ERNDIM
Qualitative Organic acids Urine
Barcelona ANNUAL REPORT
2020

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1. Introduction

The ERNDIM Qualitative Organic Acids in urine scheme offers urine samples obtained from confirmed patients with confirmed diagnoses to enable laboratories to gain or maintain experience to identify organic acid disorders. The scheme is organised by Judit Garcia Barcelona Scheme in conjunction with CSCQ, the Swiss organisation for quality assurance in medical laboratories.

As in previous years, samples were sent out to cover the spectrum of what is typically observed in the metabolic laboratory. A mix of clearly diagnostic profiles and some more challenging profiles were provided. As in previous years normal profiles were also sent out. The requirement to interpret a normal profile, as such, is as important as correctly identifying abnormal profiles. Correctly identifying a profile as normal can avoid unnecessary further investigation and distress to the patient and family.

2. Participants

In 2020 seventy five laboratories from many different countries participated in the QLOU *Barcelona* scheme. One laboratory was educational participants in 2020 (2 in 2019). They take part in all aspects of the scheme and receive interim reports with scores, but performance is not indicated on the ERNDIM certificate of performance.

Participants and new applicants will distributed between the Barcelona, Heidelberg and Sheffield qualitative urinary organic acid schemes which are run separately. The three organising laboratories each participate in the other's scheme by rotation.

Table 1: Geographical distribution of participants

Country	*Number of laboratories*		*Country*	*Number of laboratories*
ARGENTINA	4		ITALY	14
BRAZIL	2		KINGDOM OF SAUDIA ARABIA	1
CHILE	1		LEBANON	1
CHINA	2		PHILIPPINES	1
COLOMBIA	1		PORTUGAL	2
CYPRUS	1		QATAR	1
FRANCE	21		REPUBLIC OF SINGAPORE	1
GERMANY	1		SPAIN	10

[1] If these scheme instructions are not Version 1 for this scheme year, go to APPENDIX 1 for details of the changes made since the last version of this document

Table 1: Geographical distribution of participants				
Country	*Number of laboratories*		*Country*	*Number of laboratories*
GREECE	1		UK	1
HONG KONG	4		URUGUAY	1
INDIA	4			

3. Design of the scheme and logistics

As usual, the samples used in 2020 were authentic human urine samples, 6 from affected patients and 3 from healthy individuals.
All samples selected by the Scientific Advisor have been heat-treated and were tested for suitability in the Scientific Advisor's laboratory.
In 2020 CSCQ dispatched the QLOU EQA samples to the scheme participants and provides a website for on-line submission of results and access to scheme reports. Existing QLOU, ACDB, DPT and Urine MPS scheme participants can log on to the CSCQ results submission website at: https://cscq.hcuge.ch/cscq/ERNDIM/Initial/Initial.php
Labelled copies of chromatograms can be uploaded on the CSCQ website.

4. Schedule of the scheme

Table 2: Time schedule in the 2020 ERNDIM QLOU *Barcelona* scheme.

	1st Submission Round	**2nd Submission Round**	**3rd Submission Round**
Sample ID's:	QLOU-EB-2020-A QLOU-EB-2020-B QLOU-EB-2020-C	QLOU-EB-2020-D QLOU-EB-2020-E QLOU-EB-2020-F	QLOU-EB-2020-G QLOU-EB-2020-H QLOU-EB-2020-I
Shipment of samples	February 11th, 2020		
Start of analysis (clinical data available)	May 11th, 2020	July 6th, 2020	September 7th, 2020
Reminder for result submission	May 25th, 2020	July 20th, 2020	September 21th, 2020
Results submission deadline:	June 1st, 2020	July 27th, 2020	September 28th, 2020
Interim reports available on CSCQ website	*September 2020*	*December 2020*	*December 2020*

To be able to continue this scheme we need a steady supply of new patient samples. Several laboratories have donated samples to the Urine QLOU scheme in the past, for which they are gratefully acknowledged. If you have one or more samples available and are willing to donate these to the scheme, please contact us at admin@erndim.org.
Laboratories which donate samples that are used in the scheme are eligible for a 20% discount on their participation in the QLOU scheme in the following year.

Table 3: Samples included in the 2020 ERNDIM QLOU *Barcelona* scheme.

Survey	Sample no.	Diagnosis
20-05-OUB	QLOU-EB-2020-A	Normal
	QLOU-EB-2020-B	2-hydroxyglutaric aciduria
	QLOU-EB-2020-C	Ornithine transcarbamylase deficiency
20-07-OUB	QLOU-EB-2020-D	3-hydroxy-3-methylglutaryl-CoA lyase deficiency
	QLOU-EB-2020-E	Tyrosinemia type I
	QLOU-EB-2020-F	Normal
20-09-OUB	QLOU-EB-2020-G	Multiple acyl-CoA dehydrogenase deficiency (MADD)
	QLOU-EB-2020-H	Normal

	QLOU-EB-2020-I	Citrullinemia type I

The scheme format was kept identical to those of previous years. Samples were shipped by regular mail. Details regarding stability of samples are provided in the sample package.

