ERNDIM DPT Center Eastern Europe

Institute of Inherited Metabolic Diseases
General Faculty Hospital
and
Charles University 1st Faculty of Medicine
Ke Karlovu 2, 128 08 Prague 2, Czech Republic
phone: ++420/224 967 694, 224 967 679
fax: ++420/224 967 081 or 224 919 392

Proficiency Testing Centre Eastern Europe: Annual Report 2005

1. Introduction

In 2005 proficiency testing in our centre was running as a regular ERNDIM scheme.

2. Geographical distribution of participants

Twenty-four laboratories from 15 countries have participated in our DPT scheme in 2005, for details see the below table:

Country	Number of participants
Austria	3
Croatia	1
Cyprus	1
Czech Republic	1
Denmark	1
Finland	1
France	1
Germany	5
Greece	1
Latvia	1
Malaysia	1
Poland	1
Slovakia	2
Switzerland	3
Turkey	1
in total	**24**

3. Logistics of the scheme

- ✓ Two surveys: 2005/1 – samples A, B and C
  2005/2 – samples D, E and F
- ✓ Origin of samples: Five urines obtained from patients with known diagnoses (samples were provided by the DPTC participants and by the organizers) + a common sample from DPT Centre Southern Europe (distributed in all four DPT schemes); aall samples have been reanalyzed in our lab after heat-treatment, diagnostically relevant metabolites were detected in all six samples after 3-day incubation at RT.

- ✓ The organizers acknowledge Drs. Elena Gregová and Jeanette Klein for providing samples for 2005 surveys.
- ✓ Shipment of samples: Six heat-treated urines were shipped at once by express courier service together with results protocols. Samples were shipped at ambient temperature.
- ✓ The following protocol for heat inactivation is being used: 1. Add thiomersal 100 mg/l of urine; 2. Heat urine to 56°C for one hour in water bath. Make sure that this temperature is achieved in the entire urine sample, not only in the water bath. The urinary samples have to be frozen until shipment.
- ✓ Tests required in 2005: amino acids, organic acids, mucopolysaccharides, oligosaccharides and purines/pyrimidines

4. Schedule of the scheme in 2005

Sample distribution	March 14
Start of analysis of Survey 2005/1	March 21
Survey 2005/1 – results submission	April 8
Survey 2005/1 – report	May 6
Start of analysis of Survey 2005/2	May 30
Survey 2005/2 – results submission	June 20
Survey 2005/2 – report	August 5
Annual meeting of the participants	September 6
Annual report 2005	December 31

5. The receipt of samples and results

Date of receipt of samples (samples sent on March 14, 2005)

Date of receipt (reported by participants)	Number of participants	Date of receipt (reported by courier service)	Number of participants
1 day	8	1 day	14
2 days	8	2 days	8
4 days	1	3 days	2
not indicated	7	-	-

As in previous years we used courier service Pegasus Express for samples distribution, the service seems to be reliable.

Deadlines of the results submission

	2005/1	2005/2
in time	23	24
3 days delay	1	-

6. Scoring of results

Three criteria are being evaluated: analytical, interpretative and recommendations for further investigations. Due to the large variability in reporting results in various countries recommendations to treatment are not evaluated in proficiency testing, however, they are still reported and summarized by the scheme organizers.

A	Analytical performance	Correct results of the appropriate tests	2
		Partially correct or non-standard methods	1
		Unsatisfactory or misleading	0
I	Interpretative proficiency	Good (diagnosis was established)	2
		Helpful but incomplete	1
		Misleading/wrong diagnosis	0
R	Recommendations	Helpful	1
		Unsatisfactory or misleading	0

The total score was calculated as a sum of these three criteria. The maximum that can be achieved is 5 points per sample, i.e. 15 points per survey and 30 points per year.

7. Score of participants for individual samples

Survey 2005/1

Lab no	Sample A Canavan disease				Sample B COX deficiency				Sample C PKU			
	A	**I**	**R**	**Total**	**A**	**I**	**R**	**Total**	**A**	**I**	**R**	**Total**
301	2	2	1	**5**	1	0	1	**2**	2	2	1	**5**
302	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
303	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
304	2	2	1	**5**	2	2	0	**4**	2	2	1	**5**
305	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
306	0	0	0	**0**	2	2	0	**4**	2	2	1	**5**
307	2	2	1	**5**	2	1	1	**4**	2	2	1	**5**
308	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
309	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
310	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
311	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
312	2	2	1	**5**	1	2	1	**4**	2	2	1	**5**
313	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
314	2	2	1	**5**	2	1	1	**4**	2	2	1	**5**
315	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
316	2	2	1	**5**	2	1	1	**4**	2	2	1	**5**
317	2	2	1	**5**	1	2	1	**4**	2	2	1	**5**
318	2	2	1	**5**	2	2	0	**4**	2	2	1	**5**
319	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
320	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
321	2	2	1	**5**	2	2	0	**4**	2	2	1	**5**
322	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
323	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
324	0	0	0	**0**	2	2	0	**4**	2	2	0	**4**

