Amino Acids Interpretation (AAI) Scheme

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2024 First Round Interim Report *(DOC5136)*

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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 first round results was 28th May 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 first round.

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 laboratory method used and 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.

Case 2 abnormalities	1	2	3	2024.02 abnormalities	Case 2 diagnosis	1	2	4	2024.02 diagnosis	Case 2 further testing recommendations	1	2	4	2024.02 recommendations
elevated gln or cit 1 point, reduced lys, arg, orn 1 point, maximum 2 points					lysinuric protein intolerance (LPI) 2 points, malnutrition 1 point, maximum 2 points					each 1 point, maximum 2 points: orotic acid (organic acids) in urine; amino acids in urine; ammonia, ferritine, triglycerides; molecular genetic analysis SLC7A7 gene				
Low levels of the dibasic amino acids lysine, arginine, and ornithine with an increased glutamine level.	#	#	#	2,0	This pattern is most consistent with lysinuric protein intolerance.	#	#	#	2,0	Recommend urine amino acids and orotic acid, a blood ammonia, and plasma triglycerides and ferritin. Restrict protein and refer to a metabolic genetics specialist. Confirm with molecular testing of the SLC7A7 gene.	#	#	#	2,0

Figure 1: Example of scoring for case 2024-2.

[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 2024-1: Argininosuccinic aciduria (ASL deficiency)

3.1.1. Sample Details

The results are from a 3-day-old girl whose clinical situation deteriorated on day 2. Sepsis was suspected as the cause. However, the clinical situation did not improve under antibiotic therapy.

After diagnosis and the start of specific therapy (protein-defined diet with substitution of essential amino acids) nitrogen elimination with sodium benzoate and L-arginine, the patient developed well.

3.1.2. Scoring details

Table 1: Scoring details for case 2024-1.

	interpretation		**scores (points)**
findings, abnormalities, maximum 2 points (*has to be mentioned for 2 points)	elevated	gln, cit, met	1
	elevated*	argininosuccinic acid	1
	low	arg	1
diagnosis, maximum 2 points	argininosuccinic aciduria (ASL deficiency)		2
	citrullinemia type I (ASS deficiency)		0
	ASS and ASL deficiency		1
further tests (if molecular genetic recommended specify the gene)**, maximum 2 points**	orotic acid in urine (organic acids in urine)		1
	genetic analysis of *ASL* gene		1
	enzyme studies in erythrocytes/fibroblasts		1
comments	As the detection of argininosuccinic acid is typical for the diagnosis of ASL (argininosuccinate lyase) deficiency, other urea cycle defects are not recognised as differential diagnoses and are therefore not awarded points. In addition, the mention of molecular genetic analysis (*ASL* gene) without additional metabolite diagnostics (such as determination of orotic acid) was only awarded one point.		

Scores for participating laboratories are in APPENDIX 1 on page 7.

3.1.3. Comments on overall performance

Overall proficiency was 91%. The proficiency for further testing recommendations was lowest at 87%. The most common reason for points being deducted in this section of the assessment was that the only recommendation was molecular genetic testing. Other tests, in particular metabolite diagnostics, were not recommended.

3.1.4. Best interpretation (scored with 2 points each)

- **Findings (*108):** Grossly elevated citrulline, glutamine and glutamate. Elevated taurine, proline, alanine, methionine, tyrosine, histidine and lysine. Low isoleucine. Detectable argininosuccinic acid.
  Note: The reported superposition of the leucine peak can be caused by the ASA anhydrides.
- **Diagnosis (*109)**: Argininosuccinic aciduria (argininosuccinate lyase (ASL) deficiency).
- **Further tests (*108):** Analyse amino acids in urine (argininosuccinic acid and its anhydrides). Determine orotic acid in urine. Mutational analysis of *ASL*-gene. ALS enzyme activity in fibroblasts or blood. If needed, exclude citrullinaemia type I and II.