Evaluation of results was performed using Excel with the submitted results extracted from the database by the website manager.

5. Results

Table 4: Receipt of results in the 2020 ERNDIM QLOU *Barcelona* scheme.

Survey	In time	Late	Total
20-05-OUB	65	0	65
20-07-OUB	67	0	67
20-09-OUB	67	0	67

Table 5: Returned results in the 2020 ERNDIM QLOU *Barcelona* scheme.

Submissions	Number of laboratories	%
3	62	83
2	6	8
1	1	1
0	6	8

6. Website reporting

The website reporting system is compulsory for all centres. Please read carefully the following advice:

- Results
  - Give quantitative data as much as possible.
  - Enter the key metabolites with the evaluation **in the tables** even if you don't give quantitative data.
  - If the profile is normal: enter "Normal profile" in "Key metabolites".
  - **Don't enter results in the "comments" window**, **otherwise your results will not be included in the evaluation program.**
- ***Diagnosis***
  - **Don't enter the diagnosis in the "comments" window**, **otherwise your results will not be included in the evaluation program.**
- Recommendations = **advice for further investigation**.
  - Scored together with the interpretative score.
  - Advice for treatment are not scored.
  - **Don't give advice for further investigation in "Comments on diagnosis"**: it will not be included in the evaluation program.

7. Scoring of results

A scoring system was developed in 2012 and approved by the ERNDIM Scientific Advisory Board. Similar to other qualitative (proficiency testing) ERNDIM schemes, the maximum score for a sample is 4 points.
Qualitative results and diagnostic proficiency of the 2020 samples were scored using the criteria given in Table 6. These criteria have been set by the Scientific Advisor, approved by the Scientific Advisory Board. The final decision about scoring of the scheme is made in the Scientific Advisory Board (SAB) during the Autumn meeting (November 20th, 2020).

Table 6: General criteria used to score results

Satisfactory	4	Helpful but incomplete	3
Not helpful	2	Slightly misleading	1
Misleading	0		

Starting with the 2014 schemes the concept of 'critical error' is introduced to the assessment of the qualitative schemes. Labs failing to make a correct diagnosis of a sample considered eligible for this category will be deemed not to have reached a satisfactory performance even if their total points for the year is sufficient according to the requirement set by the SAB. The classification of samples to be judged for critical error was undertaken at the SAB meeting held on November 20th, 2020.

Table 7: Samples eligible for critical errors in the 2020 ERNDIM QLOU *Barcelona* scheme.

Sample	Critical errors
QLOU-EB-2020-B	3 for failing to identify 2-hydroxyglutaric aciduria
QLOU-EB-2020-D	4 for failing to identify 3-hydroxy-3-methylglutaryl-CoA lyase deficiency
QLOU-EB-2020-G	1 for filing to multiple acyl-CoA dehydrogenase deficiency

Details are given under item 9 'Results of individual samples and evaluation of reporting'.

We are required to define "Participation" for the purpose of the ERNDIM Annual Certificate which covers all ERNDIM schemes. For this urinary organic acid scheme we have defined "**Participation**" as requiring **at least two returns during the year**. Failure to meet this requirement will result in the certificate of participation showing 'non-submitter' rather than 'satisfactory' or 'unsatisfactory'.

Satisfactory performance is defined as **70% of maximum score** which equates **25/36** points for three returns and **17/24** points for two returns.

If your laboratory is assigned poor performance and you wish to appeal against this classification please email the ERNDIM Administration Office (admin@erndim.org), with full details of the reason for your appeal, within one month receiving your Performance Support Letter.

8. Proficiency of the 2020 surveys

ERNDIM provides a single certificate for all its schemes with details of participation and performance.

In 2020, 62 participants submitted 3 reports. From the 62 ordinary (non-educational) participants 54 (87%) achieved satisfactory performance (score ≥ *25 / 17*, no critical error). 8 participants did not accomplish satisfactory performance.
Overall proficiencies of each sample are depicted in Table 8.

Table 8: Overall proficiencies of the 2020 surveys.

Sample ID	Sample type	Proficiency (%)
QLOU-EB-2020-A	Normal	98%
QLOU-EB-2020-B	2-hydroxyglutaric aciduria	98%
QLOU-EB-2020-C	Ornithine transcarbamylase deficiency – **Educational sample**	68%
QLOU-EB-2020-D	3-hydroxy-3-methylglutaryl-CoA lyase deficiency	96%
QLOU-EB-2020-E	Tyrosinemia type I	89%
QLOU-EB-2020-F	Normal	100%
QLOU-EB-2020-G	Multiple acyl-CoA dehydrogenase deficiency (MADD)	90%

QLOU-EB-2020-H	Normal	99%
QLOU-EB-2020-I	Citrullinemia type I	63%

8 Performance Support letters will be sent for the 2020 surveys. 1 of these *8* participants has also received a performance support letter in 2018. Unsatisfactory performance (either due to overall score or due to critical error) within an EQA scheme for at least 2 out of 3 years that the participant has subscribed for will result in a notification letter of unsatisfactory performance to the quality manager or head of department.
For the 2019 scheme 7 Performance Support letters were sent.

