

International EQA surveys for calibration laboratories

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RMV in EQA Schemes for Routine Labs

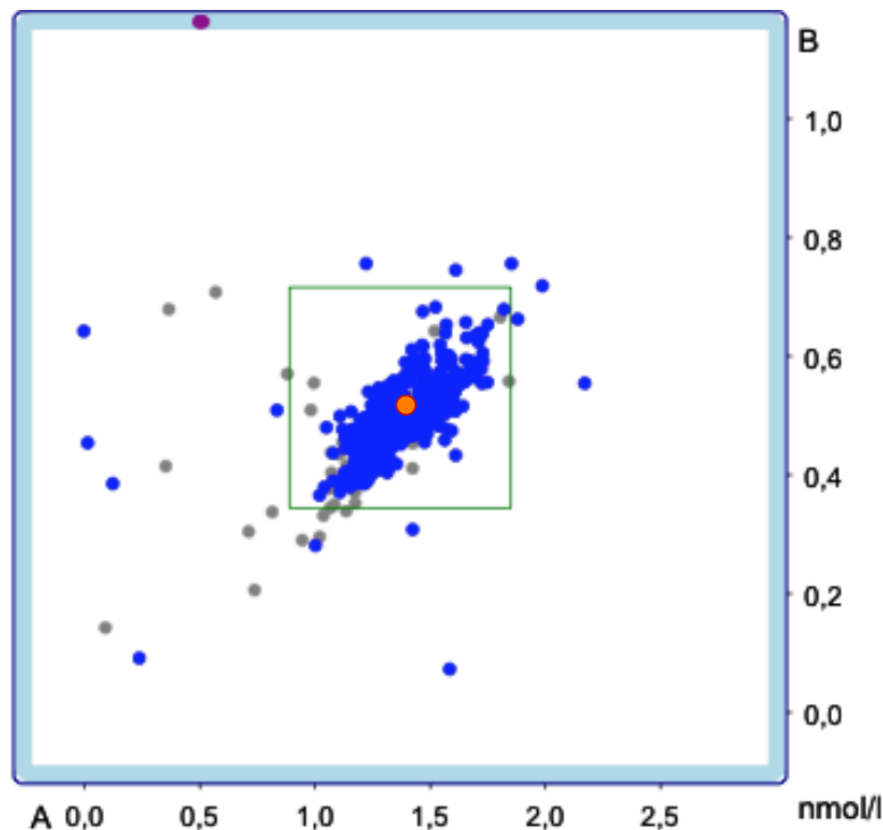
HM4/17

Estradiol-17beta

Lumineszenzmessung

Split 1

R f B



680 participants

Measurement principles:

Luminescence detection

Radioactivity detection

Fluorescence detection

Mass spectrometry

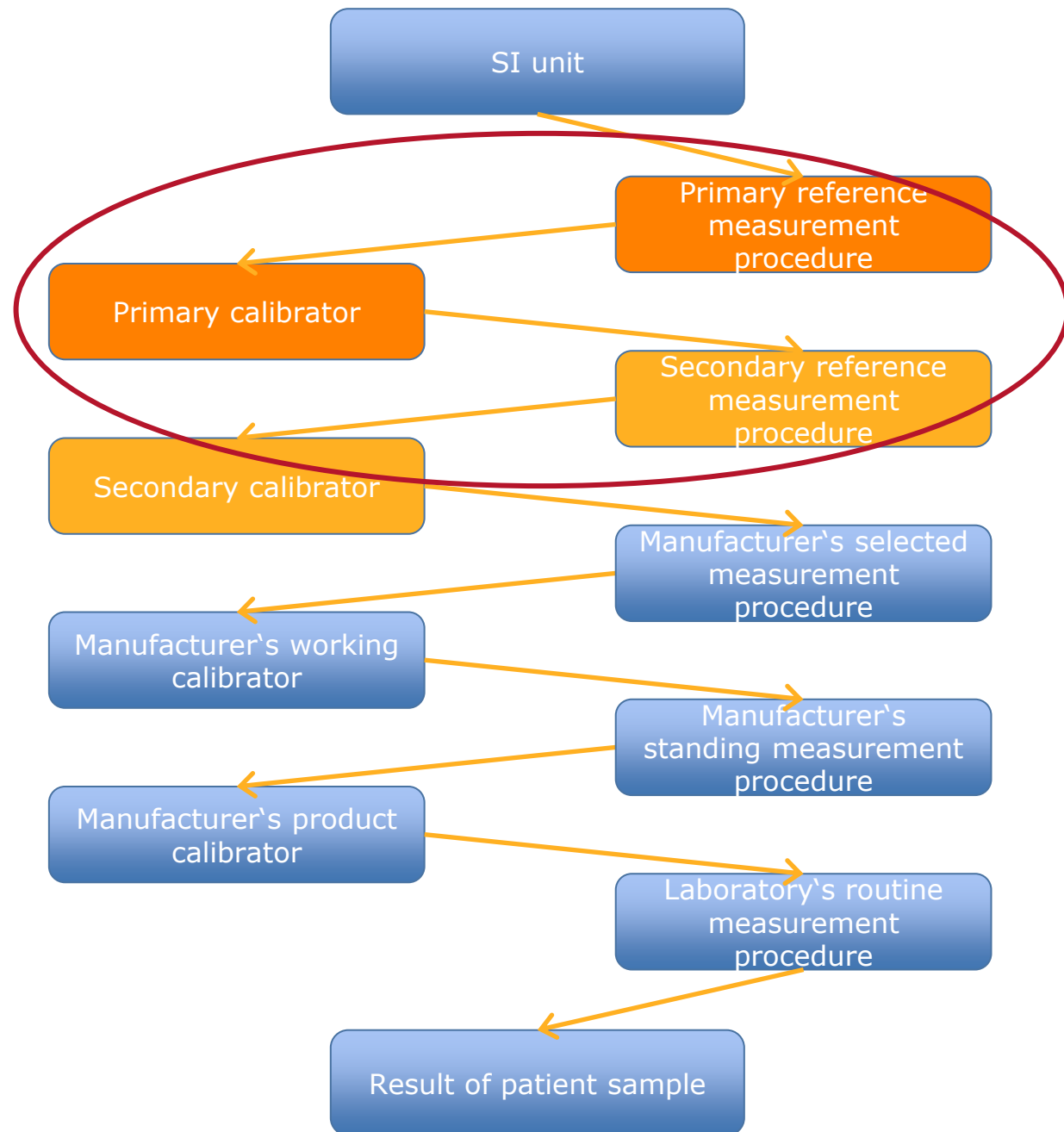
...

The results of the laboratories can be evaluated equally, regardless of the method used.