3.2. Case 2024-2: Lysinuric protein intolerance (LPI)

3.2.1. Sample details

This sample is from a 5-year-old girl, admitted in general podiatry unit to explore a left ankle arthritis. She is the first child from a consanguineous family. At 10 months, her growth began to slow. She has a growth and psychomotor retardation, and autistic features were suspected. During hospitalisation, an anaemia was discovered due to a homozygous sickle cell disease. The biological work-up also revealed a hyperferritinemia and increased LDH.

After diagnosis she was treated with protein restricted diet, ammonia scavenger and citrulline. Due to persistent feeding difficulties she also had a gastrostomy.

3.2.2. Scoring details

Table 2: Scoring details for case 2024-2.

	interpretation		**scores (points)**
findings, abnormalities, maximum 2 points	increased	gln	1
	increased	cit	1
	decreased	lys, arg, orn	1
diagnosis, maximum 2 points	lysinuric protein intolerance (LPI)		2
	malnutrition		1
further tests (if molecular genetic recommended specify the gene)**, maximum 2 points**	orotic acid (organic acids) in urine		1
	amino acids in urine		1
	ammonia, ferritine, triglycerides		1
	molecular genetic analysis *SLC7A7* gene		1
comments	Really hard diagnosis (but as often for LPI), because probable malnutrition and unspecific increase of some amino acids, but "real life case".		

Scores for participating laboratories are in APPENDIX 1 on page 7.

3.2.3. Comments on overall performance

Overall proficiency was 93 %. The proficiency for diagnosis was lowest at 86 %. The main reason for a point deduction was that the low concentrations of lysine, arginine and ornithine were overlooked (when interpreting amino acid results, the eye is trained on the high concentrations).

3.2.4. Best interpretation (scored with 2 points each)

- **Findings (*41):** Decrease lysine, ornithine and arginine were noticed. Also, mild increased glutamine, serine, glycine, citrulline and threonine were found.
- **Diagnosis (*31):** Main diagnosis: Lysinuric protein intolerance (LPI), low lysine, ornithine, and arginine with increased glutamine, glycine, and citrulline most probably indicate lysinuric protein intolerance.
- **Further tests (*42):** For final diagnosis, please refer to urinary organic acid analysis result to confirm orotic acid level, urinary amino acid analysis to confirm lysine, ornithine and arginine level, genetic test result to confirm *SLC7A7* gene mutation.

3.3. Case 2024-3: P5C synthase deficiency (de Barsy syndrome)

3.3.1. Sample details

The results are from a 4 months-old boy from a non-consanguineous family. He presented an intrauterine growth retardation and joint hyperlaxity, inguinal hernia and cutis laxa at birth. At 2 months he presented a neurological deterioration with axial hypotonia, pyramidal syndrome and a cataract on the left eye was diagnosed. His growth was also severely impaired leading to naso-gastric feeding. He died at 7 months of age.

3.3.2. Scoring details

Table 3: Scoring details for case 2024-3.

	interpretation		scores (points)
findings, abnormalities, maximum 2 points	increased	glu, gln	1
	decreased	cit, arg, orn, pro	2
diagnosis, maximum 2 points	P5C synthase deficiency (de Barsy syndrome)		2
	proline metabolism abnormalities		1
	P5C reductase deficiency		0
further tests (if molecular genetic recommended specify the gene)**, maximum 2 points**	organic acids		1
	isoelectric focussing of transferrine		1
	Moleculargenetic analysis of *ALDH18A1*gene		2
	ammonia		1
comments	This is an ultrarare metabolic disorder, but with the clinical symptoms (and pubmed search) and the description of the amino acid changes, the diagnosis (full number of points) could be made. The recommendation of a molecular genetic analysis without specifying which gene was awarded one point if the diagnosis was correct. P5C reductase deficiency was not scored with points.		

Scores for participating laboratories are in APPENDIX 1 on page 7.