9. Results of individual samples and evaluation of reporting

- **Sample QLOU-EB-2020-A:**

Clinical description: Female with autistic behaviour.

Diagnosis: **Normal sample,** obtained from a healthy adult**.** The overall proficiency for the 65 laboratories that submitted their results was 98%.

Interpretation: The majority of laboratories, 64 (98%), reported correctly the result as profile without significative alterations or slight increase of 3-hydroxybutyrate and acetoacetate.
Only one lab detected and increase of 3-hydroxypropionate and 3-hydroxy-isovalerate.

The maximum score of this sample is for the interpretation of normal profile.

- **Sample QLOU-EB-2020-B:**

Clinical description: Female that at 4 years of age presented with development delay, mild mental retardation, tremor and ataxia. Diagnosed at 43 years of age.

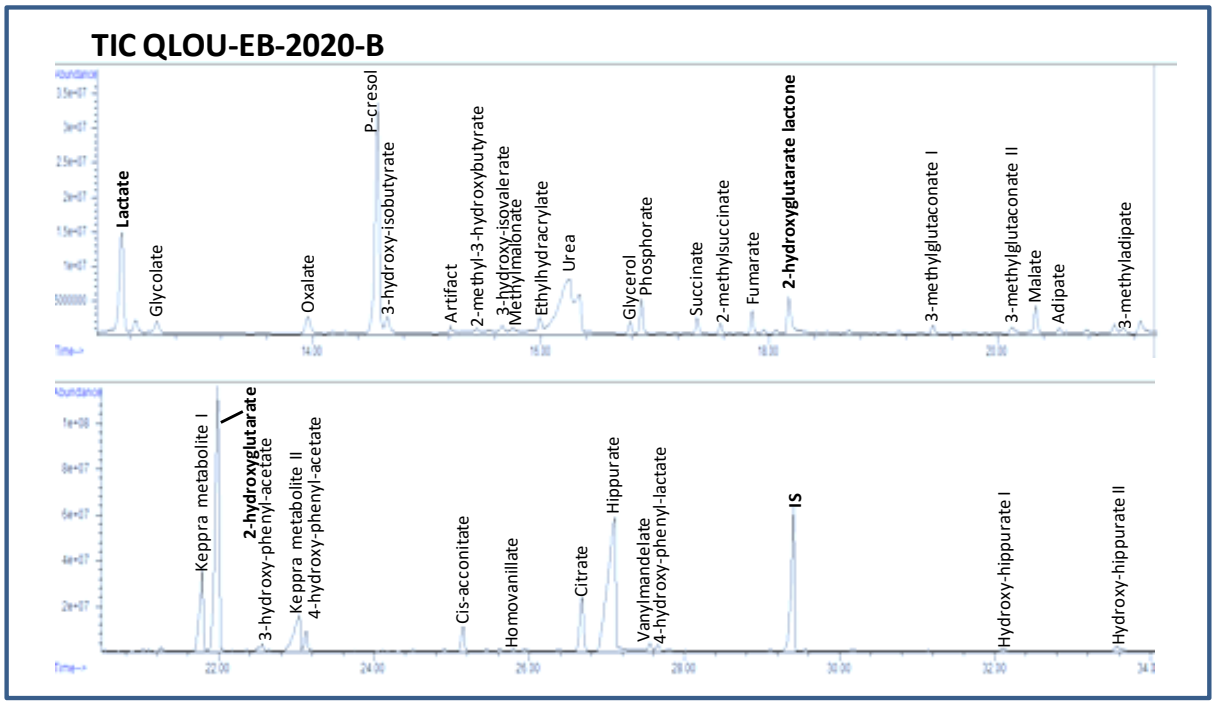
Diagnosis: **L-2-hydroxyglutaric aciduria.** The overall proficiency for the 65 laboratories that submitted their results was 98%.

Analytical details: The organic acid profile showed pathological excretion of 2-hydroxyglutarate and 2-hydroxyglutarate lactone. All the 65 laboratories (100%) reported the increase of 2-hydroxyglutarate. Only 13 participants reported the increase of 2-hydroxyglutarate lactone, for that reason the mass spectrum of this compound was included in the interim report.
2 points were given for the detection of 2-hydroxyglutarate.