- Target values assigned by a primary reference measurement procedure

| | | |
|--------------------------|-------------|---------------|
| number of results | 585 | |
| target value | 1.37 | 0.53 |
| limits | 0.89 - 1.85 | 0.344 - 0.716 |
| mean | 1.395 | 0.505 |
| standarddeviation | 0.188 | 0.064 |
| coefficient of variation | 13.478 | 12.677 |

EQA for Calibration Laboratories



An EQA scheme can visualise the link between Calibration/Reference Laboratories in Laboratory Medicine and National Metrology Institutes.

Calibration laboratories can demonstrate their competence.

Results of candidate reference measurement procedures can be compared to established RMP.

Criteria for Listing a Reference Measurement Service

The laboratory has to make use of a reference measurement procedure approved according to **ISO 15193** and reference materials approved according to **ISO 15194**.

The laboratory has to be accredited according to **ISO/IEC 17025** and **ISO 15195**.

The calibration laboratories have to verify their competence through **collaborative surveys** between laboratories working at the highest metrological level.

EQA for Calibration Laboratories - RELA



Home

Welcome

login

Registration/ Account

RELA in progress

order RELA 2017

enter RELA 2017 results

former RELA results

✓ Choose year...

RELA 2003
RELA 2004
RELA 2005
RELA 2006
RELA 2007
RELA 2008
RELA 2009
RELA 2010
RELA 2011
RELA 2012
RELA 2013
RELA 2014
RELA 2015
RELA 2016

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, total glycerol, creatinine, uric acid, urea, glucose, total bilirubin

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-17 β , estriol, 17-OH-progesterone

Thyroid hormones (THYR): total thyroxine (TT4), total tri-iodothyronine (TT3)

Therapeutic drugs (THER): digoxin, digitoxin, theophylline

Vitamins (VITA): 25-OH-vitamin D3

www.dgkl-rfb.de:81

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

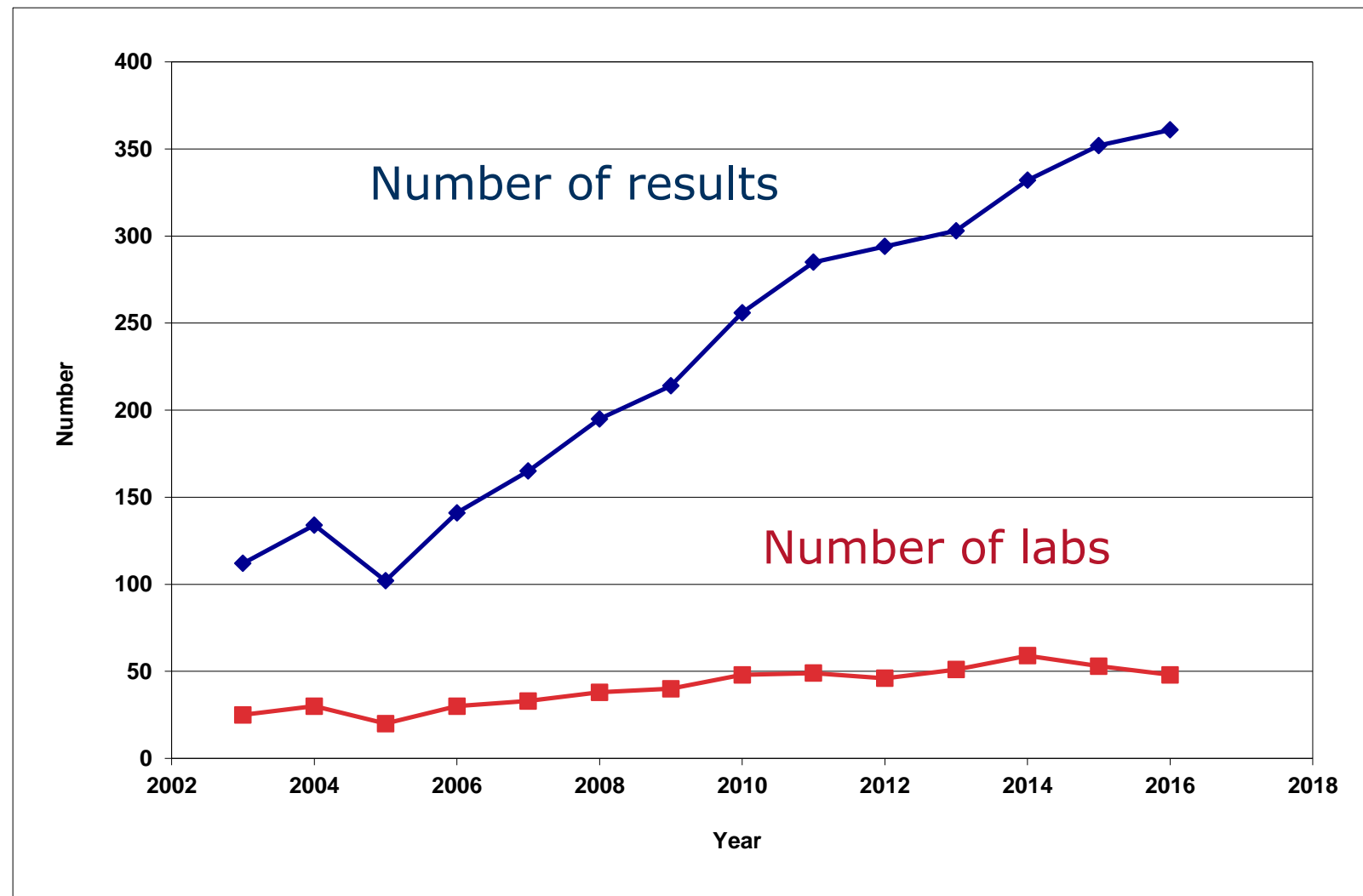
Individual Contracts

RELA – Annual Process



More than 4500 samples are shipped to participating calibration laboratories and candidate reference laboratories.