Survey 2005/2

Lab no	Sample D MPS II				Sample E Propionic acidemia				Sample F Tyrosinemia II			
	A	**I**	**R**	**Total**	**A**	**I**	**R**	**Total**	**A**	**I**	**R**	**Total**
301	2	2	1	**5**	2	2	0	**4**	1	2	1	**4**
302	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
303	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
304	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
305	1	1	0	**2**	2	2	1	**5**	2	2	1	**5**
306	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
307	1	1	1	**3**	2	2	1	**5**	2	2	1	**5**
308	1	1	1	**3**	2	2	1	**5**	1	2	1	**4**
309	0	1	1	**2**	2	2	1	**5**	2	2	1	**5**
310	1	1	0	**2**	2	2	1	**5**	1	2	1	**4**
311	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
312	1	1	0	**2**	2	2	1	**5**	1	2	1	**4**
313	1	2	1	**4**	2	2	1	**5**	1	2	1	**4**
314	2	1	0	**3**	2	2	1	**5**	2	2	1	**5**
315	2	2	1	**5**	2	2	1	**5**	1	2	1	**4**
316	1	2	1	**4**	2	2	1	**5**	2	2	1	**5**
317	1	1	1	**3**	2	2	1	**5**	2	2	1	**5**
318	0	0	0	**0**	2	2	1	**5**	1	2	1	**4**
319	2	1	1	**4**	2	2	1	**5**	2	2	1	**5**
320	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
321	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
322	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
323	2	2	1	**5**	2	2	1	**5**	2	2	1	**5**
324	1	1	1	**3**	1	2	1	**4**	1	2	1	**4**

8. Total score of participants for individual surveys and their performance in 2005

Lab no	2005/1 [points]	2005/2 [points]	Total point 2005
301	12	13	**25**
302	15	15	**30**
303	15	15	**30**
304	14	15	**29**
305	15	12	**27**
306	9	15	**24**
307	14	13	**27**
308	15	12	**27**
309	15	12	**27**
310	15	11	**26**
311	15	15	**30**
312	14	11	**25**
313	15	13	**28**
314	14	13	**27**
315	15	14	**29**
316	14	14	**28**
317	14	13	**27**

318	14	9	**23**
319	15	14	**29**
320	15	15	**30**
321	14	15	**29**
322	15	15	**30**
323	15	15	**30**
324	8	11	**19**

9. Poor performers

A consensus on the borderline between good and poor performance within ERNDIM has been reached last year. The Scientific Advisory Board of ERNDIM suggested that 50% performance should be still considered satisfactory. The participants who obtained 14 points or less (< 50%) within the calendar year are assumed to be poor performers. There was no poor performer in our DPT centre in 2005 and almost all participants have achieved proficiency higher than 75%.

10. Annual meeting of the participants

The annual meeting of participants of the Proficiency Test Centre Eastern Europe took place during the 42nd Annual Symposium of SSIEM in Paris on 6th September 2005. The meeting was followed by ERNDIM joint DPTC meeting. The following items were discussed during the annual meeting of our DPT centre:

- ✓ **Scoring**

With the exception of sample 2005 D there were no disagreements on scoring between organizers and participants. Scoring of sample 2005 D was thoroughly discussed at the meeting. It was agreed that evaluation of GAG fractions by TLC or electrophoresis was the crucial method. Thus the consensus criteria for good analytical performance were as follows: report of elevated dermatan sulphate was scored 2 points while reporting of an abnormal pattern without its specification or interpretation not including MPS II was scored by one point. Analytical performance for sample 2005 D was subsequently re-evaluated using these new criteria and the final scoring of individual participants did not change.

- ✓ **Bacterial contamination of samples**

Distribution of the bacterial contaminated and possibly decomposed urines in DPT Scheme is a continuous problem. Contamination should be prevented although it may be hard to achieve. The quality of the samples distributed this year has improved; nitrites were not detected in any urinary sample.

