Amino Acids Interpretation (AAI) Scheme

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2024 Second Round Interim Report *(DOC5149)*

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Please Note:

- This interim report is intended for participants of the ERNDIM AAI scheme. The contents should not be used for any publication without permission of the Scientific Advisor.
- This is an interim report and it includes provisional scores only. All scores are subject to change following moderation at the Scientific Advisory Board meeting in autumn of this year. For final scores and performance data the ERNDIM AAI Annual Report should be referred to.
- The fact that your laboratory participates in this scheme is not confidential, however, the raw data and performance scores are confidential and will only be shared within ERNDIM for the purpose of evaluating your laboratories performance, unless ERNDIM is required to disclose performance data by a relevant government agency. For details please see the ERNDIM Privacy Policy on www.erndim.org.

1. Results Submission

The deadline for submission of the 2024 second round results was 9th September 2024. Participants were able to view the cases and submit their results using the ERNDIM Formdesk website.

143 laboratories registered for the 2024 AAI scheme, of these 140 labs (98%) submitted results for the second round.

Note: all results must be submitted in English.

2. Scoring System

As for the previous circulations, each of the three aspects, analytical findings, diagnosis, and further tests, were scored equally with a maximum of two points for each category. Plasma amino acid concentrations together with the laboratories reference ranges were provided.

The tables (Table 1-3) show scoring to which the evaluators agreed previously. Scoring was done by two blinded evaluators each (the evaluators were blinded to both the ERN number and to the scores of the second evaluator). If the scores were not concordant the scheme advisor scored in addition. Further close evaluation based on agreed/revised scoring criteria was used to determine on the final score.

Figure 1 shows an example of scoring

Case 6 abnormalities	1	2		2024.06 abnormalities	Case 6 diagnosis	1	2		2024.06 diagnosis	Case 6 further testing recommendations	1	2	
elevated pea 2 points, AP 2 points, maximum 2 points			SSB		Hypophosphatasia 2 points, Pyridoxine-responsive seizures 1 point, maximum 2 points			SSB		pea (P, CSF, U), AP in plasma, vitmin B6 metabolites each 1 point, molecualrgenetic analysis of *ALPL* gene (2 points) or of *ALDH7A1* (1 point) or molecualrgenetic analysis if diagnosis is right maximum 2 points			
Grossly elevated excretion of phosphoethanolamine. Elevated taurine excretion. Mildly low urine cystine. ALT and AST normal with undetectable ALP activity.	#	#	#	2,00	Elevated PEA with low ALP is suggestive of hypophosphatasia. Likely low pyridoxine due to low dephosphorylation of PLP and uptake.	#	#	#	2,00	Confirm diagnosis with genetic analysis of ALPL gene. Review CSF levels of PLP and pyridoxine. Review calcium status and PPi. Consider bone density analysis.	#	#	#

Figure 1: Example of scoring for case 2024-6.

[1]**If this Report is not Version 1 for this scheme year, go to APPENDIX 2 (page 9) for details of the changes made since the last version of this document.**

3. Results of samples and evaluation of reporting

3.1. Case 2024-4: Citrin deficiency

3.1.1. Sample Details

The sample (plasma) was from an eight-month-old boy who was admitted for anaemia and acute liver failure. The cause of the liver failure was later identified by molecular genetics as citrin deficiency (homozygous mutation in *SLC25A13*).

The neonatal screening was normal, in particular no increased citrulline concentration was detectable. The parents are cousins I°. The family history was otherwise unremarkable, there are two healthy brothers.

3.1.2. Scoring details

Table 1: Scoring details for case 2024-4.

	Interpretation		Score (points)
Findings, abnormalities [A, maximum 2 points]	elevated	met, tyr	1
	elevated	cit	1
	elevated	thr	1
Diagnosis [D, maximum 2 points]	liver failure or tyrosinaemia type I or galactosemia		1
	citrin deficiency		2
Further tests (if molecular genetics recommended, specify the gene) **[R, maximum 2 points]**	organic acids (urine) inclusive succinylacetone		1
	galactose-1-phosphate or galactose or GALT activity		1
	Molecular genetic analyses (*SLC25A13*)		2

Scores for participating laboratories are in APPENDIX 1 on page 6.

