Explanation Reports
-Individual Lab Annual Report: lay-out and underlying statistics-

1. Quantitative part

Explanation of the numbers

Outlyers (results exceeding the mean +/- 7SD) are removed before the calculations.

The first column lists all analytes in the scheme.

Column 2 deals with **accuracy**: you can see your mean outcome in that year in comparison to the mean of all labs.

The third column deals with **precision**. From the four hidden duplicates the CV is calculated according to:

$$CV = \frac{\sqrt{\frac{\sum(\Delta)^2}{n}}}{\bar{x}\sqrt{2}} \times 100\%$$

CV = Coefficient of Variation
Δ = Difference in the duplicate
n = number of duplicates
$\bar{x}$ = mean of results

Again the lab's precision is compared with the median CV of other labs (precision of your lab and of all labs, respectively).

Column 4 deals with the **linearity**. For each laboratory the coefficient of regression r is calculated with the weighed amounts on the x-axis and the submitted results on the y-axis. The lab's r and the median r of all labs are listed.

Column 5 deals with the **recovery**. Linearity calculation in column 4 also revealed the relation y = ax + b between submitted results (y) and weighed amounts (x). The slope a is multiplied with 100% and is the recovery of weighed amounts. Again recovery of the lab and the median recovery of all labs is encountered.

The last column shows general data of all labs: the number of labs who submitted results (n) and the **Interlab CV** calculated according to

$$Interlab\,CV = \frac{\sqrt{\frac{\sum SD^2}{n}}}{\bar{x}}$$

CV = Interlab CV in the respective specimens of the cycle

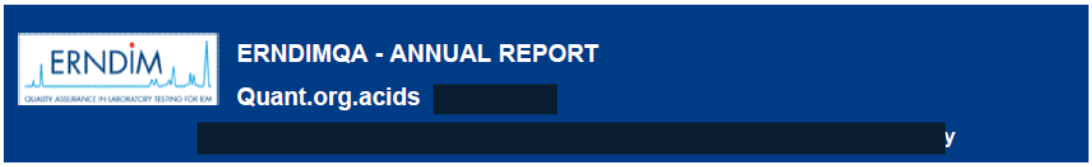
SD = standard deviation
n = number of specimens in a cycle

x = mean of results

The Interlab CV is an indication of the state of the art of harmonisation of results between labs and as such an indication how urgent efforts to achieve better standardisation are needed.

Flags Analytical Parameters
In the annual report (below) the four analytical parameters accuracy – precision – linearity – recovery are shown. Parameters that can not be calculated are marked with a flag:

- No results submitted: empty white box (example: Malic acid)
- Few Results (defined as <6 out of 8 results): **FR** in a white box (Mevalonic acid)
- Outlying Results (defined as 2 or more outliers): **OR** in a purple box (Glycolic acid)
- Outlying Results & Few Results (defined as <6 results from which at least one an outlier): **ORFR** in a yellow box (Ethylmalonic acid)
- Missing Pair (defined as the situation in which both results of a samplepair are missing or an outlier): **MP** in an amber box (Adipic acid)
- A red flags marks a result in the category “5% worst performances of all labs”. Numeric result in a red box (Suberic acid).



