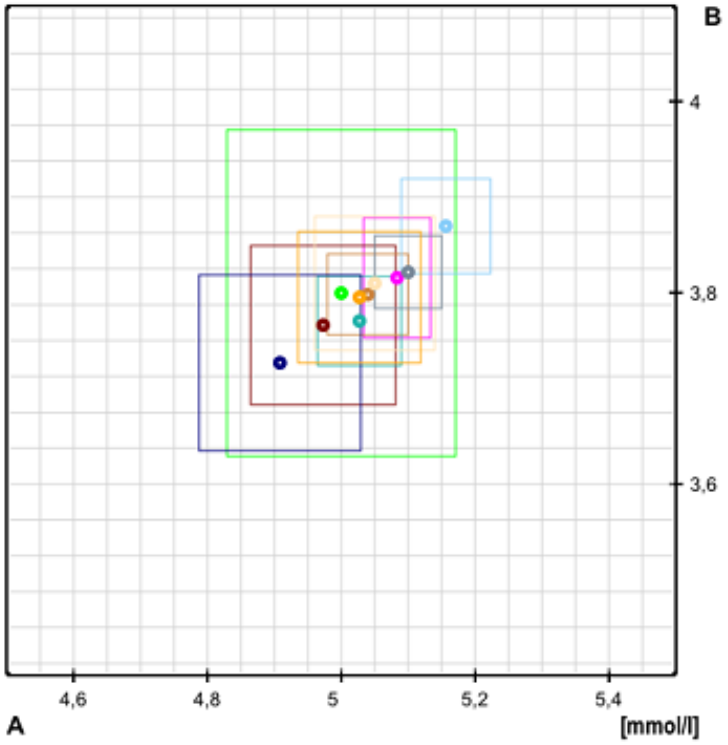
LabCode	A	e.u.	B	e.u.	method
001	28,64	0,29	14,95	0,15	ID/GC/MS
018	28,88	0,33	14,4	0,17	ID/LC/MS/MS
027	28,62	0,52	14,92	0,27	ID/GC/MS
054	33,39	0,81	14,85	0,4	ID/LC/MS/MS

Different Methods

- Example: Total Cholesterol -



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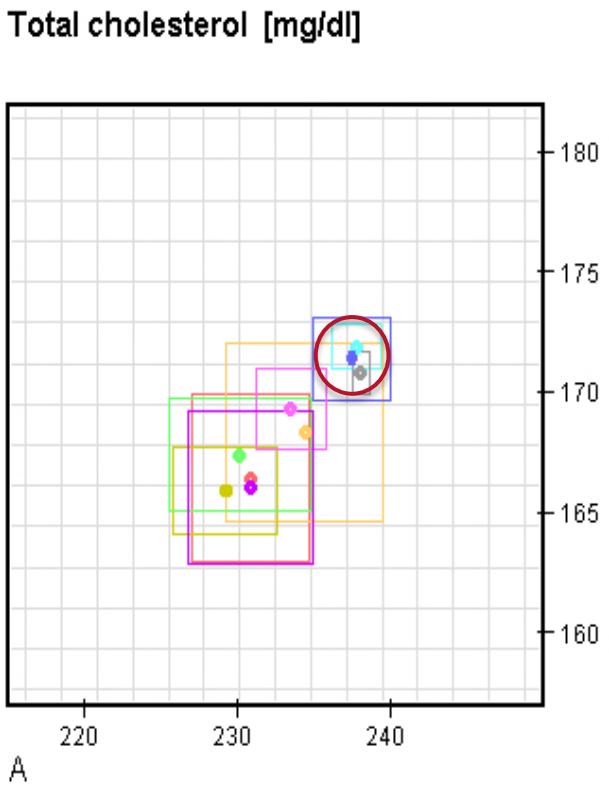
RELA 2014
21.09.15

