Dear colleagues,

Welcome to the 1. cycle of external quality assessment in 2015 by Croatian Centre for Quality Assessment in Laboratory Medicine, within Croatian Society of Medical Biochemistry and Laboratory Medicine. Quality assessment is conducted completely through network interface unit, for the following areas in laboratory medicine:

<table>
<thead>
<tr>
<th>Module</th>
<th>Name of the module</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>BIOCHEMISTRY PARAMETERS</td>
</tr>
<tr>
<td>II</td>
<td>SPECIFIC PROTEINS, CRP</td>
</tr>
<tr>
<td>III</td>
<td>LABORATORY HEMATOLOGY</td>
</tr>
<tr>
<td>IV</td>
<td>LABORATORY COAGULATION</td>
</tr>
<tr>
<td>VI</td>
<td>URINALYSIS (URINE TEST STRIP, SEDIMENT)</td>
</tr>
<tr>
<td>VII</td>
<td>ANALYSIS OF pH, BLOOD GASES AND ELECTROLYTES</td>
</tr>
<tr>
<td>VIIa</td>
<td>POC - ANALYSIS OF pH, BLOOD GASES, ELECTROLYTES, GLUCOSE AND LACTATE</td>
</tr>
<tr>
<td>VIII</td>
<td>HORMONES, VITAMINS, DRUGS, TUMOR MARKERS</td>
</tr>
<tr>
<td>IX</td>
<td>HbA1c</td>
</tr>
<tr>
<td>X</td>
<td>PREANALYTICAL PHASE OF LABORATORY TESTING</td>
</tr>
<tr>
<td>XI</td>
<td>POSTANALYTICAL PHASE OF LABORATORY TESTING</td>
</tr>
<tr>
<td>XII</td>
<td>SWEAT CHLORIDE TEST</td>
</tr>
</tbody>
</table>

Dynamics of cycle:

CYCLE 1/2015: 11th May 2015 DISTRIBUTION OF SAMPLES
until 26th May 2015 RESULTS ENTRY
until 26th July 2015 ANALYSED RESULTS ARE AVAILABLE
On-line input of your results is possible via web site: [https://www.croqalm.com](https://www.croqalm.com).

We suggest that you download the certificate of your loading operator, to avoid messages about insecure network address. In case the message appears, your further work will not be disturbed.

Instructions on installing the certificate can be found in the manual (3rd Access and use of inlab2-QALM interface.pdf), which is available after you sign in on CROQALM web page.

Within the inlab2*QALM programme of quality assessment in laboratory medicine enter your Username and password.

For inspection and printing of results submitted through network interface unit, use the key PRINT OF SUBMITTED RESULTS.

### IMPORTANT NOTIFICATION:
Informatics coordinator for this cycle is Ana Grzunov who can be contacted through e-mail address: croqalm@gmail.com.

You can refer all questions concerning administration and accounts to Jasna Đogić, administrative secretary of Society, through the e-mail address: hdmblm@hdmblm.hr.

### INSTRUCTIONS FOR SAMPLE PREPARATION:

**Samples for module I, II, III, IV, VI, VII and IX are of human origin, so they must be treated as any unknown laboratory sample.**

<table>
<thead>
<tr>
<th></th>
<th>BIOCHEMISTRY PARAMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tests:</strong></td>
<td>Glucose, Total bilirubin, Direct bilirubin, Creatinine, Urea, Uric acid, Sodium, Potassium, Total calcium, Inorganic phosphate, Chloride, Iron, Total iron binding capacity (TIBC), Unsaturated iron binding capacity (UIBC), Copper, Cholesterol, HDL-cholesterol, LDL-cholesterol, Triglycerides, Alanine aminotransferase (ALT), Aspartate aminotransferase (AST), Gamma glutamyltransferase (GGT), Alkaline phosphatase (ALP), Creatin kinase (CK), Lactate dehydrogenase (LDH), Alpha amylase (AMS), Total protein, Albumin, Cholinesterase, Total magnesium, Lactate, Lipase (LPS).</td>
</tr>
</tbody>
</table>

**Sample type:** Lyophilised human origin control sample

**Storage:** 2-8°C

**Preparation:** Dissolve lyophilised serum sample in 5.0 mL of destilled or deionised water, close and leave at room temperature at least 30 minutes with occasionally mixing. Before the analysis, gently stir the sample several times with circular movements in order to ensure homogeneity of the sample.

