UniversitätsKlinikum Heidelberg

Universitätsklinik für Kinder- und Jugendmedizin
Stoffwechselzentrum Heidelberg Stoffwechsellabor
Im Neuenheimer Feld 153 | 69120 Heidelberg

Stoffwechselzentrum Heidelberg
Stoffwechsellabor

Kinderheilkunde I
(Schwerpunkt: Allgemeine Pädiatrie, Stoffwechsel, Gastroenterologie u. Nephrologie)
Prof. Dr. med. G.F. Hoffmann
Ärztl. Direktor

Universitätsklinik für Kinder- und Jugendmedizin

ERNDIM QA Scheme for qualitative urinary organic acid analysis

Annual Report 2005

Participation

The geographical distributions of the active participants in 2005 are shown in Table 1. Sheffield and Heidelberg participate in each other´s scheme and the two centres work closely together under the auspices of the ERNDIM Scientific Advisory Committee.

Table 1: Geographical distribution of participants

Country	Number of laboratories	Country	Number of laboratories
Austria	3	Poland	1
Belgium	1	Saudi Arabia	2
Canada	5	Slovakia	1
Croatia	1	Slovenia	1
Cypres	1	Spain	1
Czech Republic	2	Sweden	2
Denmark	1	Switzerland	3
Germany	10	The Netherlands	8
Italy	10	Turkey	1
Norway	1	United Kingdom	1
Philippines	1	USA	10

Im Neuenheimer Feld 153
69120 Heidelberg
Stoffwechsellabor:
Fon +49 (0)6221 56 8276
8423
Fax +49 (0)6221 56 5565
Stoffwechselklinik und -ambulanz:
Fon +49 (0)6221 56 2319 (Anmeldung)
2311 (Information)
Neugeborenenscreening:
Fon +49 (0)6221 56 8278

stoffwechsellabor@uni-hd.de
www.stoffwechsel.uni-hd.de

Samples and results

Three sets of three samples (total 9; sample number 133 --141) were distributed to 67 laboratories.

59 laboratories returned results at least to the first and second circulation. Two laboratories responded only to the first respectively to the second circulation. Three participants did not answer to any of the three circulations.

Table 2: Receipt of results

Circulation	Number of returns
1. circulation	60 (90%)
2. circulation	61 (91%)
3. circulation	55 (82%)

Shipment of the samples

As the years before we sent out the samples for all three circulations together. This is only for organisation reasons and keep the costs for participating in this scheme as low as possible. Some laboratories reported all three circulations together. **The idea of the scheme is to measure the samples evenly spread over the year and report the results near the closing date!**

Table 3: Distribution of scores for individual samples (laboratories making returns)

		-2	0	1	2
Sample 133	Normal pattern	2	0	1	57
Sample 134	succinic semialdehyde dehydrogenase def. (SSADH def.)	3	0	0	57
Sample 135	Maple syrup urine disease (MSUD)	0	0	9	51
Sample 136	3-methylcrotonyl-CoA carboxylase def.	5	17	3	36
Sample 137	Methylmalonic aciduria	1	0	0	60
Sample 138	Normal pattern	0	0	0	61
Sample 139	Normal pattern	2	0	0	53
Sample 140	3-hydroxy-3-methylglutaryl CoA lyase def. (3-HMG CoA lyase def.)	1	0	2	52
Sample 141	Normal pattern	0	0	0	55

Scoring scheme

Individual returns for each sample were scored on the scale

2	Correct/satisfactory
1	helpful but incomplete
0	unhelpful
-2	misleading

Most active laboratories diagnosed all five samples correctly.
M**ethylmalonic aciduria** was correctly diagnosed by nearly all senders reflecting to the unproblematic detection of *methylmalonic acid* and *methylcitric acid*.

4-hydroxybutyric acid, the key metabolite for **succinic semialdehyde dehydrogenase (SSADH) deficiency**, was identified in the urine samples by the majority of laboratories.
Only three participants reported normal findings. These findings seemed to be due to incomplete extraction which may result only in a small peak which can be covered by a large urea peak.

Maple syrup urine disease (MSUD) was correctly diagnosed by most participants due to an elevation of branched-chain oxo- and hydroxyacids like *2-hydroxy-isovaleric acid* and *2-oxo-isocaproic acid*.