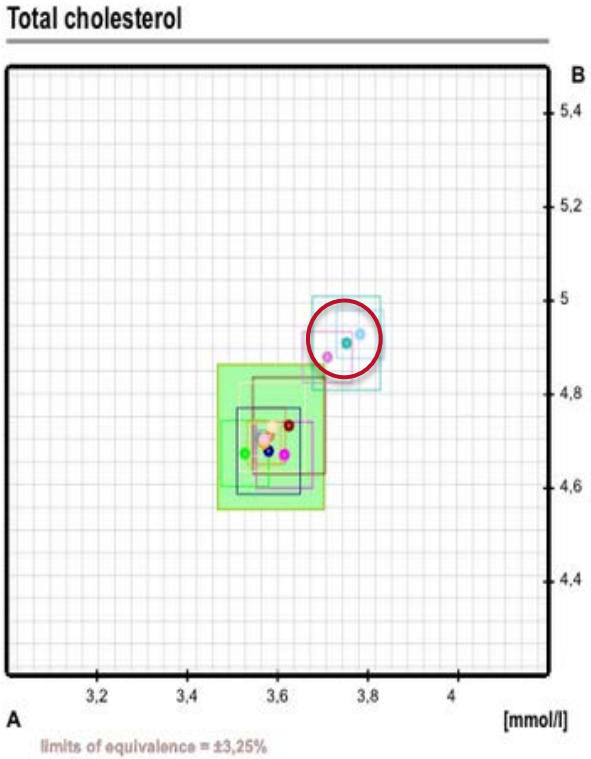
LabCode	A	e.u.	B	e.u.	method
001	5,084	0,051	3,815	0,062	ID/GC/MS
005	4,972	0,109	3,765	0,082	ID/GC/MS
008	5,04	0,060	3,798	0,043	ID/GC/MS
012	5,0	0,171	3,8	0,171	Abell/Kendall
016	5,157	0,067	3,869	0,050	spectrophotometry
018	5,028	0,063	3,771	0,047	HPLC
025	5,05	0,090	3,81	0,070	ID/GC/MS
027	5,101	0,051	3,822	0,038	ID/GC/MS
119	4,908	0,121	3,727	0,092	spectrophotometry
121	5,027	0,092	3,794	0,067	ID/GC/MS