3.1.3. Comments on overall performance

The diagnosis of a citrine deficiency is very difficult under certain circumstances. On the one hand, the citrulline concentration can be almost unnoticeable and on the other hand, the other changes can also only be discrete or secondary to liver failure. However, as the therapy differs from that of other metabolic disorders such as tyrosinaemia type I, early diagnosis is essential.

Despite these diagnostic difficulties, 70% of participants reported citrin deficiency either as the main diagnosis or as a differential diagnosis. The most common differential diagnosis was tyrosinaemia type I, which was scored with one point (in 28% of the participants).

The overall proficiency was 87%, with the description of the abnormalities being the best with 96% correct answers.

3.1.4. Best interpretation (scored with 2 points each)

- **Findings:** The patient exhibits highly elevated methionine and tyrosine levels, with elevated glutamine, threonine, lysine, cystine and citrulline levels. Rest of the amino acids are within the reference ranges. Ammonia is slightly increased.
- **Diagnosis**: Citrullinaemia type II (Neonatal intrahepatic cholestasis caused by citrin deficiency (NICCD)). Elevation of methionine and tyrosine due to liver dysfunction. DD: Tyrosinaemia type I.
- **Further tests:** Identification of pathogenic variants in the *SLC25A13* gene. For DD: test urine and DBS for succinylacetone, alpha-fetoprotein in serum, *FAH* gene analysis. Organic acids in urine, orotic acid in urine.

3.2. Case 2024-5: Branched-chain 2-ketoacid dehydrogenase kinase (BCKDK) deficiency

3.2.1. Sample details

The sample was taken from a five-year-old boy who had microcephaly, mental retardation and a failure to thrive. In the extended work-up, cerebral MRI showed enlargement of the peri-cerebral spaces of the lateral ventricles and delayed myelinisation. The analysis of amino acids showed isolated reduced concentrations of branched-chain amino acids. A pubmed search with the search terms 'microcephaly leucine valine isoleucine' resulted in the correct diagnosis (branched-chain 2-ketoacid dehydrogenase kinase deficiency).

3.2.2. Scoring details

Table 2: Scoring details for case 2024-5.

	Interpretation		**Score (points)**
Findings, abnormalities [A, maximum 2 points]	decreased	BCAA (ile, val, leu)	2
Diagnosis [D, maximum 2 points]	BCKDK deficiency		2
	glucose infusion or anabolism (hyperinsulinism)		1
Further tests (if molecular genetics recommended, specify the gene) **[R, maximum 2 points]**	molecular analysis of *BCKDK* gene		2
	Repetition of the determination of amino acids in plasma		1

Scores for participating laboratories are in APPENDIX 1 on page 6.

3.2.3. Comments on overall performance

All participants have correctly described the biochemical abnormalities. However, the interpretations differed, but 121 participants made the correct diagnosis. Some participants suspected malnutrition or an incorrect diet for MSUD as the cause, this was awarded zero points.

The overall proficiency was 91%.

3.2.4. Best interpretation (scored with 2 points each)

- **Findings:** Substantially decreased concentrations of the branched-chain amino acids - leucine, isoleucine and valine. Rest of profile normal.
- **Diagnosis:** This profile, together with the clinical information provided, suggests branched-chain keto acid dehydrogenase kinase (BCKDK) deficiency. Decreased branched-chain amino acids can also be observed in a context of hyperinsulinism: however, the clinical information is not suggestive of this.
- **Further tests**: Repeat plasma amino acids and correlate with nutritional status. Check blood glucose and perform relevant endocrine testing to rule out hyperinsulinism. Perform molecular analysis of the *BCKDK* gene.