RELA Statistics



Number of results:

2003 111

2016 361

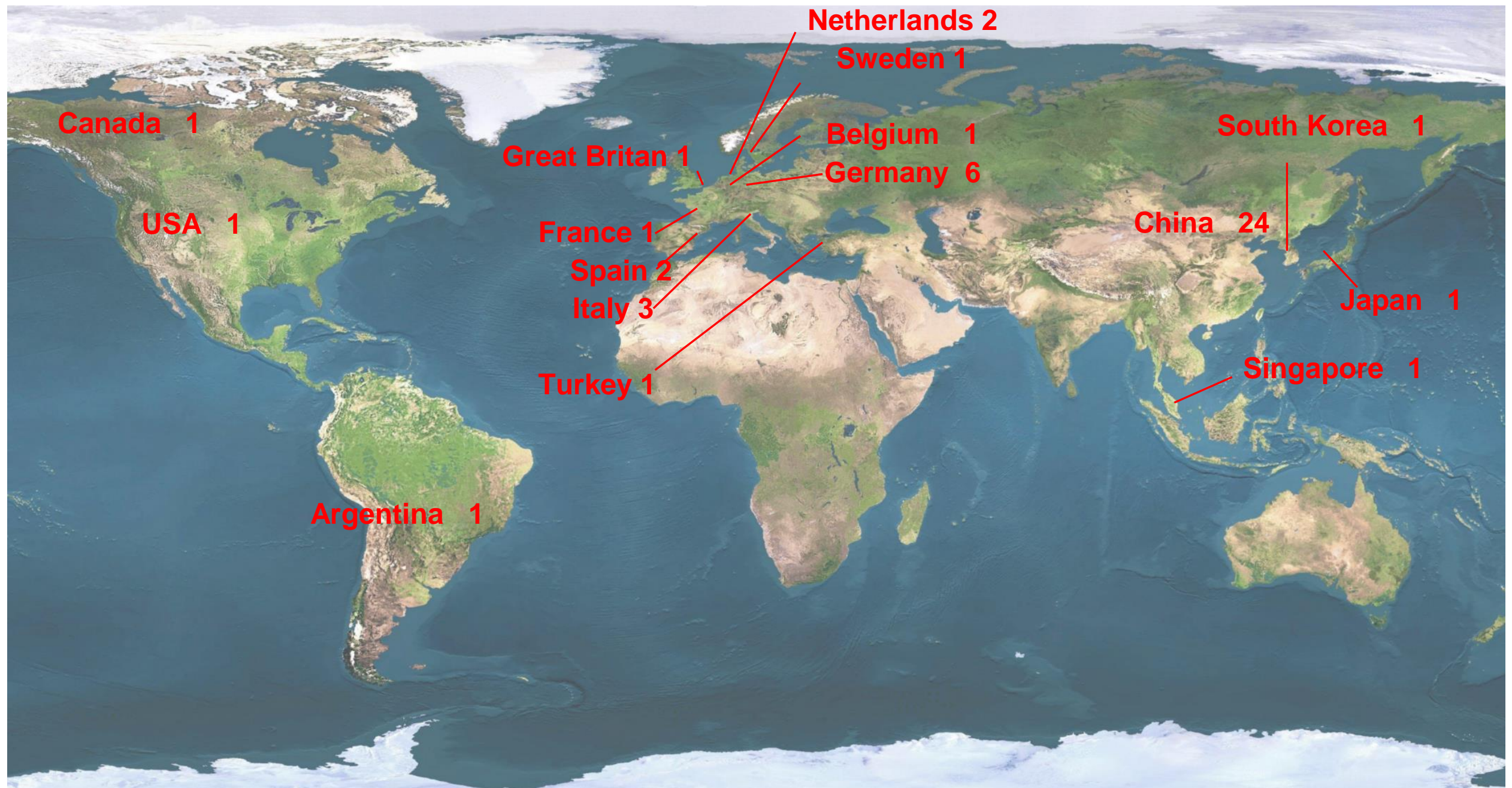
Number of participants:

2003 25

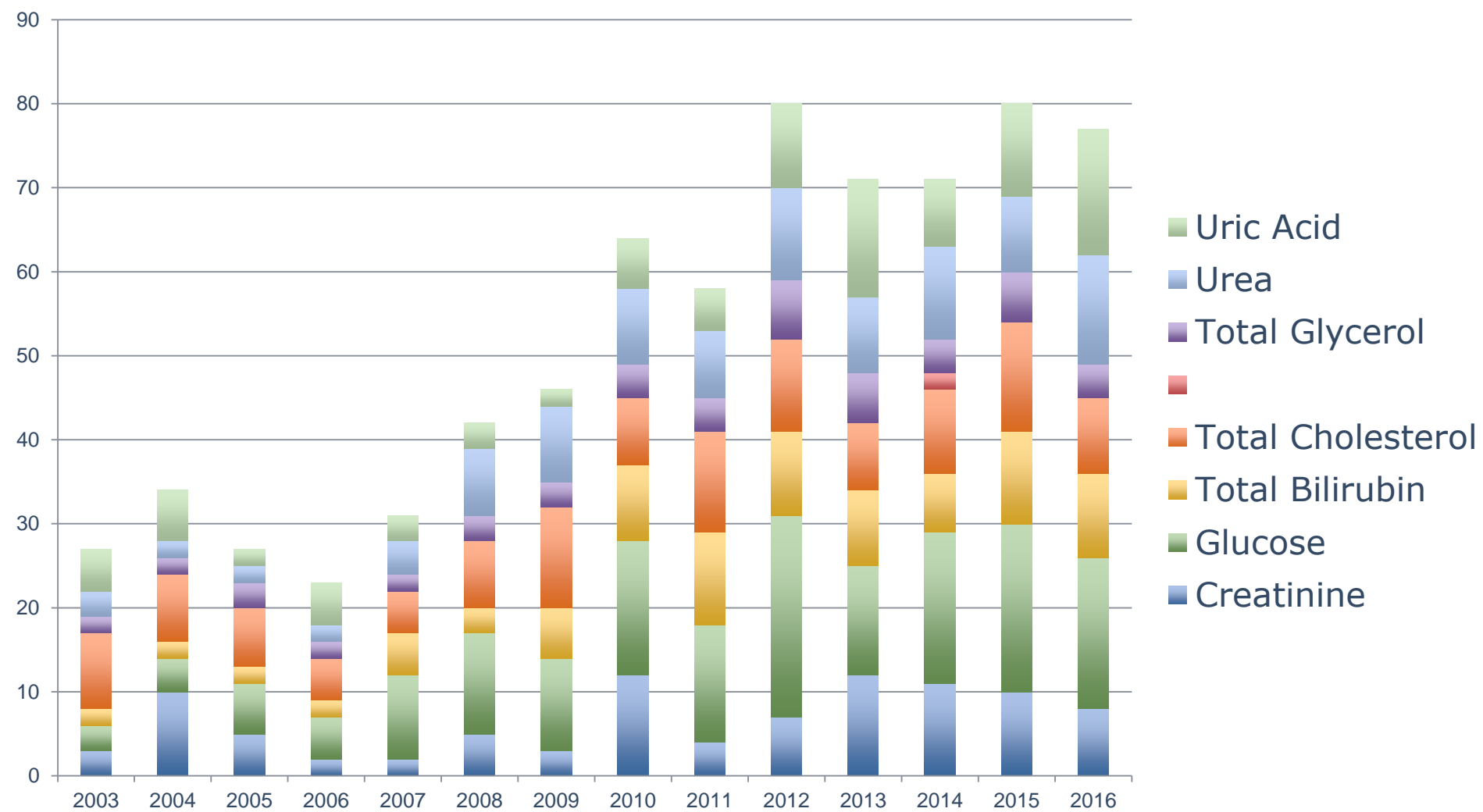
2016 48

17 participants are listed in the JCTLM database.