**Stability:** Dissolved sample is stable for 7 days on 2-8°C and one month on -20°C if dissolved sample was aliquoted and frozen within 30 minutes.
### II SPECIFIC PROTEINS

**Tests:** α-1-antitrypsin, β-2-microglobulin, Ceruloplasmin, Complement-component C3, Complement-component C4, C-reactive protein (CRP), Haptoglobin, Immunoglobuline A (IgA), Immunoglobuline E (IgE), Immunoglobuline G (IgG), Immunoglobuline M (IgM), Transferrin

**Sample type:** Lyophilised human origin control sample

**Storage:** 2-8°C

**Preparation:** Dissolve lyophilised serum sample in 1.0 mL of destilled or deionised water, close and leave at room temperature at least 30 minutes with occasionally mixing. Before the analysis, gently stir the sample several times with circular movements in order to ensure homogeneity of the sample. Inverse, vigorous mixing is not allowed.

**Stability:** Dissolved sample is stable for 7 days on 2-8°C and one month on -20°C if dissolved sample was aliquoted and frozen within 30 minutes.

### III LABORATORY HEMATOLOGY

**Tests:** Leukocytes (Lkc), Erythrocytes (Erc), Hemoglobin (Hb), Hematocrit (Htc), Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH), Mean Corpuscular Hemoglobin Concentration (MCHC), Thrombocytes (Trc), Mean Platelet Volume (MPV),

Samples are labeled like: Module 3A, 3B, 3C. Please be careful and follow this mark when enter your results.

**Note:** It is recommended to analyze the samples immediately upon receipt of and in accordance with the manufacturer's instructions of analyzer for analysis of the control material.

The parameters of the differential blood count: Neutrophil granulocytes (%), Lymphocites (%), Monocytes (%), Eosinophilic granulocytes (%), Basophilic granulocytes (%), MID (monocytes, Eosinophilic Granulocytes, Basophilic Granulocytes) and Reticulocytes (analyzer/manual) are not a mandatory part of the program. Your results will help us to finding the most optimal hematological sample for this module.

**Sample type:** Whole blood, human origin, 3x4 ml, different concentration areas

**Storage:** 2-8°C

**Preparation:** Before analyzing the sample is necessary to leave at room temperature for at least 15 minutes, then do a quick 1x inversion of the tube, and just before determining the hematology analyzer, mix carefully and thoroughly by inversion of the tube 8-10 times.

**Stability:** Once opened, sample is stable for 7 days on 2-8°C. Sample cannot be frozen.

### IV LABORATORY COAGULATION

**Tests:** Prothrombin Time - activity percentage (PV- activity percentage), Prothrombin Time-INR (PV-INR), Activated Partial Thromboplastin Time (APTV), Activated Partial Thromboplastin Time -ratio (APTV-ratio), Fibrinogen, Antithrombin-activity, D-dimer.
Sample type: Lyophilised, human plasma

Storage: 2-8°C

Preparation: Dissolve lyophilised serum sample in 1.0 mL of destilled or deionised water, whose temperature is 15-25 ºC, close and leave at room temperature at least 30 minutes with occasionally mixing. Before the analysis, gently stir the sample several times with circular movements in order to ensure homogeneity of the sample. It is not allowed strong inverse mixing.

Stability: Dissolved sample is stable for maximum 1 day on 2-8°C. The Prothrombin Time is recommended to analyse immediately upon the sample dissolved and stabilized.

---

VI  URINALYSIS (URINE TEST STRIP, SEDIMENT)


Sample type: Human urine sample, liquid, 12 ml

Storage: 2-8 ºC

Preparation: Sample is ready to use when reaches room temperature (18-25ºC) with occasionally inverse mixing in order to ensure homogeneity of the sample. After that, the sample is treated like any other sample of urine.

Stability: Once open sample is stable for 30 days on 2-25 ºC. Sample cannot be frozen.

Operating intake results:
Please enter your results for the following analysis in this Module by using a drop-down sequence of answers.

---

VII  ANALYSIS OF pH, BLOOD GASES AND ELECTROLYTES

Tests: Partial pressure of oxygen (pO2), Partial pressure of carbon dioxide (pCO2), pH, Ionized calcium, Ionized potassium, Ionized sodium, Ionized chloride

Sample type: Buffered salt solution in human matrix

Storage: 2-8 ºC

Preparation: Before determining the sample shall be thoroughly mixed for 10 seconds to balance gas concentrations in the aqueous phase. The sample for pH and blood gases must be analyzed immediately after opening the ampoule or within 60 seconds.

Analysis of the control sample compulsorily carried in accordance with the manufacturer's instructions of analyzer for analysis of the control material.