3.3. Case 2024-6: Hypophosphatasia

3.3.1. Sample details

The results are from a girl who developed cerebral seizures at the age of 6 days that partially responded to vitamin B6. In addition, low alkaline phosphatase activity was observed. The phosphoethanolamine concentration was significantly increased. Hypophosphatasia (with pyridoxine-responsive seizures) due to mutations in ALPL gene was confirmed.

3.3.2. Scoring details

Table 3: Scoring details for case 2024-6.

	Interpretation		Score (points)
Findings, abnormalities [A, maximum 2 points]	elevated	PEA	2
	decreased	AP	2
Diagnosis [D, maximum 2 points]	Hypophosphatasia		2
	Pyridoxine-responsive seizures		1
Further tests (if molecular genetics recommended, specify the gene) **[R, maximum 2 points]**	Phosphoethanolamine (P, CSF, U)		1
	alkaline phosphatase (AP) in plasma		1
	determination of vitamin B6 metabolites		1
	Molecular genetic analysis of *ALPL* gene		2
	Molecular genetic analysis of *ALDH7A1* gene		1

Scores for participating laboratories are in APPENDIX 1 on page 6.

3.3.3. Comments on overall performance

All participants correctly described the biochemical abnormalities and thus recognised that it was a congenital metabolic disorder. 135 participants also made the correct diagnosis. The overall proficiency was 98%.

3.3.4. Best interpretation (scored with 2 points each)

- **Findings**: A significantly elevated phosphoethanolamine concentration together with a reduction in alkaline phosphatase activity (normal transaminases) on the liver function test were observed.
- **Diagnosis:** Main diagnosis: Congenital hypophosphatasia. Diagnosis is supported by elevated phosphoethanolamine and lowered alkaline phosphatase. Clinical features match with known cases of hypophosphatasia.
- **Further tests:** Perform: Pyridoxal phosphate (PLP) level in plasma. Calcium and phosphate in serum. Confirmatory test: genetic analysis of *ALPL* gene

3.4. Comments on the whole of the second-round results 2024

We hope that we were able to provide the participants with interesting and instructive cases in the second round as well. The overall proficiency of 92% was above the expected range despite two very rare diagnoses (citrin deficiency and branched-chain 2-ketoacid dehydrogenase kinase deficiency).

Table 4: Overall scores for the second circulation in the amino acid interpretation scheme.

	2024.04 abnormalities	2024.04 diagnosis	2024.04 recommendations	2024.04 Sum	2024.05 abnormalities	2024.05 diagnosis	2024.05 recommendations	2024.05 Sum	2024.06 abnormalities	2024.06 diagnosis	2024.06 recommendations	2024.06 Sum	Sum 2024.04-2024.06
total	**268**	**235**	**231**	**734**	**280**	**244**	**241**	**765**	**280**	**273**	**271**	**824**	**1647**
% prof.	**96%**	**84%**	**83%**	**87%**	**100%**	**87%**	**86%**	**91%**	**100%**	**98%**	**97%**	**98%**	**92%**