Different Methods

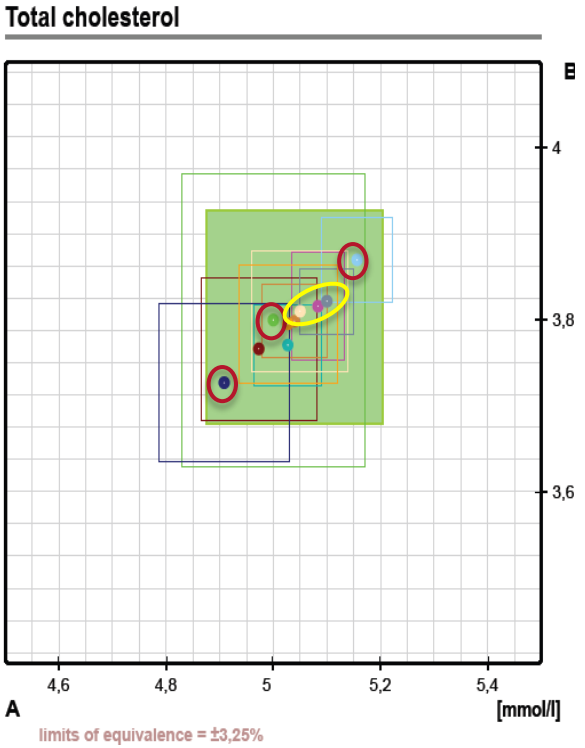
- Example: Total Cholesterol -



RELA 2003

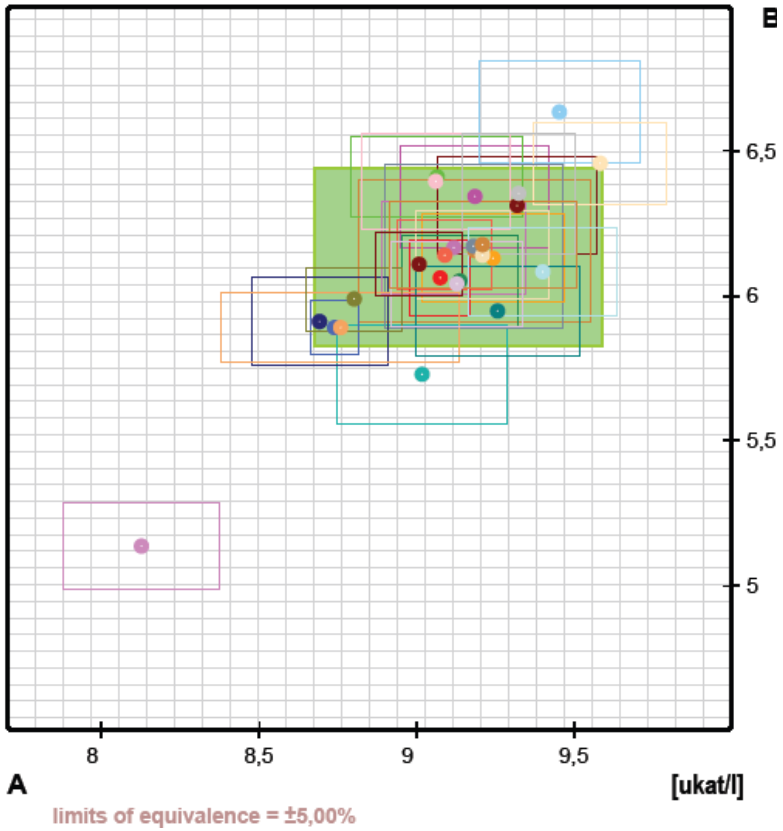


RELA 2009



RELA 2014

Enzymes

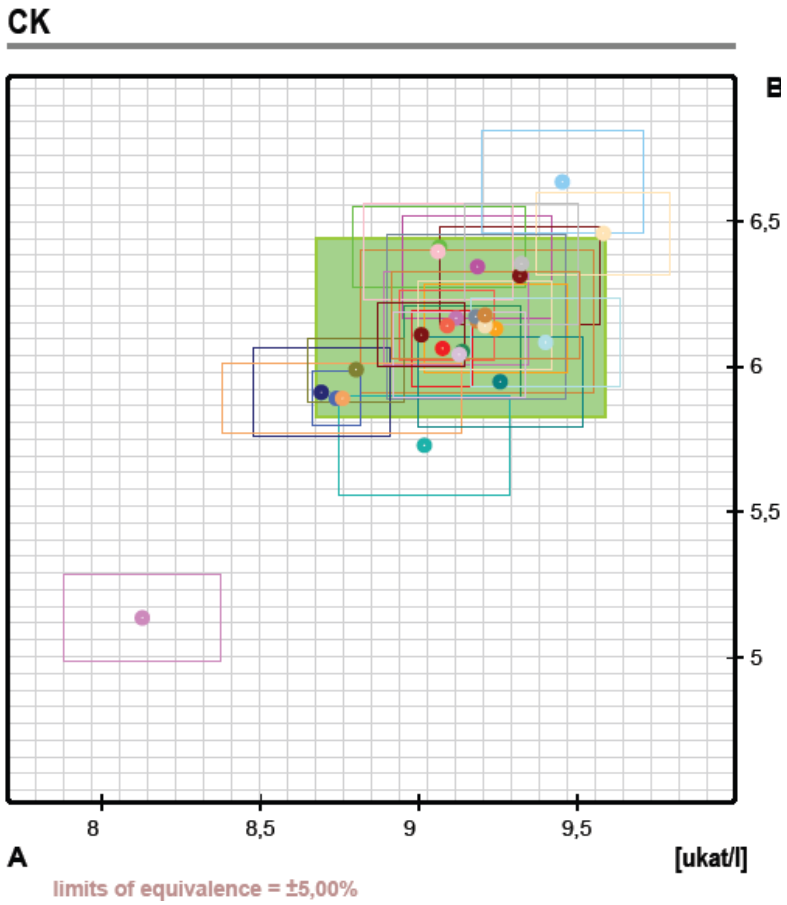


ifcc International Federation of Clinical Chemistry and Laboratory Medicine

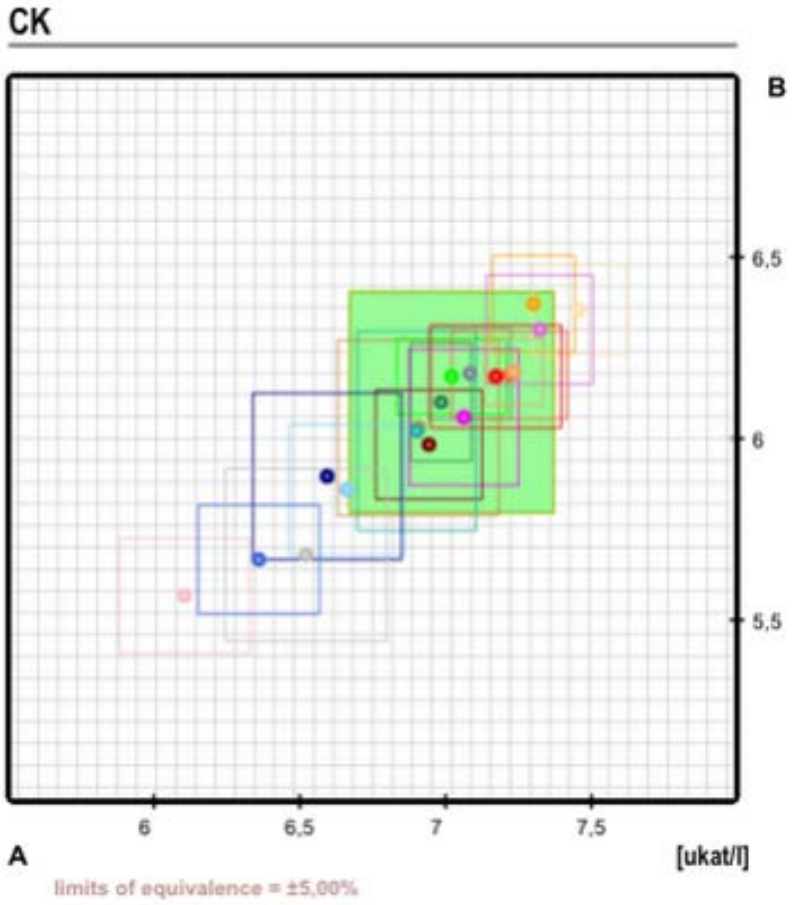
RELA 2014
21.09.15

LabCode	A	e.u.	B	e.u.	method
003	9,185	0,233	6,341	0,178	Kinetic spectroscopy
006	9,321	0,255	6,314	0,164	Kinetic spectroscopy
016	9,185	0,367	6,156	0,246	Kinetic spectroscopy
018	9,064	0,272	6,409	0,141	Kinetic spectroscopy
027	9,451	0,255	6,634	0,178	Kinetic spectroscopy
041	9,02	0,27	5,73	0,17	Kinetic spectroscopy
046	9,583	0,211	6,456	0,142	Kinetic spectroscopy
047	9,182	0,281	6,171	0,28	Kinetic spectroscopy
051	8,69	0,218	5,913	0,15	Kinetic spectroscopy
054	9,241	0,223	6,132	0,152	Kinetic spectroscopy
055	9,117	0,228	6,165	0,16	Kinetic spectroscopy
061	9,061	0,237	6,395	0,168	Kinetic spectroscopy
063	9,088	0,15	6,142	0,12	Kinetic spectroscopy
064	8,74	0,075	5,89	0,092	Kinetic spectroscopy
065	9,077	0,097	6,065	0,128	Kinetic spectroscopy
073	8,76	0,38	5,891	0,122	Kinetic spectroscopy
074	9,137	0,181	6,051	0,158	Kinetic spectroscopy
077	9,323	0,178	6,353	0,21	Kinetic spectroscopy
083	8,127	0,249	5,136	0,150	kinetic spectroscopy
087	9,209	0,21	6,14	0,15	Kinetic spectroscopy
098	8,804	0,153	5,992	0,108	Kinetic spectroscopy
103	9,259	0,26	5,949	0,157	Kinetic spectroscopy
104	9,127	0,212	6,044	0,148	Kinetic spectroscopy
131	9,4	0,235	6,084	0,152	Kinetic spectroscopy
135	9,211	0,298	6,176	0,153	Kinetic spectroscopy
138	9,01	0,14	6,11	0,11	Kinetic spectroscopy