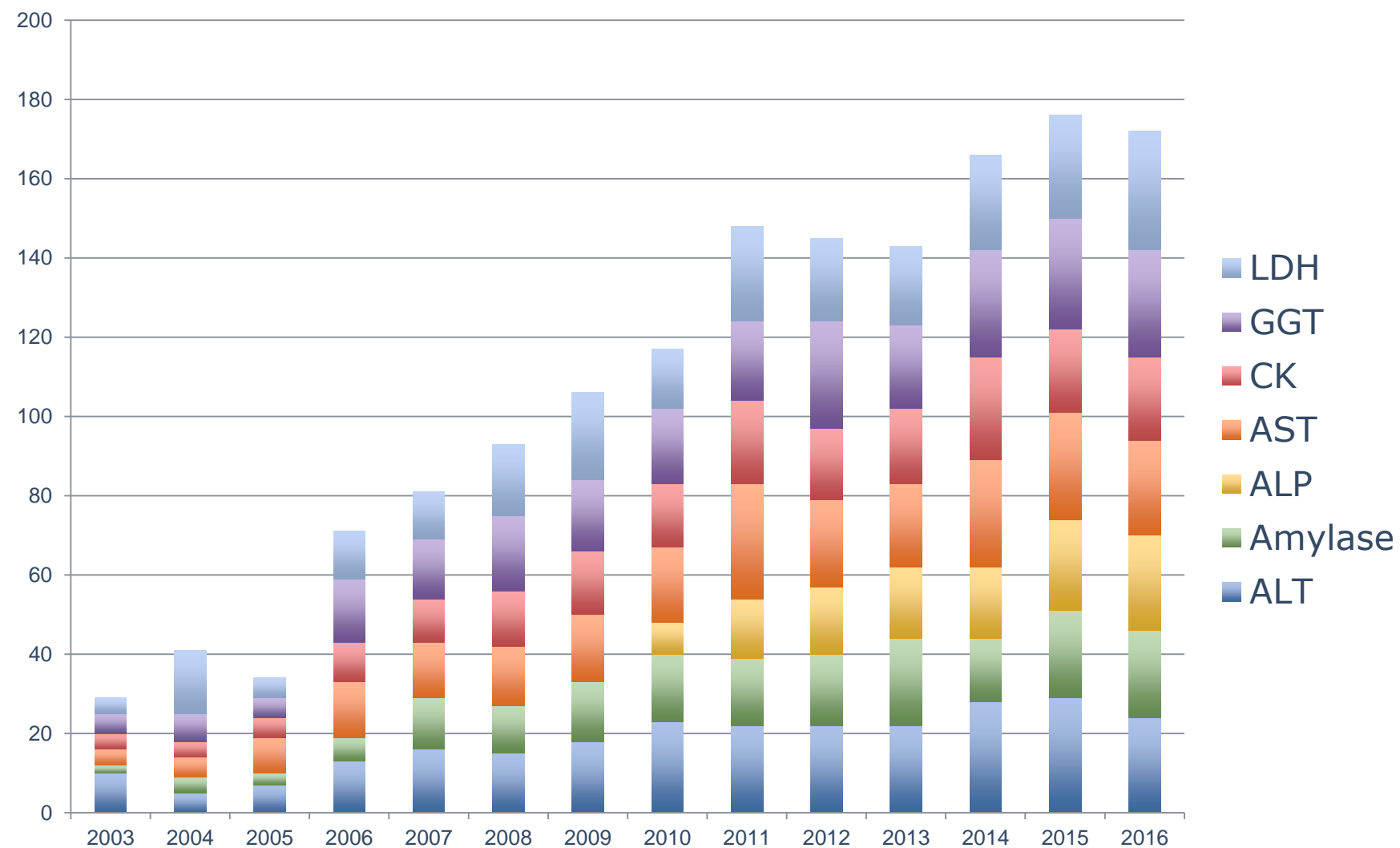
RELA Participants Worldwide



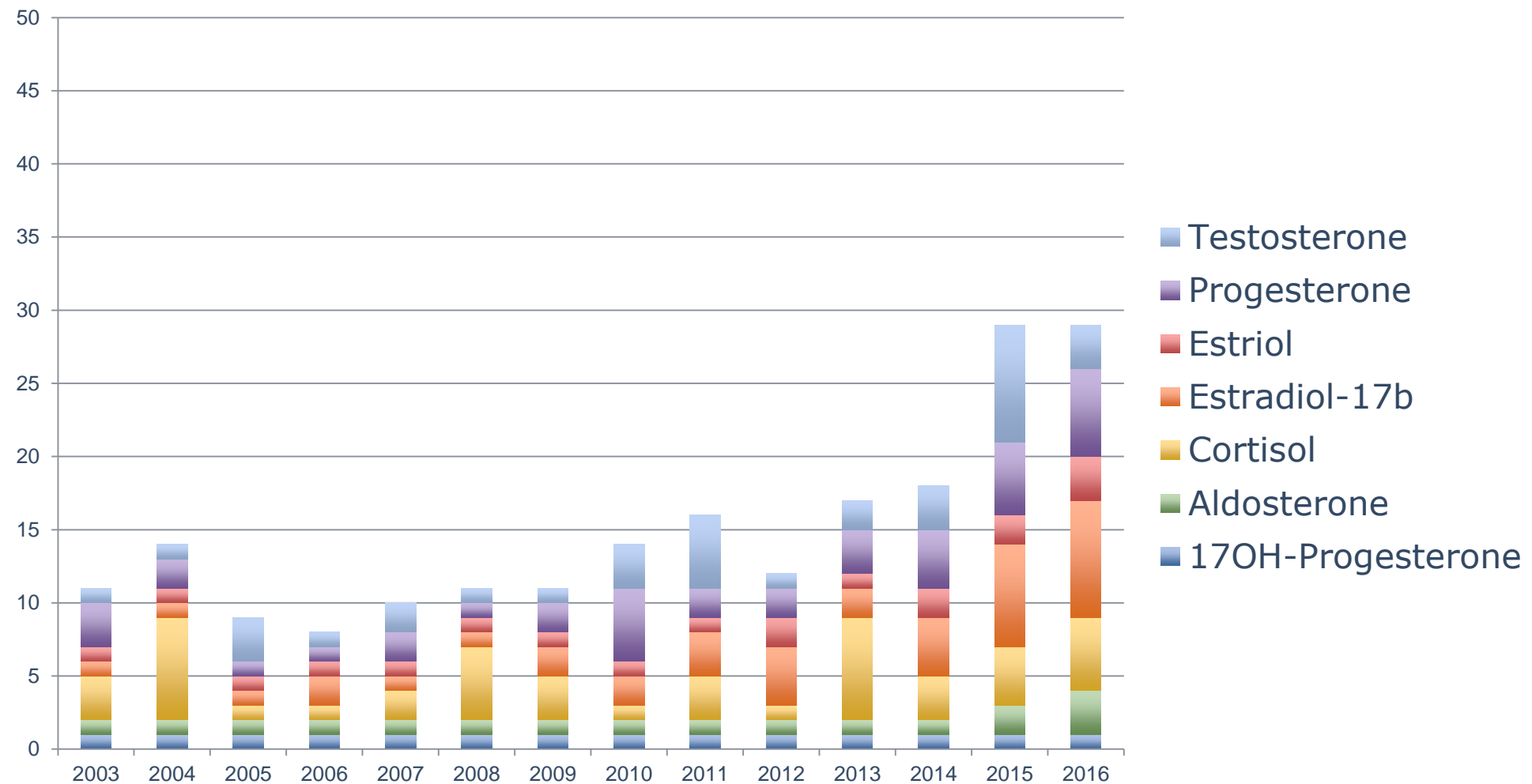
RELA – Metabolites & Substrates



RELA – Enzymes



RELA – Non-peptide Hormones



EQA for Calibration Laboratories - RELA



RELA Home

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order RELA 2016

enter RELA 2016
results

former RELA results

Choose year...

RELA 2015

All or choose Lab ...

select lab analytes

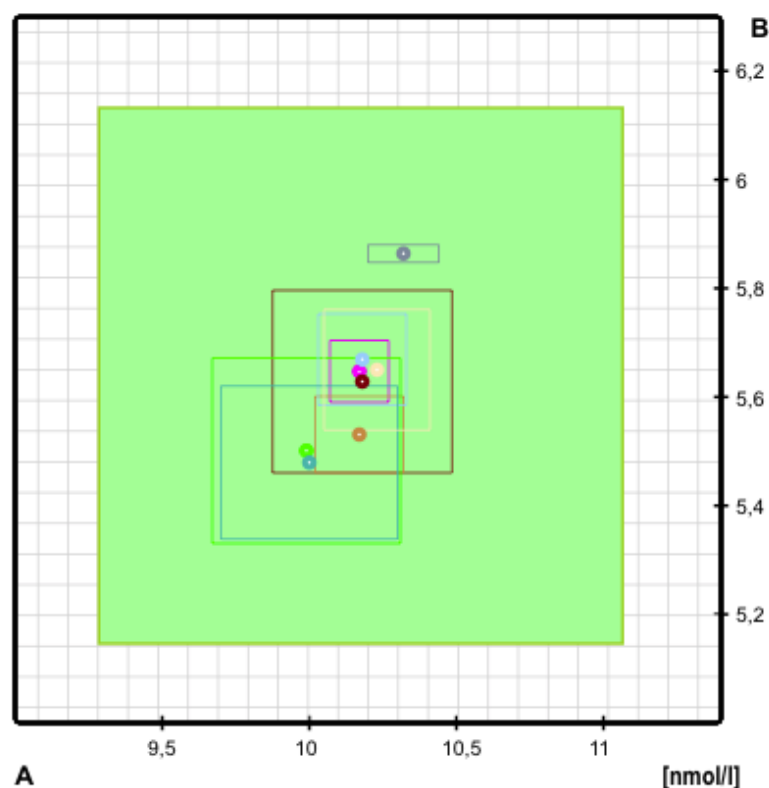
full address

Testosteron

show result plot

☒ with limits of equivalence

Testosteron



For highlighting a specific result please click on the corresponding result line.



Result lines printed in bold indicate JCTLM listed services.

| Labcode | A | e.u. A | B | e.u. B | Method |
|---------|-------|-----------|-------|-----------|-------------|
| 1 | 10,17 | 0,1 | 5,648 | 0,056 | ID/GC/MS |
| 11 | 10,18 | 0,305 | 5,628 | 0,169 | ID/GC/MS |
| 18 | 10,17 | 0,15 | 5,53 | 0,07 | ID/LC/MS/MS |
| 25 | 9,99 | 0,32 | 5,5 | 0,17 | ID/GC/MS |
| 27 | 10,18 | 0,15 | 5,669 | 0,085 | ID/GC/MS |
| 30 | 10 | 0,3 | 5,48 | 0,14 | ID/LC/MS/MS |
| 51 | 10,23 | 0,18 | 5,65 | 0,11 | ID/LC/MS/MS |
| 92 | 10,32 | 0,12 | 5,863 | 0,017 | ID-MS |


grey lines indicate a one-percent grid

e.u. - expanded uncertainty

EQA for Calibration Laboratories - RELA

RELA - Homepage
 External quality control for Reference Laboratories



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[enter RELA 2016 results](#)
former RELA results
[Choose year...](#)

RELA 2015

☒ All or choose Lab ...

- 001 - Referenzinstitut für Bio , Dr. C. Ritter-Sket