Interpretation: the correct diagnosis was performed by the majority of the participants, 62 (95%). **Two** labs reported **multiple acyl-CoA dehydrogenase** deficiency and **one** lab gave the diagnosis of **dihydropyrimidine dehydrogenase deficiency**, probably due to a swap of sample. These three results were **classified as critical errors** in the November SAB critical errors meeting. Although the increase in 2-hydroxyglutaric acid is observed in multiple acyl-CoA dehydrogenase deficiency, an increase in other metabolites is also observed.
The chromatogram of this sample (2-hydroxyglutaric aciduria, **Figure 1**) and of a multiple dehydrogenase acyl-CoA deficiency (sample G, **Figure 3**) both are added in this report to be compared.

The scoring was 2 points for the correct diagnosis of 2-hydroxyglutaric aciduria.

Figure 1. Total ion chromatogram sample QLOU-EB-2020-B.



Methodology: Extraction with Ethylacetate, no oximation, silylation and GC-MS analysis.

- **Sample QLOU-EB-2020-C:**

Clinical description: Female with development delay, diagnosed at 6 years old when she presented hiperamonemia after an episode of infection. At present she is under treatment.

Diagnosis: **Ornithine transcarbamylase deficiency.** The overall proficiency for the 65 laboratories that submitted their results was 68%.

Analytical details: The organic acid profile showed pathological excretion of uracil and an increase of both benzoate and hippurate. Only 35 laboratories (54%), reported the increase of uracil, while 23 laboratories (35%) reported the presence of drug metabolites (benzoate, hippurate).
Due to there were not increased orotic acid in this sample, it was **considered as educational** in the November SAB critical errors meeting. **Therefore the score obtained in the interim report of the first round is not taken into account.**

Interpretation: Only 49 laboratories (54%) reported correctly the diagnosis of ornithine transcarbamylase deficiency.
Two laboratories gave the diagnosis of argininosuccinic aciduria but due to aminoacid analysis. Other individual diagnoses reported were: citrullinemia, succinic semialdehyde dehydrogenase deficiency, short-chain 3-hydroxyacil-CoA dehydrogenase deficiency and combined D,L-2-Hydroxyglutaric aciduria.

- **Sample QLOU-EB-2020-D:**

Clinical description: Female diagnosed at 8 months of age when she had a severe viral infection, diarrhoea, vomiting, metabolic acidosis and hypoglycemia. At present she is under treatment.

Diagnosis: **3-hydroxy-3-methylglutaryl-CoA lyase deficiency.** The overall proficiency for the 67 laboratories that submitted their results was 96%.

Analytical details: The organic acid profile showed pathological excretion of 3-hydroxy-3-methylglutarate, 3-methylglutaconate and 3-methylglutarate, considered as key metabolites. Also an increase of 3-hydroxyisovalerate and 3-methylcronolylglycine were detected. The majority of the laboratories, 63 labs (94%), reported increased 3-hydroxy-3-methylglutarate; 67 participants (100%) reported the increase of 3-methylglutaconate; 63 laboratories (94%) detected increased 3-

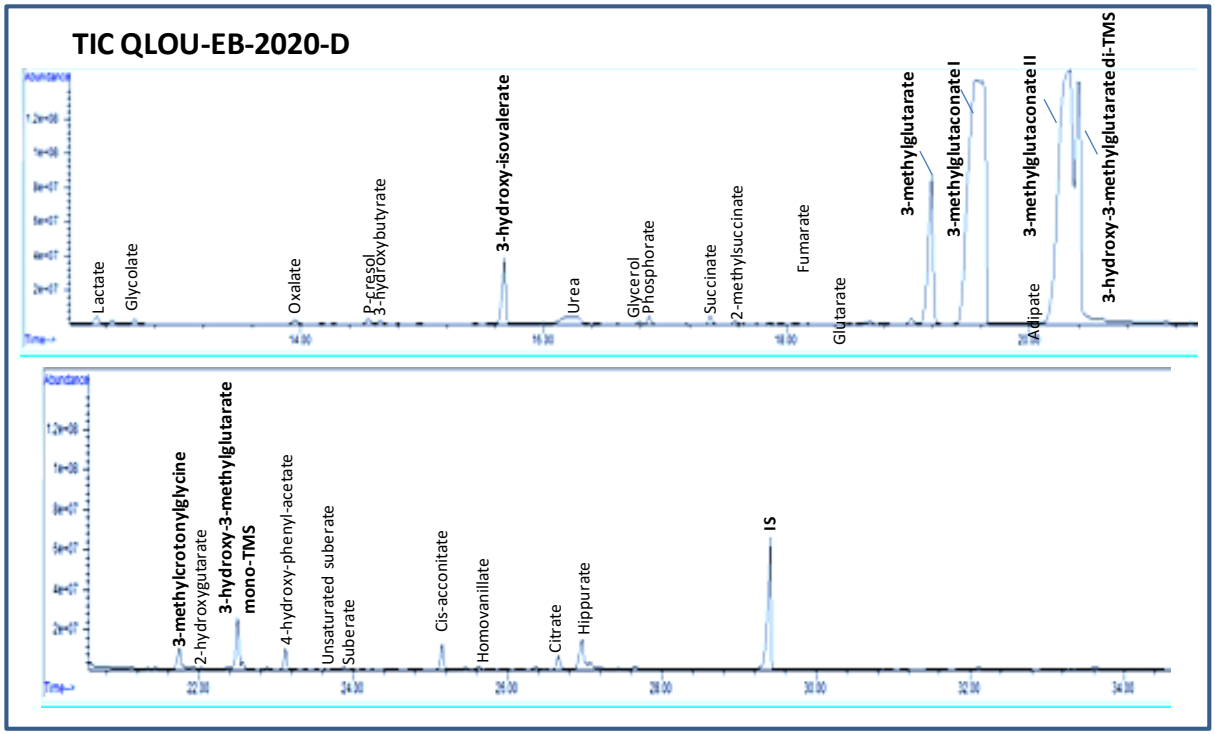
methylglutarate. In addition, high amounts of 3-hydroxy-isovalerate and 3-methylcrotonilglycine were detected by 62 laboratories (93 %) and 57 laboratories (85%) respectively.