- ✓ **Analysis of GAG profile**

Discussion revealed that failure to diagnose properly mucopolysaccharidoses results from the absence of techniques for determination of GAG pattern in many participating laboratories (thin layer chromatography or electrophoresis). These techniques were discussed and protocols were distributed during 2004 Annual meeting of the DPT centre.

- ✓ **Contribution of samples**

Please, note that DPT schemes cannot run without cooperation with participants and that each participant of the Scheme is obliged to contribute one urinary sample every year. To avoid a possible multiplicity of some common diagnoses, please, send the samples only after prior arrangement with the scheme organizers. At least 250-300 ml of urine is needed for distribution in the DPT Centre Eastern Europe, for samples with low creatinine (below 1 – 1.5 mmol/l) 500-600 ml should be collected. Once every 4 years our DPT Centre is obliged to contribute at least 1200 ml of urine (2400 ml for diluted samples), which is than distributed as a common sample in all 4 DPT Centres. Send the heat-treated urine at ambient temperature together with a short clinical

information (as given by the clinician when the sample was first referred for metabolic investigation), with current treatment and age when the sample was collected, and with comments on the confirmatory diagnostic tests.

- ✓ **Individual samples in 2005**

Only one sample in 2005 was found difficult. Urine D from a patient with mucopolysaccharidosis type II was a rather problematic sample due to lack of laboratory technique for MPS qualitative pattern determination in some participating laboratories. In some countries enzymatic assays are directly done without previous MPS pattern characterization.

- ✓ **"Difficult" and "easy" samples ratio**

Score summary in 2005

Sample	Diagnosis	Analytical [%]	Interpretative [%]	Recommen-dations [%]	Total [%]
A	***Canavan disease***	92	92	92	92
B	***Mitochondrial disease (COX deficiency)***	94	90	79	89
C	***PKU***	100	100	96	99
D	***Mucopolysaccharidosis type II***	73	75	79	75
E	***Propionic acidemia***	98	100	96	98
F	***Tyrosinemia type II***	83	100	100	93

"Easy" and "difficult" control samples were included in the surveys. The analytical and interpretative performance was very good for some diagnoses (e.g. Canavan disease, phenylketonuria, propionic acidemia and tyrosinemia type II), and surprisingly good results were obtained for urine from a patient with COX deficiency. Unfortunately diagnostic proficiency for mucopolysaccharidoses remains a continuous problem.

- ✓ **Dispersion of quantitative analyses**

As in previous surveys large discrepancies among values of many metabolites were presents.

- There was very large dispersion of urinary creatinine results; surprising data for an analyte where standardised methods, calibrators and QC schemes exist.
- There was an excessive dispersion of results in urinary organic acids with differences up to two orders of magnitude; e.g. N-Acetylaspartic acid in sample A and 3-OH-propionic acid in sample E.
- Also very large dispersion of quantitative results of glycosaminoglycans in sample D was present.
- The participants achieved satisfactory dispersion of results in amino acids determination; phenylalanine in sample C and tyrosine in sample F.

- ✓ **Submission of the results on-line via a web**

The organizers presented a suggestion of results submission via a web. The participants considered the web-based reporting as useful.

11. Tentative schedule of DPT scheme and fee in 2006

Sample distribution	March 13, Monday
Start of analysis of Survey 2006/1	March 20, Monday
Survey 2006/1 – results submission	April 7, Friday
Survey 2006/1 – report	May 5, Friday
Start of analysis of Survey 2006/2	May 29, Monday
Survey 2006/2 – results submission	June 19, Monday
Survey 2006/2 – report	August 4, Friday
Annual meeting of the participants	September-October
Annual report 2006	December

It is not definite where the next annual meeting will be held. SSIEM symposium will not go on next year and it is not suitable for many participants to participate in ICIEM in Japan. So two possible places for the meeting were suggested; the annual meeting of the participants of all DPT schemes and joint ERNDIM meeting can take place in autumn in Prague or Paris. The date and place of the meeting will be specified in due course.

The Executive Board of ERNDIM determined1 the fee for 2006 in the amount of 276 €.

12. Certificate of participation in Proficiency Testing for 2005

The certificate of participation will be provided by the ERNDIM to all participants, who returned the results of both surveys.

Please, note that our fax number has been changed to +420/224 967 081.

Prague, December 30, 2005

Viktor Kožich, MD, PhD
Scientific Advisor to the Scheme
vkozich@lf1.cuni.cz

Evženie Pospíšilová, M.Sc.
Scheme Organizer
eposp@lf1.cuni.cz