3.3.3. Comments on overall performance

The amino acid results for this sample were very difficult to interpret. For this reason, the overall proficiency for this case was expected to be below 80%. This was not the case. After a description of the abnormalities and a literature search, the correct diagnosis was made. The overall performance was very good at 94%, although 17 participants made an incorrect diagnosis (proficiency of this section 90%).

3.3.4. Best interpretation (scored with 2 points each)

- **Findings (*58):** Decreased levels of amino acids, specifically ornithine, arginine, citrulline, cysteine, proline, mildly elevated glutamine
- **Diagnosis (*59):** The clinical pattern with cutis laxa, joint hyperlaxity, microcephaly and hypotonia in combination with elevated glutamine as well hypoprolinemia and deficiency the urea cycle intermediates (ornithine, citrulline and arginine) is compatible with delta1-pyrroline-5-carboxylate synthase deficiency.
- **Further tests (*121):** Diagnosis should be confirmed by molecular genetic analysis of the *ALDH18A1* gene. Ammonia should be checked especially with prolonged fasting/infections.

3.4. Comments on the whole of the first circulation results 2024

We hope that we were able to provide the participants with three interesting and instructive cases. The overall proficiency of 93% was above the expected range. This is pleasing, especially in cases that are actually difficult to diagnose (such as lysinuric protein intolerance) or are very rare.

The methods used by the participants for amino acid analysis are LC-MS/MS with a share of 44% and HPLC with ninhydrin detection with a share of 37%.

Table 4: Laboratory methods for the analysis of amino acids used by the participants (139/143 participants completed this question)

Method	No of responses
LC-MS/MS	61
Ion-exchange chrom Ninhydrin 1/2 Int. Std	48
Reverse phase HPLC/UPLC with non MS detection	16
LC-MS	8
Ion-exchange chrom Ninhydrin 0 Int. Std	3
GC-FID and/or Reverse phase HPLC with Fluorimetric detection	1
Ion-exchange chrom Ninhydrin	1
LC-UV	1
Total	**139**

Table 5: Overall scores for the first circulation in the Amino Acid Interpretation scheme

	2024.01				2024.02				2024.03				2024.01 - .03
	A	D	R	Sum	A	D	R	Sum	A	D	R	Sum	Totals
Total Points	269	255	243	767	266	242	269	777	278	251	258	787	1619
% proficiency	96%	91%	87%	91%	95%	86%	96%	93%	99%	90%	92%	94%	93%