The scoring was 2 points for the detection of the three key metabolites and 1 point for the detection of only two key metabolites.

Interpretation: The majority of the laboratories, 63 (94%), reported 3-hydroxy-3-methylglutaryl-CoA lyase deficiency as correct diagnosis.
Three labs reported the diagnosis of **3-methylglutaconic aciduria** and **one** lab gave the diagnosis of **isovalérica aciduria**. These four results were **classified as critical errors** in the November SAB critical error meeting, due to the clinical information as well as the organic acid profile were clear (**Figure 2**).

The scoring was 2 points for the diagnosis of 3-hydroxy-3-methylglutaryl-CoA lyase deficiency.

Figure 2. Total ion chromatogram sample QLOU-EB-2020-D.



Methodology: Extraction with Ethylacetate, no oximation, silylation and GC-MS analysis.

- **Sample QLOU-EB-2020-E:**

Clinical description: Male that presented at 10 months of age with hepatomegaly and several hepatic nodules. Alpha-fetoprotein was very high.

Diagnosis: **Tyrosinemia type I.** The overall proficiency for the 66 laboratories that submitted their results was 89%.

Analytical details: The organic acid profile showed pathological excretion of succylacetone (with oximation method) or hydroxyoxoheptanoate (without oximation method), 4-hydroxyphenyl-lactate and 4-hydroxyphenyl-pyruvate. In addition, increase of 4-hydroxypheyl-acetate was detected. 43 labs (65%) detected increased succinylacetone, 11 of them reported as increase of hydroxyoxoheptanoate that is detected without oximation. In the interim report the mass spectrum of both compounds were shown.
60 participants (90%) detected increased 4-hydroxyphenyl-lactate; 62 participants (94%) detected increase of 4-hydroxyphenylpyruvate; 45 labs (68%) reported increased 4-hydroxypheyl-acetate.

The scoring was 2 points for the detection of the all key metabolites and 1 point for the detection of key metabolites without succinylacetone.

Interpretation: The majority of the laboratories, 63 (94%), reported tyrosinemia type 1 as correct diagnosis. **One lab attributed the alterations to liver dysfunction, which was not considered as critical error because the succylacetone levels were not very high.**

The scoring was points for the diagnosis of tyrosinemia type 1 as first option and 1 point if it is in alternative diagnosis.

- **Sample QLOU-EB-2020-F:**

Clinical description: Female with fatigability. No evident alterations of any test performed after exercise or glucose load.

Diagnosis: **Normal sample**, obtained from a voluntary individual. The overall proficiency for the 66 laboratories that submitted their results was 100%.

Analytical details and interpretation: The 66 participants reported as normal.

The maximum score of this sample is for the interpretation of normal profile.

- **Sample QLOU-EB-2020-G:**

Clinical description: Female diagnosed at 4 years of age. She presented hypoglycemia and hiperamoniemia after pneumonia. At present she is under treatment.

Diagnosis: **Multiple acyl-CoA dehydrogenase deficiency (MADD).** The overall proficiency for the 67 laboratories that submitted their results was 90%.