Enzymes

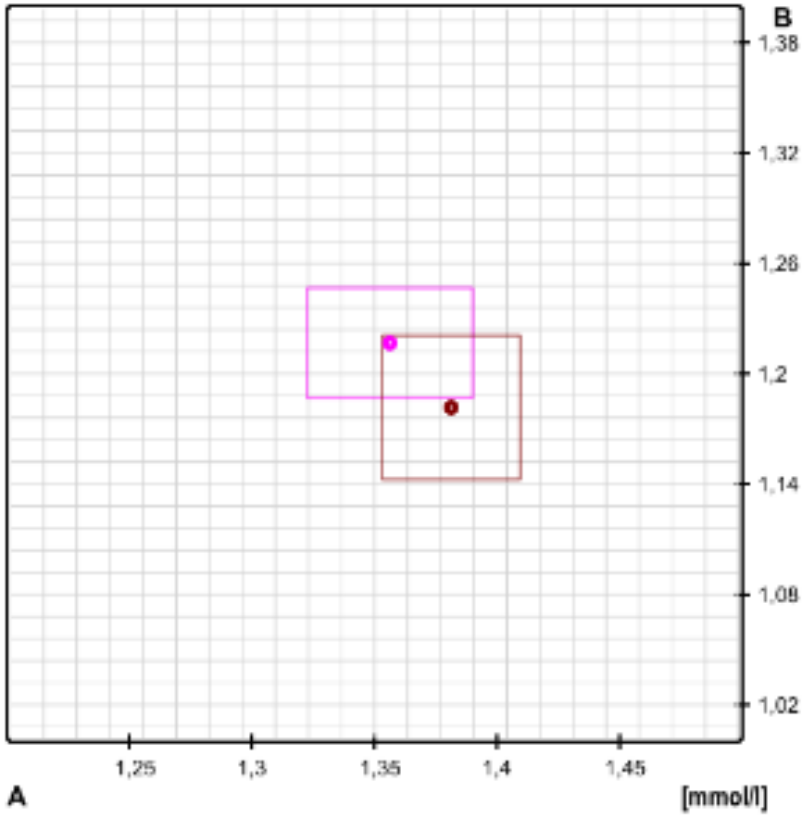


RELA 2014



RELA 2013

First survey for HDL/LDL cholesterol



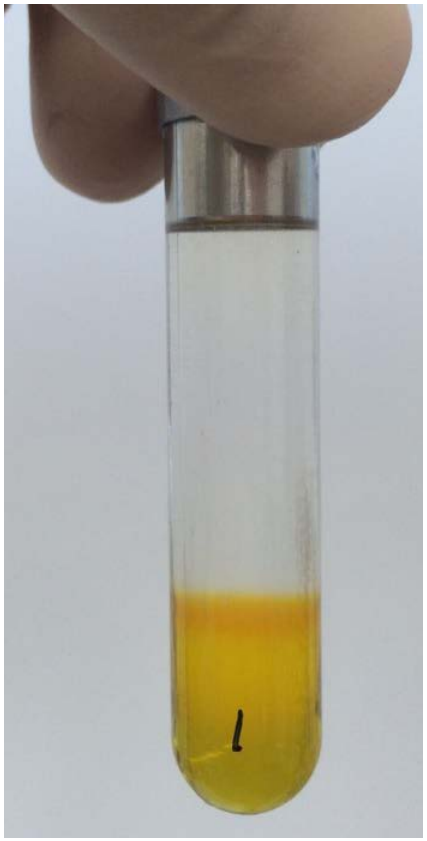
IFCC

RELA 2014
21.09.15

LabCode	A	e.u.	B	e.u.	method
016	1,356	0,034	1,217	0,030	spectrophotometry
105	1,381	0,028	1,182	0,039	Beta-Quantification

First survey for HDL/LDL cholesterol

RELA 2014
Samples A and B



Patient sample

RELA – Interested Parties

The RELA surveys address:

- Calibration laboratories providing their service to organiser of external quality assessment schemes,
- Calibration laboratories of manufacturers,
- Candidate laboratories which are investigating a new analytical principle,
- Customers looking for support of calibration laboratories,
- JCTLM review teams,
- Auditors of accreditation bodies.

Conclusions

RELA is an EQA scheme for calibration laboratories to demonstrate their performance.

Links between calibration laboratories and national metrology institutes can be visualized.

JCTLM and RELA can support the implementing of concepts of traceability and standardization to health systems.