Key

A = Findings, abnormalities

D = Diagnosis

R = Recommendations for further testing

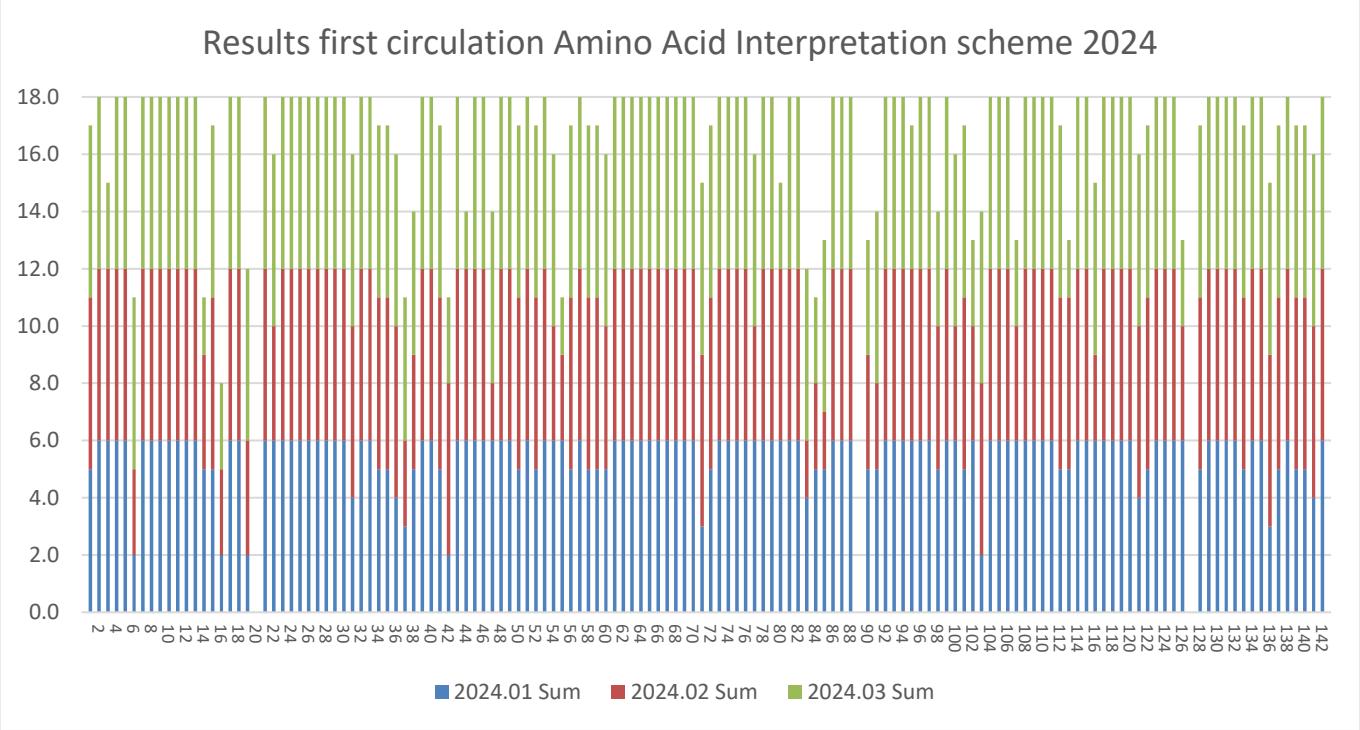

Figure 3: Detailed scores for the first circulation in the Amino Acid Interpretation scheme

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: 18th July 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 any results

Anon. lab number	2024.01				2024.02				2024.03				2024.01 - .03
	A	D	R	Sum	A	D	R	Sum	A	D	R	Sum	Total Score
1	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**
2	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**
3	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	0.0	1.0	**3.0**	**15.0**
4	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**
5	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**
6	1.0	0.0	1.0	**2.0**	2.0	0.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	**11.0**
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	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**
10	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**
11	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**
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	1.0	**5.0**	2.0	0.0	2.0	**4.0**	2.0	0.0	0.0	**2.0**	**11.0**
15	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**
16	1.0	0.0	1.0	**2.0**	1.0	0.0	2.0	**3.0**	2.0	0.0	1.0	**3.0**	**8.0**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
19	1.0	0.0	1.0	**2.0**	2.0	1.0	1.0	**4.0**	2.0	2.0	2.0	**6.0**	**12.0**
20		0.0		**0.0**				**0.0**				**0.0**	**0.0**
21	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**
22	2.0	2.0	2.0	**6.0**	1.0	1.0	2.0	**4.0**	2.0	2.0	2.0	**6.0**	**16.0**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
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	1.0	1.0	2.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
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	1.0	2.0	2.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
35	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**
36	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**
37	2.0	0.0	1.0	**3.0**	2.0	0.0	1.0	**3.0**	2.0	2.0	1.0	**5.0**	**11.0**
38	2.0	2.0	1.0	**5.0**	1.0	2.0	1.0	**4.0**	2.0	2.0	1.0	**5.0**	**14.0**