- 003 - Medizinische Hochschule , Dr. D. Grote-Koska
- 005 - Roche Diagnostics GmbH , Herrn Gernot Brunny
- 006 - Laboratorio Analisi Chim , CIRME-Prof. Mauro Panteg
- 008 - Physikalisch-Technische , Dr. Henrion, Dr. Rienitz
- 011 - Ref4U, Laboratory of Tox , Dr. Katleen Van Uytfangh
- 012 - Fundacion Bioquimica Arg , Raul Girardi
- 016 - Servizio di Medicina di , Ferruccio Ceriotti
- 018 - National Center for Clin , Prof. Wenxiang Chen
- 019 - Reference Material Insti , Masao Umemoto, Ph. D
- 023 - BioSystems, S.A. , Prof. D. Gella
- 024 - Children' Hospital of Wi , Stanley F. Lo, Ph.D., DA
- 025 - Deputy Director , Dr. David Ducroq
- 027 - Instand e. V. , Dr. Patricia Kaiser
- 030 - Centers for Disease Cont , Julianne Cook Botelho, P
- 038 - Haga Hospital/ Lab West , Dr. P. Franck
- 039 - Canadian EQA Laboratory , David W. Secombe, MD, P
- 041 - Roche Diagnostics GmbH , Rolf Nagel
- 043 - Dept. Science and Biomed , CIRME-Prof. Andrea Mosca
- 046 - Clinical Enzymology Refe , Francesca Canalias
- 047 - Beijing Aerospace Genera , Chen Baorong
- 048 - Biosino Bio-Technology a , Jiang lin
- 051 - Sichuan Maccura Biotechn , Lu Lei
- 052 - Queen Beatrix Hospital , Cas Weykamp
- 054 - Shanghai Center for Clin , Ju Yi
- 055 - Reference Laboratory , Chi Shan
- 061 - Mindray Standardization , Wang Yingguo
- 063 - Beijing Leadman Biochemi , Dr. Ma Zhiyuan
- 065 - Clinical Laboratory of , Prof. Xianzhang Huang
- 073 - Department of clinical I , Runqing Mu
- 074 - Center of Laboratory Med , Dr. Huimin Wang
- 075 - 3V Reference Laboratory , Wang Zejia
- 077 - Department of Laboratory , Rui Zhang