All laboratories sending results also had no problems in identifying the methylbranched acids *3-hydroxy-3-methylglutaric acid*, *3-methylglutaconic acid*, *3-hydroxyisovaleric acid*, *3-methylglutaric acid* and *3-methylcrotonylglycine* and **3-hydroxy-3-methylglutaryl CoA lyase deficiency (3-HMG-CoA lyase deficiency)** was diagnosed by nearly all participants. The underestimation of 3-hydroxy-3-methylglutaric acid lead in some cases to the diagnosis of 3-methylglutaconic aciduria.

The interpretation of the analytical findings for the sample from the patient with **3-methylcrotonyl glycinuria (3-methylcrotonyl-CoA carboxylase deficiency, 3-MCG)** caused obviously some problems .
The small amounts of *3-methylcrotonylglycine* present in this sample could easily be overlooked and the overestimation of other organic acids like *3-hydroxypropionic acid*, *lactate*, *methylcitrate* or *tiglylglycine* often resulted in alternative diagnosis like multiple carboxylase deficiency or biotinidase deficiency.
The control urines from healthy subjects were correctly diagnosed as normal by nearly all participants. Only 4 respondents reported pathological findings for two of the four controls.

Comments on performance

The participants cumulative scores are shown in diagram 1 and in table 4. Cumulative scores are the scores for the whole year 2005. Twenty-five participants (37%) got full marks!
The poor performance of some laboratories scoring less than 10 this year is due to missing returns. Three laboratories returned no results, eight laboratories send only results for two of the circulations

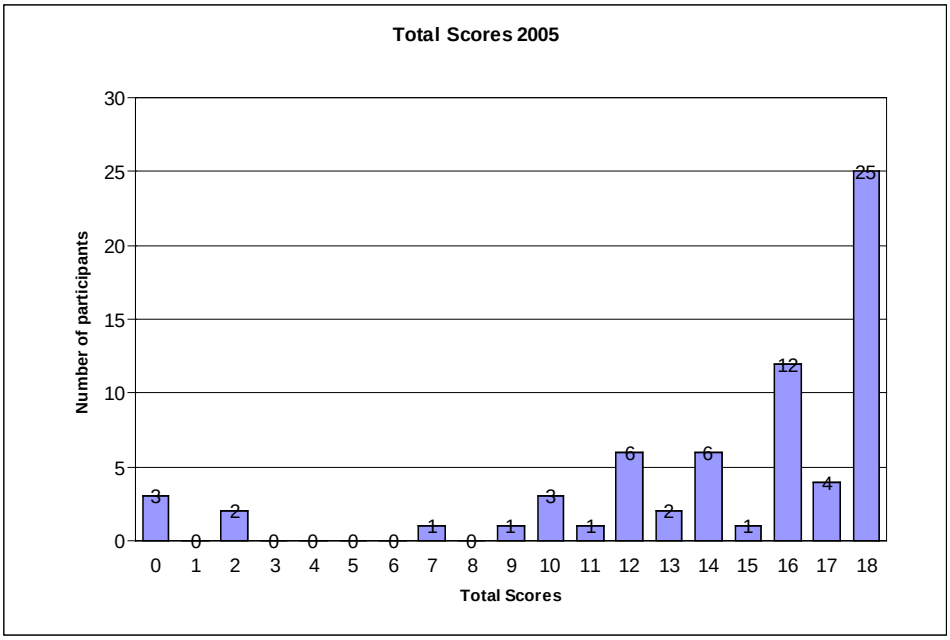

Diagram 1: Total scores 2005

stoffwechsellabor@uni-hd.de
www.stoffwechsel.uni-hd.de

Table 4: total scores 2005

Cumulative scores	Number of laboratories	Cumulative scores	Number of laboratories
18	25	**8**	0
17	4	**7**	1
16	12	**6**	0
15	1	**5**	0
14	6	**4**	0
13	2	**3**	0
12	6	**2**	2
11	1	**1**	0
10	3	**0**	3
9	1		

Your total score 2005

Your total score for 2005 was: **12**

General comments

Special thank for the laboratories that supported us last year with samples. This is critical for the success of the program and will keep the scheme interesting. **It is most appreciated that you will continue to support us with urine from patients. Please send us at least 250 ml urine of any interesting patients you may have. We will cover the costs.**

Yours sincerely,

Dr. C. D. Langhans

Laboratory of Metabolic Diseases

Dr. V. Peters

Laboratory of Metabolic Diseases

Prof. Dr. G. F. Hoffmann

Director
Department of General Paediatrics

stoffwechsellabor@uni-hd.de
www.stoffwechsel.uni-hd.de