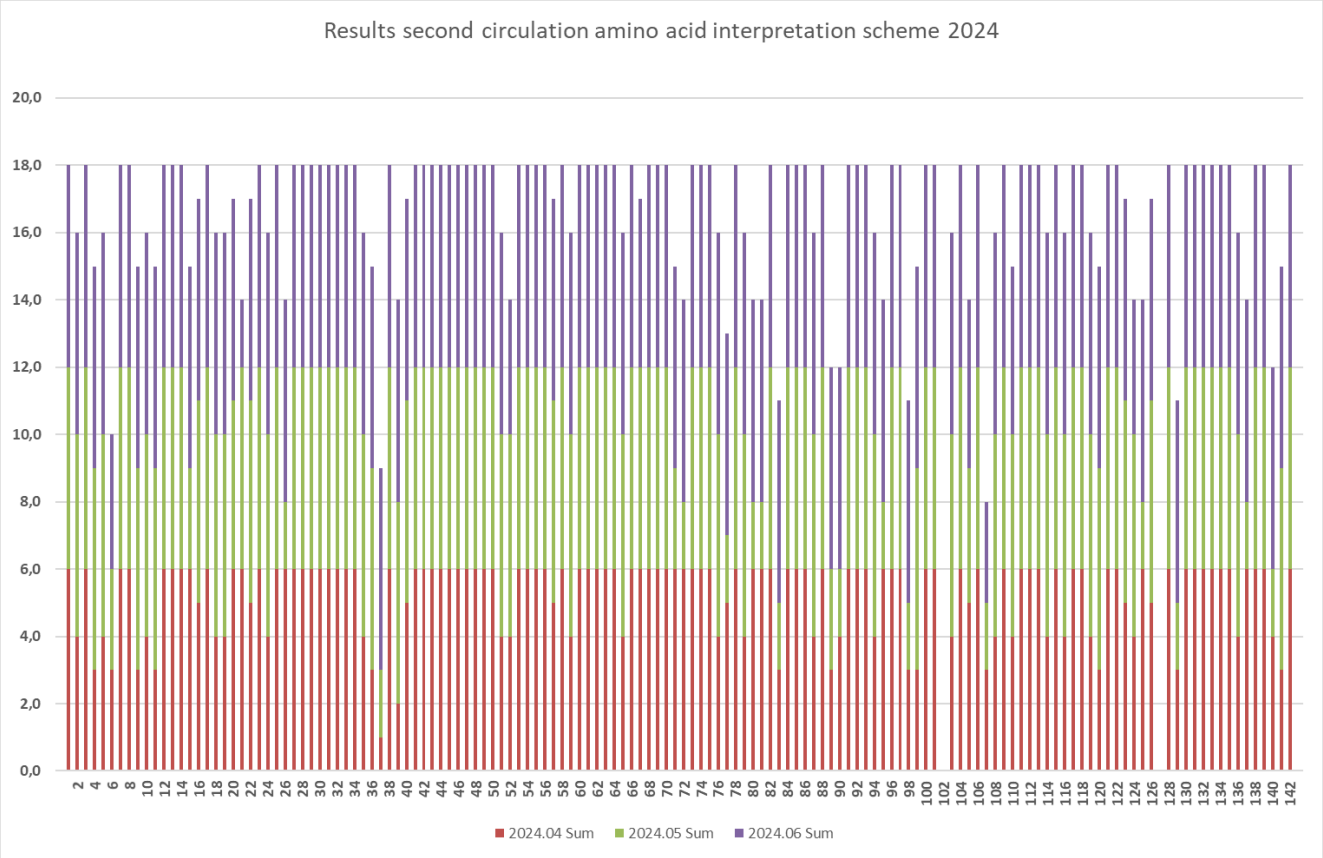

Figure 2: Detailed scores for the second circulation in the amino acid interpretation scheme.

We encourage participants to send us comments and suggestions regarding this scheme and do not hesitate to contact us if you question any of our scoring.

Date: 25.11.2024
The Scientific Evaluators

Sabine Scholl-Bürgi, Scientific Advisor
Scheme Assessors: Apolline Imbard (Deputy Scientific Advisor), Olivier Braissant, Rachel Carling, Alistair Horman, Daniela Karall, and Anke Schumann

APPENDIX 1. Detailed scores for submitting laboratories

Key

A = Findings, abnormalities

D = Diagnosis

R = Recommendations for further testing

DNS = Did not submit

Anon. lab number	2024.04				2024.05				2024.06				2024.04 - .06
	A	D	R	Sum	A	D	R	Sum	A	D	R	Sum	Total Score
1	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
2	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
3	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
4	1.0	1.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**15.0**
5	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
6	2.0	0.0	1.0	**3.0**	2.0	0.0	1.0	**3.0**	2.0	1.0	1.0	**4.0**	**10.0**
7	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
8	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
9	1.0	1.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**15.0**
10	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
11	1.0	1.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**15.0**
12	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
13	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
14	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
15	2.0	2.0	2.0	**6.0**	2.0	1.0	0.0	**3.0**	2.0	2.0	2.0	**6.0**	**15.0**
16	2.0	2.0	1.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
17	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
18	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
19	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
20	2.0	2.0	2.0	**6.0**	2.0	2.0	1.0	**5.0**	2.0	2.0	2.0	**6.0**	**17.0**
21	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	0.0	0.0	**2.0**	**14.0**
22	2.0	1.0	2.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
23	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
24	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
25	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
26	2.0	2.0	2.0	**6.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**14.0**
27	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
28	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
29	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
30	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
31	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
32	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
33	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
34	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
35	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
36	1.0	1.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**15.0**
37	1.0	0.0	0.0	**1.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**9.0**
38	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**