☐ with limits of equivalence

For highlighting a specific result please click on the corresponding result line.
 Result lines printed in bold indicate JCTLM listed services.

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| 92 | 10,32 | 0,12 | 5,863 | 0,017 | ID-MS |

e.u. - expanded uncertainty

RELA Results

- Example Glucose -

RELA 2016

All or choose Lab ...

select lab analytes

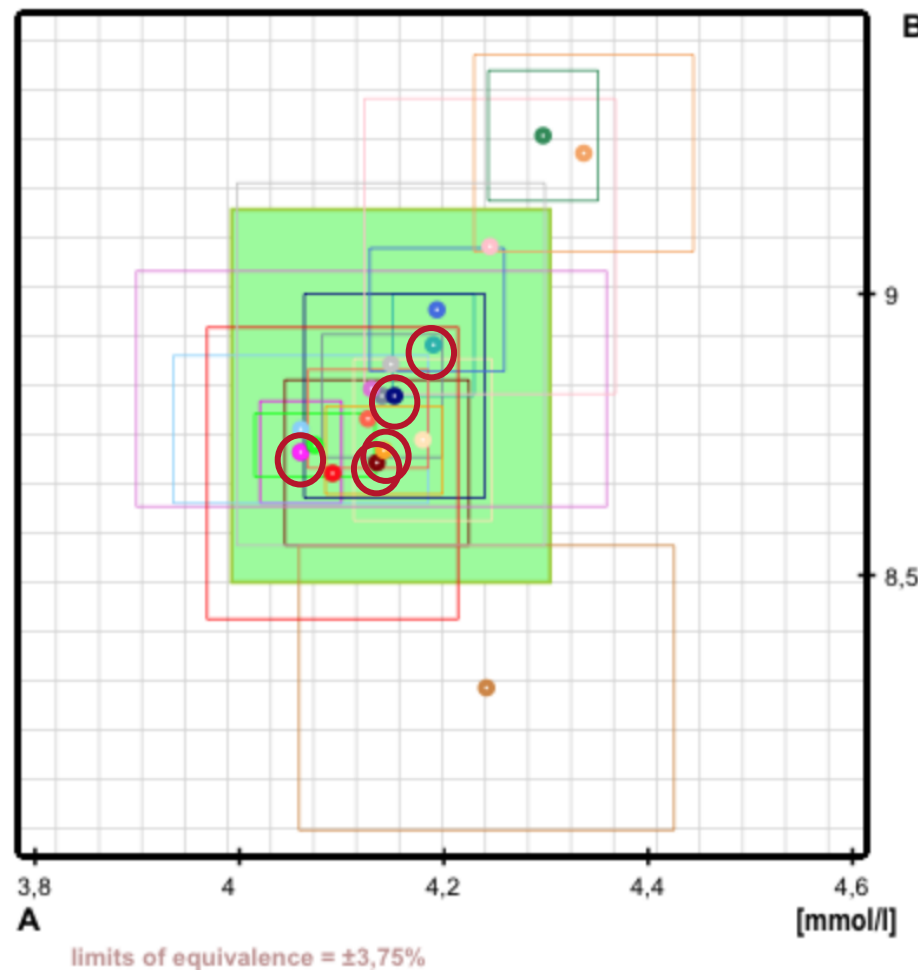
full address

Glucose

show result plot

☒ with limits of equivalence

Glucose



For highlighting a specific result please click on the corresponding result line.

Result lines printed in bold indicate JCTLM listed services.

| Labcode | A | e.u. A | B | e.u. B | Method |
|---------|-------|-----------|-------|-----------|-------------------|
| 3 | 4.06 | 0.04 | 8.72 | 0.09 | ID/GC/MS |
| 5 | 4.135 | 0.09 | 8.7 | 0.148 | ID/GC/MS |
| 12 | 4.074 | 0.059 | 8.731 | 0.057 | spectrophotometry |
| 24 | 4.06 | 0.125 | 8.76 | 0.132 | spectrophotometry |
| 27 | 4.19 | 0.04 | 8.91 | 0.09 | ID/GC/MS |
| 39 | 4.18 | 0.068 | 8.74 | 0.144 | spectrophotometry |
| 54 | 4.14 | 0.058 | 8.82 | 0.11 | ID/GC/MS |
| 61 | 4.151 | 0.088 | 8.82 | 0.182 | spectrophotometry |
| 65 | 4.141 | 0.057 | 8.721 | 0.077 | spectrophotometry |
| 87 | 4.13 | 0.23 | 8.83 | 0.21 | spectrophotometry |
| 119 | 4.246 | 0.123 | 9.085 | 0.263 | spectrophotometry |
| 122 | 4.126 | 0.058 | 8.778 | 0.089 | spectrophotometry |
| 124 | 4.193 | 0.065 | 8.973 | 0.109 | spectrophotometry |
| 132 | 4.09 | 0.123 | 8.68 | 0.26 | spectrophotometry |
| 145 | 4.148 | 0.15 | 8.876 | 0.322 | spectrophotometry |