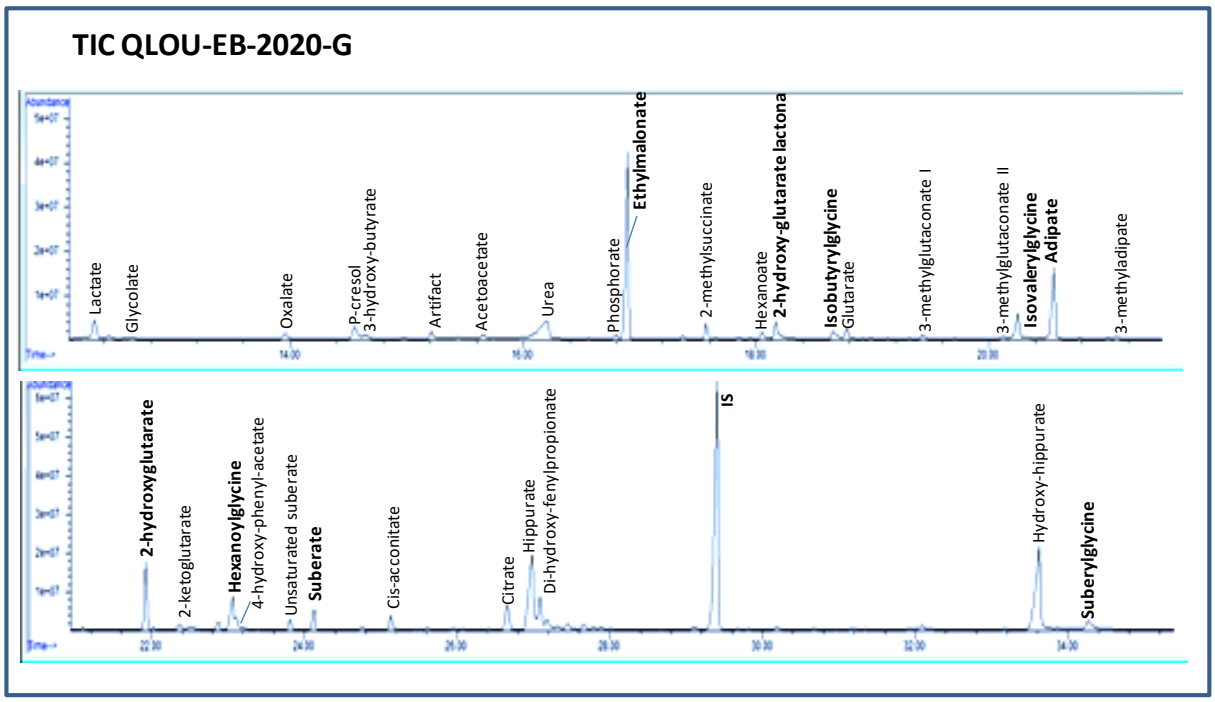
Analytical details: The organic acid profile showed pathological excretion of the kay metabolites: ethylmalonate, 2-hydroxyglutarate, 2-hydroxyglutarate lactone and acylglycines (isovalerylglycine, isobutyrylglycine, hexanoylglycine and suberylglycine), **Figure 3**. In addition an increase of adipate and suberate was detected. Increased ethylmalonate was detected by 60 labs (90%); 66 laboratories (99%) reported the increase of 2-hydroxyglutarate; 59 participants (88%) detected increased hexanoylglycine. In addition, high amounts of isobutyrylglycine, suberylglycine and adipate were detected by 52 laboratories (78 %), 38 participants (57%) and 42 laboratories (63%) respectively. Also many labs reported increase of isovalerylglycine.

The scoring was 2 points for the detection of the key metabolites and 1 point if some key metabolite is not reported.

Interpretation: The majority of the laboratories, 60 (90%), reported multiple acyl-CoA dehydrogenase deficiency (MADD) or glutaric aciduria type II (GAII) as correct diagnosis.
Five participants reported the diagnosis of medium chain acyl-CoA dehydrogenase deficiency.
The organic acid profile is clearly different of a medium chain acyl-CoA dehydrogenase deficiency (MCAD). Other individual diagonoses reported were: 2-hydroxyglutaric aciduria methylmalonic aciduria.
This year the diagnosis of MCAD or other diagnosis has not been considered as critical error, but missing MADD diagnosis in a future circulated sample will be considered as critical error due to the biochemical results can distingue between the different entities.

The scoring was 2 points for the diagnosis of MADD or GAII.

Figure 3. Total ion chromatogram sample QLOU-EB-2020-G.



Methodology: Extraction with Ethylacetate, no oximation, silylation and GC-MS analysis.

- **Sample QLOU-EB-2020-H:**

Clinical description: Male with developmental delay. MRI and physical examination were normal.

Diagnosis: **Normal sample**, obtained from a healthy adult. The overall proficiency for the 67 laboratories that submitted their results was 99%.

Interpretation: All laboratories except one (99%), reported correctly the result as profile without specific alterations. Only one lab detected and important increase of methylmalonic acid, but it could not be demonstrated whether it was a sample cross.

The maximum score of this sample is for the interpretation of normal profile.

- **Sample QLOU-EB-2020-I:**

Clinical description: Male under treatment that presents epilepsy and language delay from 4 years of age.

Diagnosis: **Citrullinemia type I.** The overall proficiency for the 66 laboratories that submitted their results was 63%.

Analytical details: The key metabolites were uracil, cyclic derivate of citrulline and benzoate. No an evident increase of orotic acid was detected. Only 31 laboratories (46%) reported the increase of cyclic derivate of citrulline, 12 participants (18%) detected increased uracil, 26 labs (39%) reported increase of benzoate and 36 laboratories (54%) detected an increase of orotic acid.