Methodset : GC-MS

	Accuracy (mean)		Precision (CV% duplicates)		Linearity (r)		Recovery (%added analyte)		Data All Labs	
Analyte	Your Lab	All Labs	Your Lab	All Labs	Your Lab	All Labs	Your Lab	All Labs	n	Interlab CV
2-OH Glutaric acid	MP	152	32.0%	20.8%	0.877	0.980	89%	93%	77	35.6%
3 methylglutaric acid	MP	70.4	26.3%	15.0%	0.914	0.985	117%	101%	77	23.6%
3-OH-3 methylglutaric acid	FR	66.9	FR	24.7%	FR	0.983	FR	77%	65	62.4%
3-OH-Isobutyric acid	OR	136	OR	20.4%	OR	0.979	OR	71%	53	37.0%
3-OH-Isovaleric acid	FR	78.1	FR	39.3%	FR	0.940	FR	112%	73	55.5%
4-OH-Butyric acid	FR	72.8	FR	31.2%	FR	0.982	FR	70%	63	56.7%
Adipic acid	MP	178	31.6%	12.6%	0.950	0.993	85%	101%	85	26.4%
Creatinine		3258		3.4%		0.000		0%	67	5.25%
D,L- Glyceric acid	FR	278	FR	22.0%	FR	0.985	FR	83%	64	47.0%
Ethylmalonic acid	ORFR	50.0	ORFR	17.1%	ORFR	0.992	ORFR	99%	89	36.3%
Fumaric acid	MP	60.0	19.5%	14.5%	0.991	0.991	75%	100%	78	28.5%
Glutaric acid	MP	112	44.0%	13.1%	0.878	0.994	86%	101%	90	21.8%
Glycolic acid	OR	236	OR	20.6%	OR	0.963	OR	89%	77	38.0%
Hexanoylglycine	MP	17.0	29.3%	29.9%	0.949	0.950	111%	100%	64	37.2%
Keto-glutaric acid		198		21.4%		0.992		103%	73	40.1%
Malic acid		117		19.8%		0.995		81%	53	47.4%
Methylmalonic acid	305	330	31.2%	11.4%	0.995	0.996	95%	102%	104	27.6%
Mevalonic acid	FR	132	FR	21.7%	FR	0.992	FR	82%	56	46.1%
Pyroglutamic acid	353	322	61.6%	23.0%	0.879	0.980	106%	85%	73	44.2%
Sebacic acid	MP	55.4	15.2%	19.4%	0.987	0.987	91%	101%	83	35.9%
Suberic acid	123	172	11.5%	16.3%	0.992	0.990	64%	105%	84	32.4%
Tiglylglycine	MP	83.6	17.0%	24.9%	0.975	0.987	54%	85%	57	48.0%
Vanillactic acid		38.5		19.4%		0.975		98%	38	33.0%
Overall	260	270	29.0%	20.1%	0.944	0.940	88%	89%	71	37.7%

Flags Analytes
Acceptable performance of an analyte is marked with a green flag (analyte name in green box) and applies when at least 3 of the 4 analytical parameters show satisfying results:

- 4 satisfying parameters (no flags = approved): Methylmalonic acid
- 3 satisfying parameters (1 flag = approved): Tiglylglycine
- 2 satisfying parameters (2 flags = not approved): Suberic acid (2 red flags) and Glutaric acid (1 red and 1 amber flag).
- 1 satisfying parameter (3 flags = not approved): no example
- 0 satisfying parameters (4 flags = not approved): Glycolic acid

Poor Performance
The poor performance policy of ERNDIM is based on the number of flags for the analytical parameters in the annual report. The scientific advisor of the scheme sends a Performance Support letter to the laboratories with the highest number of flags.

2. Interpretation part (if available)

The first column in the Table shows the **sample numbers**.

The second column shows the correct **interpretations** for each sample.

The column "**YourScore**" gives the points per sample received for a correct answer. A "zero" tells you that you have chosen the other correct interpretation (in case there are more then one correct answers). When a box is empty then you did not save an interpretation for the particular sample.
An amber box tells you that your result is classified as a Critical Error

N is the total **number labs** who saved results.

The fifth column shows the **percentage correct answers** given by all labs.

The sixth column shows the **Average Score**, i.e. the total score of all labs divided by the total number of saved results.

At the last column "**CE***" appears when the Scientific Advisor, together with the members of the SAB Meeting, decided your results is a Critical Error.

At the row **Total / Mean** you see your total score and the mean of all labs of n, %Correct Score and Average Score.

Satisfactory Performance is Yes when the ratio of your score/maximum achievable score meets the criteria and you do not have a critical error (amber). Satisfactory Performance is No when the ratio your score/ maximum achievable score does not meet the criteria and/or you have critical error (amber)

			All Labs			
Sample	Correct Interpretation	Your Score	N	% Correct Score	Average Score	
2022.01	Not consistent with nephropathic cystinosis		35	86	1.71	
2022.02	Consistent with ocular cystinosis	0	35	49	1.83	
2022.02	Consistent with carrier status	0	35	43	1.83	
2022.03	Consistent with ocular cystinosis	0	37	97	1.95	CE*
2022.04	Cystine concentration above therapeutic target	2	36	100	2.00	
2022.05	Not consistent with nephropathic cystinosis		35	97	1.94	
2022.06	Consistent with nephropathic cystinosis	2	37	100	2.00	
2022.07	Consistent with intermediate (late-onset) cystinosis		33	91	1.82	
2022.08	Cystine concentration within therapeutic target	2	36	83	1.67	
	Total / Mean	**6**	**35**	**83**	**1.86**	
	Satisfactory Performance	**No**				
*CE = Critical Error						

3. Scheme Annual Report (AR)

Full anonymised scheme results are included in the Annual Report. The AR can be found when you click at “Open” at the bottom of the report, you will be directed to the “Meetings & Reports” page of www.erndim.org.