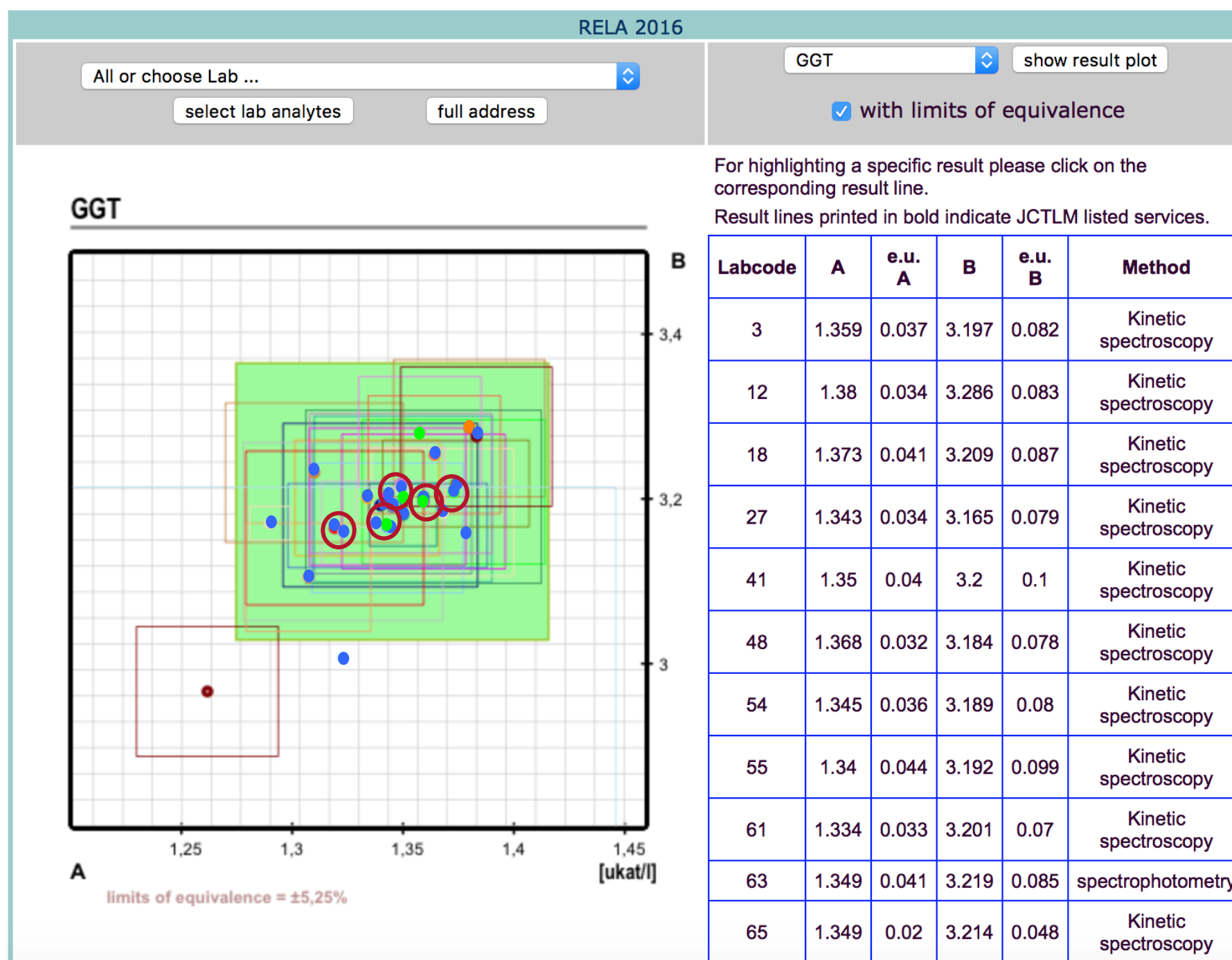
○ 5 of 9 JCTLM listed services

grey lines indicate a one-percent grid

e.u. - expanded uncertainty

RELA Results – Regional Distribution

- Example GGT -



Participants from

● South America

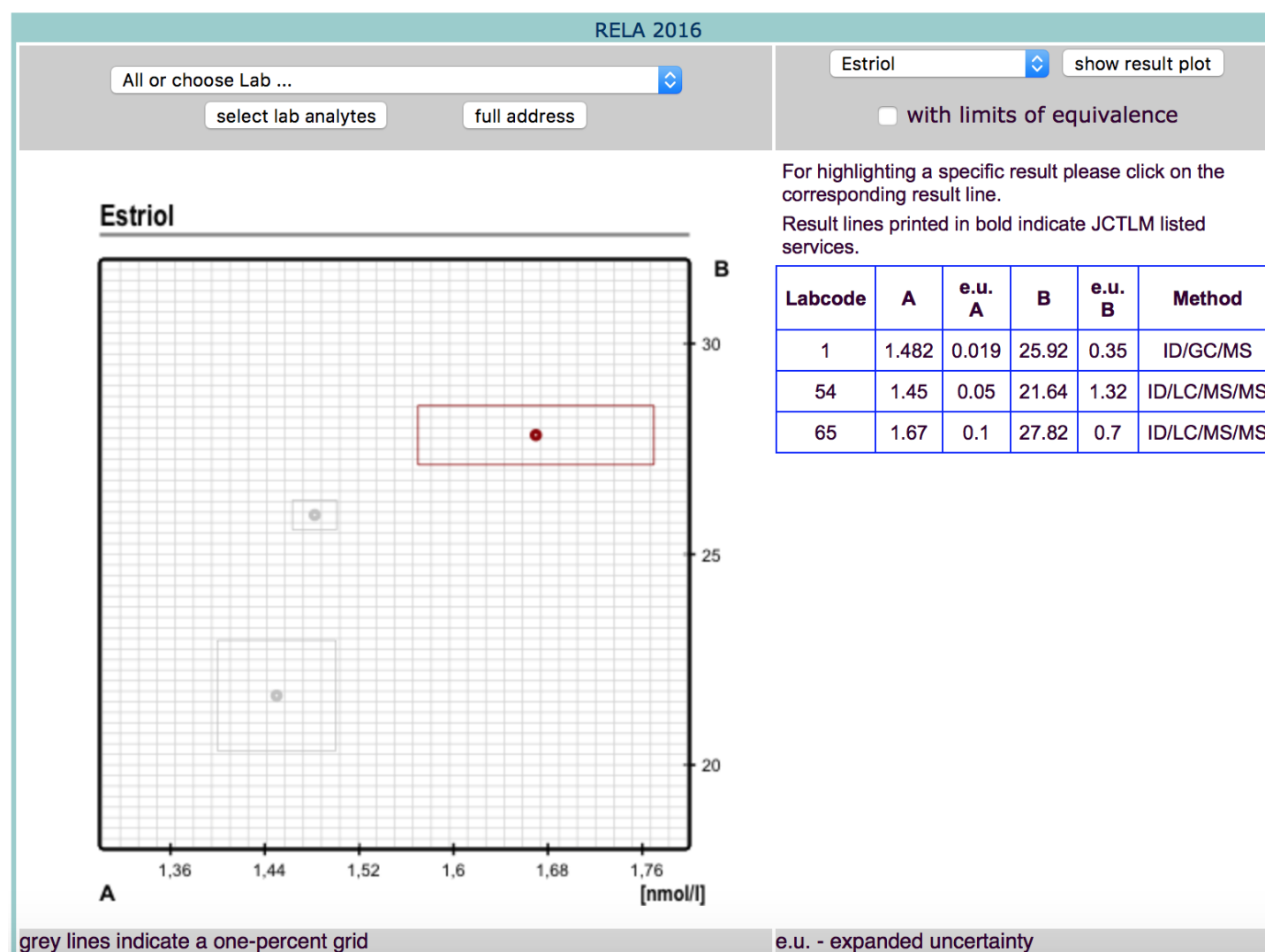
● Europe

● Asia

○ 5 of 9 JCTLM listed services

RELA Results with less participants

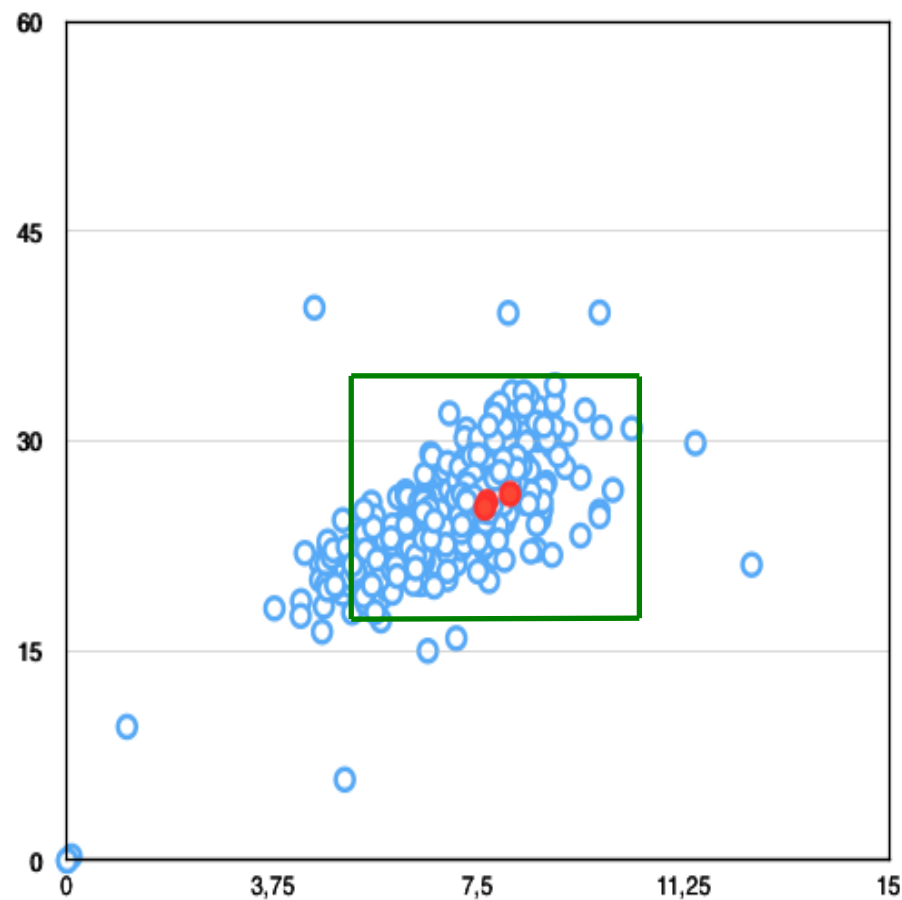
- Example Estriol -



Results of Routine and Calibration Laboratories

Testosterone

HM 1/16 vs. RELA2014



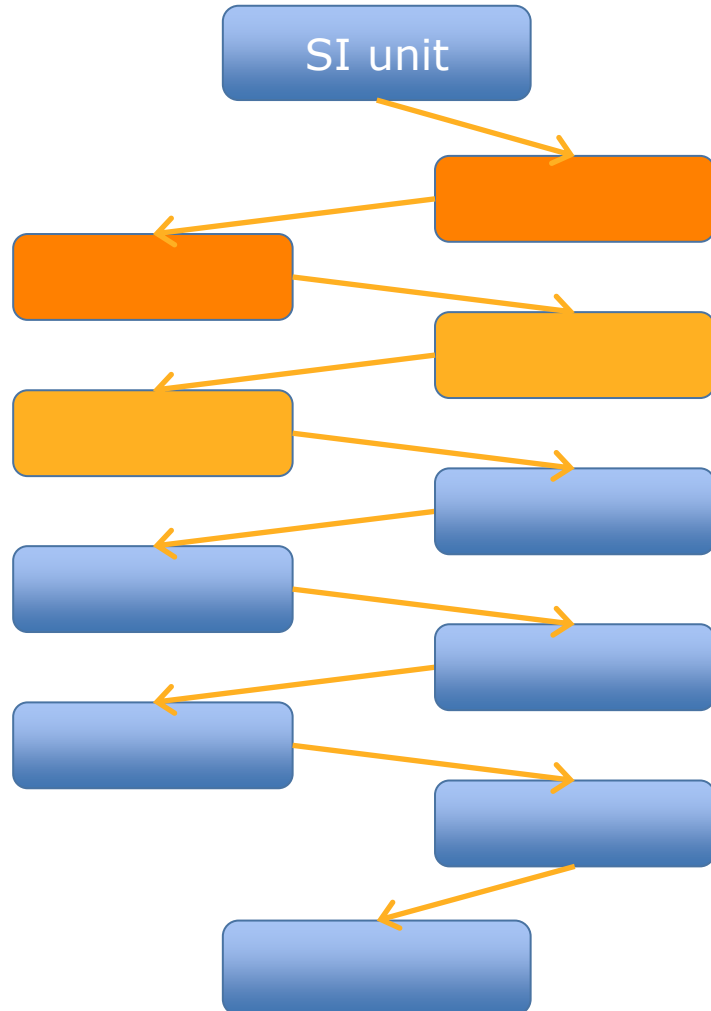
- 680 routine labs
- Limits of Acceptance: 35%
- 3 calibration labs

RELA – To all whom it may concern

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.

Summary and Outlook



RELA is an EQA scheme for calibration laboratories which supports them to demonstrate their competence. All results are published and the website is of open access.

Scientific work is necessary to develop reference measurement systems for further measurands in laboratory medicine.

In parallel, the portfolio of RELA should be extended to support this process.

In addition, it has to be discussed how the data can be used to make a statement about the quality of the calibration laboratories.