---

VIIa  POC- ANALYSIS OF pH, BLOOD GASES, ELECTROLYTES, GLUCOSE AND LACTATE
**Tests:** Partial pressure of oxygen (pO\(_2\)), Partial pressure of carbon dioxide (pCO\(_2\)), pH, Ionized calcium, Ionized potassium, Ionized sodium, Ionized chloride, glucose, lactate

**Sample type:** Buffered water solution

**Storage:** 2-25 °C

**Preparation:** The temperature of the sample for the determination of the 20-23 ° C. Before determining the required sample stir 15-20 times to balance gas concentrations in the aqueous phase. The sample for pH and blood gases should be analyzed immediately after opening the ampoule or within 60 minutes if used for the determination of ionized electrolyte.

The control sample is a buffered water solution, and the analysis carried out according to the instructions of the manufacturer’s instructions of analyzer for analysis of the control material.

---

**VIII**

**HORMOES, DRUGS, VITAMINS, TUMOR MARKERS**

**Tests:** Triiodothyronine, total (T3), Thyroxine, total (T4), Thyreotropin (TSH), Thyroxine, free (FT4), Triiodothyronine, free (FT3), Estradiol, Dehydroepiandrosterone-sulfate (DHEA-S), Follicle stimulating hormone (FSH), Lutelining hormone (LH), Progesterone, Prolactin (PRL), Sex hormone-binding globulin (SHBG), Testosterone, total, Adrenocorticotropic hormone (ACTH), Cortisol, Chorionic gonadotropin (HCG), Thyroglobulin (Tg), Parathyroid hormone (PTH), Insulin, C-peptide, Digoxin, Phenobarbitone, Valproate, Carbamazepine, Folic acid (folate), Vitamin B12 (cobalamine), CA 15-3, CA 125, Alpha-fetoprotein (AFP), CEA, CA 19-9, PSA, total, PSA, free (fPSA), Ferritin

**Sample type:** Lyophilised sample of human origin

**Storage:** 2-8 °C

**Preparation:** Dissolve lyophilised serum sample in 5.0 mL of destilled or deionised water whose temperature is 15-25°C, close and leave at room temperature at least 30 minutes with occasionally mixing. Before the analysis, gently stir the sample several times with circular movements in order to ensure homogeneity of the sample. Inverse, vigorous mixing is not allowed.

**Stability:** Dissolved sample is stable for 7 days on 2-8°C and 30 days on –10 to -20°C. Once dissolved, the frozen sample cannot be frozen again.

C-Peptide is stabile for 1 day, stored on 2-8°C.

Parathyroid hormon (PTH), Thyrogblobulin (Tg) must be determined within 4 hours if kept after thawing at 2-8 ° C or 2 weeks on -20 °C.

Adrenokortikotropi hormon (ACTH) must be determined within 4 hours if kept after thawing at 2-8 ° C. The stability of the frozen sample of ACTH and C-peptide is not determined.

It is not allowed, after using the sample to put it back in the original bottle.

---

**IX**

**HbA1c**

**Tests:** Hemoglobin A1c

**Sample type:** Lyophilised sample of human origin

**Storage:** 2-8 °C
**Preparation:** Dissolve lyophilised serum sample in 0.5 mL of distilled or deionised water, close and leave at room temperature at least 10 minutes with occasionally mixing. Before the analysis, gently stir the sample several times with circular movements in order to ensure homogeneity of the sample. Inverse, vigorous mixing is not allowed. Manufacturer recommends, but not requests double deionized water.

**Stability:** Dissolved sample is stable for 7 days on 2-8°C.

### PREANALYTICAL PHASE OF LABORATORY TESTING

Please for each described case choose one of the answers that are in descending order; you're your answer in cases of 12-16 is "other", please fill in left empty space ("user information") the name of the manufacturer.

This module is educational. Results will be presented in bulk and are not included in the final report marks of the laboratory.

### POSTANALYTICAL PHASE OF LABORATORY TESTING

Please for each described case (2 cases) choose one of the answers that are in descending order and to your opinion and knowledge are best suited for laboratory practice.

This module is educational. Results will be presented in bulk and are not included in the final report marks of the laboratory.

**SWEAT CHLORIDE TEST**

**Tests:** Sweat chloride test

**Sample type:** NaCl solution ("in-house" control material)

**Storage:** 2-8 °C

**Preparation:** The sample is ready for analysis when reach room temperature (18-25°C) with occasional inversely mixing to achieve homogeneity of the sample. On the pre-weighed filter paper (gauze), pipette 100 uL of sample and continue handle as the sample of patients.

**Stability:** Sample is stable for 3 months on 2-8°C.

**Note:** The sample was primarily designed for determining chloride test with mercurimetric titration method. Other procedures / methods please specify in the space intended for user notes.

Kind regards,

CROQALM