Anon. lab number	2024.04				2024.05				2024.06				2024.04 - .06
	A	D	R	Sum	A	D	R	Sum	A	D	R	Sum	Total Score
39	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**14.0**
40	2.0	2.0	1.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
41	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
42	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
43	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
44	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
45	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
46	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
47	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
48	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
49	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
50	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
51	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
52	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	1.0	1.0	**4.0**	**14.0**
53	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
54	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
55	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
56	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
57	2.0	2.0	1.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
58	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
59	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
60	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
61	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
62	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
63	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
64	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
65	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
66	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
67	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	1.0	**5.0**	**17.0**
68	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
69	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
70	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
71	2.0	2.0	2.0	**6.0**	2.0	1.0	0.0	**3.0**	2.0	2.0	2.0	**6.0**	**15.0**
72	2.0	2.0	2.0	**6.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**14.0**
73	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
74	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
75	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
76	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
77	2.0	2.0	1.0	**5.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**13.0**
78	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
79	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
80	2.0	2.0	2.0	**6.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**14.0**
81	2.0	2.0	2.0	**6.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**14.0**
82	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
83	2.0	1.0	0.0	**3.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**11.0**

Anon. lab number	2024.04				2024.05				2024.06				2024.04 - .06
	A	D	R	Sum	A	D	R	Sum	A	D	R	Sum	Total Score
84	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
85	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
86	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
87	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
88	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
89	1.0	1.0	1.0	**3.0**	2.0	0.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	**12.0**
90	2.0	1.0	1.0	**4.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**12.0**
91	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
92	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
93	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
94	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
95	2.0	2.0	2.0	**6.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**14.0**
96	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
97	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
98	1.0	1.0	1.0	**3.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**11.0**
99	1.0	1.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**15.0**
100	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
101	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
102													**DNS**
103	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
104	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
105	2.0	2.0	1.0	**5.0**	2.0	2.0	0.0	**4.0**	2.0	2.0	1.0	**5.0**	**14.0**
106	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
107	1.0	1.0	1.0	**3.0**	2.0	0.0	0.0	**2.0**	2.0	0.0	1.0	**3.0**	**8.0**
108	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
109	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
110	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	1.0	**5.0**	**15.0**
111	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
112	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
113	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
114	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
115	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
116	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
117	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
118	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
119	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
120	1.0	1.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**15.0**
121	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
122	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
123	2.0	2.0	1.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
124	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	1.0	1.0	**4.0**	**14.0**
125	2.0	2.0	2.0	**6.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**14.0**
126	2.0	1.0	2.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
127													**DNS**
128	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**

Anon. lab number	2024.04				2024.05				2024.06				2024.04 - .06
	A	D	R	Sum	A	D	R	Sum	A	D	R	Sum	Total Score
129	1.0	1.0	1.0	**3.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**11.0**
130	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
131	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
132	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
133	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
134	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
135	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
136	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
137	2.0	2.0	2.0	**6.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**14.0**
138	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
139	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
140	2.0	1.0	1.0	**4.0**	2.0	0.0	0.0	**2.0**	2.0	2.0	2.0	**6.0**	**12.0**
141	1.0	1.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**15.0**
142	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
143													**DNS**

APPENDIX 2. Change log (changes since the last version)

Version Number	Published	Amendments
1	25 November 2024	• 2024 second round interim report published

END OF REPORT