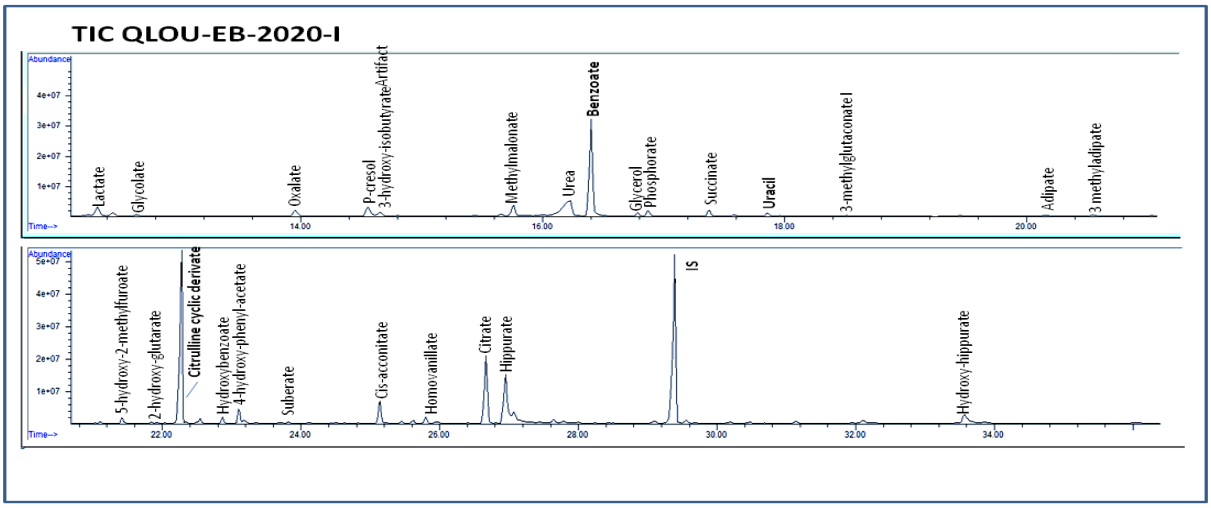
At the November SAB Critical Error meeting it was discussed that some labs did not get a large amount of cyclic derivate of citrulline as seen in the TIC image added in this report. **It could depend on the methodology.** In the **Figure 4 is shown the TIC image** obtained from a GC-MS after using ethyl acetate extraction, without oximation and with silylation.

The scoring was 2 points for the detection of cyclic derivate of citrulline and 1 point if only one or two key metabolites are reported without the cyclic derivate of citrulline.

Interpretation: 47 laboratories (71%) reported citrullinemia or urea cycle disorder as correct diagnosis. 10 participants reported the diagnosis of methylmalonic aciduria or cobalamin deficiency. 4 laboratories reported as normal sample. Other individual diagnoses given were multiple acyl-CoA dehydrogenase deficiency, phenylketonuria, guanidinoacetate methyltransferase deficiency, malonic aciduria and combined methylmalonic and malonic aciduria.

The scoring was 2 points for the diagnosis of citrullinemia or urea cycle disorder as first option or in alternative diagnosis

Figure 4. Total ion chromatogram sample QLOU-EB-2020-I.



Methodology: Extraction with Ethylacetate, no oximation, silylation and GC-MS analysis.

10. Scores of participants

Table 9 presents detailed scores and performance data for all participants.

Scores and performance data were confirmed by the Scientific Advisory Board meeting in November 2020.

The anonymous data are accessible to all participants. Individual data are only visible to your laboratory.

Lab no	A	B	C*)	sum	D	E	F	sum	G	H	I	sum	Total score	Performance
1	4	4		8	4	2	4	10	4	4	0	8	26	
2	0	4		4	1	4	4	9	1	4	0	5	18	PP, CE
3	4	4		8	4	3	4	11	4	4		8	27	
4	4	4		8	4	4	4	12	4	4	4	12	32	
5	4	4		8	4	4	4	12	4	4	4	12	32	
6	4	4		8	4	4	4	12	3	4	3	10	30	
7	4	4		8	4	2	4	10	4	4	4	12	30	