Anon. lab number	2024.01				2024.02				2024.03				2024.01 - .03
	A	D	R	Sum	A	D	R	Sum	A	D	R	Sum	Total Score
39	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**
40	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**
41	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**
42	1.0	0.0	1.0	**2.0**	2.0	2.0	2.0	**6.0**	2.0	0.0	1.0	**3.0**	**11.0**
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	0.0	0.0	**2.0**	**14.0**
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**	1.0	0.0	1.0	**2.0**	2.0	2.0	2.0	**6.0**	**14.0**
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	1.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
51	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**
52	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**
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	0.0	2.0	**4.0**	2.0	2.0	2.0	**6.0**	**16.0**
55	2.0	2.0	2.0	**6.0**	2.0	0.0	1.0	**3.0**	2.0	0.0	0.0	**2.0**	**11.0**
56	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**
57	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**
58	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**
59	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**
60	2.0	2.0	1.0	**5.0**	1.0	2.0	2.0	**5.0**	2.0	2.0	2.0	**6.0**	**16.0**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
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	2.0	**6.0**	**18.0**
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	0.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**15.0**
72	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**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
77	2.0	2.0	2.0	**6.0**	1.0	1.0	2.0	**4.0**	2.0	2.0	2.0	**6.0**	**16.0**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
80	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	0.0	1.0	**3.0**	**15.0**
81	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**
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	2.0	0.0	**4.0**	1.0	0.0	1.0	**2.0**	2.0	2.0	2.0	**6.0**	**12.0**

Anon. lab number	2024.01				2024.02				2024.03				2024.01 - .03
	A	D	R	Sum	A	D	R	Sum	A	D	R	Sum	Total Score
84	2.0	2.0	1.0	**5.0**	1.0	0.0	2.0	**3.0**	2.0	0.0	1.0	**3.0**	**11.0**
85	2.0	2.0	1.0	**5.0**	1.0	0.0	1.0	**2.0**	2.0	2.0	2.0	**6.0**	**13.0**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
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													**DNS**
90	2.0	1.0	2.0	**5.0**	2.0	0.0	2.0	**4.0**	2.0	0.0	2.0	**4.0**	**13.0**
91	2.0	1.0	2.0	**5.0**	2.0	0.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	**14.0**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
95	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	1.0	2.0	**5.0**	**17.0**
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	2.0	2.0	1.0	**5.0**	1.0	2.0	2.0	**5.0**	2.0	2.0	0.0	**4.0**	**14.0**
99	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**
100	2.0	2.0	2.0	**6.0**	2.0	0.0	2.0	**4.0**	2.0	2.0	2.0	**6.0**	**16.0**
101	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**
102	2.0	2.0	2.0	**6.0**	2.0	0.0	2.0	**4.0**	2.0	0.0	1.0	**3.0**	**13.0**
103	1.0	0.0	1.0	**2.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**14.0**
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	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
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	2.0	2.0	2.0	**6.0**	1.0	1.0	2.0	**4.0**	2.0	0.0	1.0	**3.0**	**13.0**
108	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**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
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	1.0	2.0	2.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
113	2.0	2.0	1.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	0.0	0.0	**2.0**	**13.0**
114	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**
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	2.0	2.0	**6.0**	1.0	0.0	2.0	**3.0**	2.0	2.0	2.0	**6.0**	**15.0**
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	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**18.0**
120	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**
121	2.0	2.0	0.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
122	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**
123	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**
124	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**
125	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**
126	2.0	2.0	2.0	**6.0**	2.0	0.0	2.0	**4.0**	2.0	0.0	1.0	**3.0**	**13.0**
127													**DNS**
128	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**

Anon. lab number	2024.01				2024.02				2024.03				2024.01 - .03
	A	D	R	Sum	A	D	R	Sum	A	D	R	Sum	Total Score
129	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**
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	1.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
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	0.0	1.0	**3.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**15.0**
137	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**
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	1.0	2.0	2.0	**5.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**17.0**
140	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**
141	2.0	2.0	0.0	**4.0**	2.0	2.0	2.0	**6.0**	2.0	2.0	2.0	**6.0**	**16.0**
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	18 July 2024	• 2024 first round interim report published

END OF REPORT