Lab no	A	B	C*)	sum	D	E	F	sum	G	H	I	sum	Total score	Performance
8	4	4		8	4	4	4	12	4	4	4	12	32	
9	4	4		8	1	4	4	9	4	4	4	12	29	CE
10	4	4		8				0	4	4	0	8	16	TWO RETURNS
11	4	4		8	4	4	4	12	4	4	2	10	30	
12				0				0				0	0	NO RETURN
13				0	4	3	4	11				0	11	ONE RETURN
14	4	4		8	4	4	4	12	4	4	4	12	32	
15	4	4		8	4	4	4	12	4	4	4	12	32	
16	4	4		8	4	3	4	11	0	4	0	4	23	CE
17	4	4		8	4	4	4	12	4	4	4	12	32	
18	4	4		8	4	3	4	11				0	19	TWO RETURNS
19	4	4		8	4	4	4	12	4	4	4	12	32	
20	4	4		8	4	4	4	12	4	4	4	12	32	
21	4	4		8	4	4	4	12	4	4	4	12	32	
22	4	4		8	4	3	4	11	4	4	4	12	31	
23	4	4		8	4	4	4	12	4	4	4	12	32	
24	4	4		8	4	3	4	11	4	4	3	11	30	
25	4	2		6	4	4	4	12	4	4	3	11	29	CE
26	4	4		8	4	4	4	12	4	4	4	12	32	
27	4	4		8	4	4	4	12	4	4	3	11	31	
28	4	4		8	4	3	4	11	4	4	3	11	30	
29	4	4		8	4	4	4	12	4	4	4	12	32	
30	4	4		8	4	4	4	12	4	4	4	12	32	
31	4	4		8	4	4	4	12	4	4	3	11	31	

Lab no	A	B	C*)	sum	D	E	F	sum	G	H	I	sum	Total score	Performance
32	4	4		8	4	4	4	12	4	4	3	11	31	
33	4	4		8	4	4	4	12	4	4	4	12	32	
34	4	4		8	4	4	4	12	4	4	4	12	32	
35	4	4		8	4	4	4	12	1	4	4	9	29	
36	4	4		8	4	3	4	11	4	4	1	9	28	
37	4	4		8	4	4	4	12	4	4	4	12	32	
38	4	2		6	4	4	4	12	4	4	0	8	26	CE
39	4	4		8	4	4	4	12	4	4	3	11	31	
40	4	4		8	4	4	4	12	4	4	4	12	32	
41	4	4		8	4	4	4	12	2	4	0	6	26	
42	4	4		8	4	4	4	12	4	4	4	12	32	
43	4	4		8				0	4	4	0	8	16	TWO RETURNS
44	4	4		8	4	4	4	12	4	4	3	11	31	
45	4	4		8	4	3	4	11	3	4	3	10	29	
46	4	4		8	4	3	4	11	4	4	0	8	27	
47	4	4		8	4	4	4	12	4	4	0	8	28	
48	4	4		8	4	2	4	10	4	4	4	12	30	
49				0	4	4	4	12	4	4	0	8	20	TWO RETURNS
50	4	4		8	4	4	4	12	3	4	4	11	31	
51	4	4		8	4	4	4	12	4	4	0	8	28	
52				0	4	4	4	12	4	0	0	4	16	TWO RETURNS
53	4	4		8	1	3	4	8	3	4	0	7	23	CE
54	4	4		8	2			2	4	4	4	12	22	CE
55				0				0				0	0	NO RETURNS

Lab no	A	B	C*)	sum	D	E	F	sum	G	H	I	sum	Total score	Performance
56	4	4		8	4	4	4	12	4	4	4	12	32	
57	4	4		8	4	4	4	12	4	4	4	12	32	
58				0	4	2	4	10	4	4	1	9	19	TWO RETURNS
59	4	4		8	4	4	4	12	4	4	0	8	28	
60	4	4		8	4	3	4	11	1	4	0	5	24	
61				0				0				0	0	NO RETURNS
62	4	4		8	4	3	4	11	4	4	3	11	30	
63				0				0				0	0	NO RETURNS
64	4	4		8	4	3	4	11	4	4	1	9	28	
65	4	4		8	4	3	4	11	4	4	2	10	29	
66	4	4		8	4	4	4	12	4	4	4	12	32	
67	4	4		8	4	4	4	12	1	4	4	9	29	
68	4	4		8	4	3	4	11	3	4	0	7	26	
69	4	4		8	4	3	4	11	4	4	3	11	30	
70	4	4		8	4	3	4	11	3	4	3	10	29	
71				0				0				0	0	NO RETURNS
72	4	2		6	4	3	4	11	4	4	0	8	25	CE
73	4	4		8	4	2	4	10	2	4	4	10	28	
74				0				0					0	EDUCATIONAL
75	4	4		8	4	4	4	12	4	4	4	12	32	

*) Educational sample
CE: Critical error
PP: Poor performance (on score)

Your laboratory scores for 2020:

ERNIDM Number: «ERNDIM_Number»

Lab number in the above table:«lab_no»

Total score 2020:«Total Score»

11. Preview of the scheme in 2021

The format of the QLOU 2021 scheme will be similar to that of previous years.

Changes planned for 2021:
Annual reports are intended to be produced automatically by a software developed by CSCQ.
The number of total of samples sending will be 6 divided in two rounds.

Judit García Villoria
March 2021

Judit Garcia
Scientific Advisor

Please note:
This annual report is intended for participants of the ERNDIM QLOU scheme. The contents should not be used for any publication without permission of the scheme advisor

APPENDIX 1. **Change log (changes since the last version)**

Version Number	Published	Amendments
1	17 March 2021	2020 annual report published

END