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Center for Metabolic Diseases Heidelberg
Metabolic Laboratory
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Germany

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University Hospital Heidelberg

University Children's Hospital
Department of General Pediatrics
General Pediatrics, Metabolism, Gastroenterology, Nephrology

Chairman of Pediatrics
Prof. Dr. med. Prof. h. c. (RCH)
Georg F. Hoffmann

Request form Metabolic Laboratory

Patient data (block letters)

Name

First name

Date of birth ___.___.___

☐ f ☐ m

Patient ID-No.

Your lab No.

Billing address

ward

Clinical information/diagnostic indications (essential for interpretation of test results!)

Medicine/infusions ☐ no ☐ yes (details essential!), which one:

Special diet ☐ no ☐ yes (medium-chain triglycerides: ☐ no ☐ yes)

Medical history

Birth _____ weeks of gestation
symptomatic from _____
Day/week/month/year of life

yes	no	
☐	☐	Consanguinity
☐	☐	Dystrophy at birth
☐	☐	SIDS or unsolved illness

In siblings:

General findings

yes	no	
☐	☐	Acute metabolic decompensation
☐	☐	Severe general illness
☐	☐	Coma or encephalitis
☐	☐	Cerebral hemorrhage
☐	☐	Psychomotor retardation
☐	☐	Progressive deterioration
☐	☐	Residual impairment
☐	☐	Failure to thrive
☐	☐	Recurrent vomiting

yes	no	
☐	☐	Hyperventilation
☐	☐	Tachycardia
☐	☐	Dysmorphy, skeletal abnormalities: _____
☐	☐	Short stature
☐	☐	Macrocephaly
☐	☐	Microcephaly
☐	☐	Abnormalities of skin/hair: _____
☐	☐	Abnormal odor
☐	☐	Photosensitivity

Organ dysfunction

yes	no	
☐	☐	Hepatopathy
☐	☐	Hepato-/splenomegaly
☐	☐	Nephropathy
☐	☐	Renal-tubular dysfunction
☐	☐	Cardiomyopathy
☐	☐	Ocular abnormalities: _____

yes	no	**Neurological Findings**
☐	☐	Seizures
☐	☐	Myoclonus
☐	☐	Muscular hypertonia
☐	☐	Muscular hypotonia
☐	☐	Ataxia, cerebellar dysfunction
☐	☐	Pyramidal signs
☐	☐	Extrapyramidal signs
☐	☐	Reflexes ↓/↑

Neuroradiological findings

yes	no	
☐	☐	Performed (MRI, CT, US mark as appropriate)
☐	☐	No pathological findings
☐	☐	White matter abnormalities
☐	☐	Grey matter abnormalities
☐	☐	Malformation/lack of gyration
☐	☐	Supratent. atrophy
☐	☐	Infratent. atrophy

yes	no	**Laboratory findings**
☐	☐	Metabolic acidosis
☐	☐	Anion gap increased
☐	☐	Anaemia
☐	☐	Pancytopenia
☐	☐	Hypoglycaemia
		Level: _____ mmol/l
☐	☐	Lactic acidaemia
		Level: _____ mmol/l
☐	☐	Hyperammonaemia
		Level: _____ µmol/l
☐	☐	CK elevated
☐	☐	AST/ALT elevated
☐	☐	Creatinine elevated/decreased

Miscellaneous:

Sender (name, full postal address)

Name of referring physician (print name)
Phone

Date and signature

KIND 232.09.03.14 RIECO ☏ (0 63 59) 93 40 - 0

6845449910

Sample data

Sample type and data: date (ddmmyy) time (hrmin)

- Spot urine: ,
- EDTA-plasma: ,
- Serum: ,
- Dried blood spot: ,
- CSF: ,
- NH4-heparinized blood*:
- 24-hrs-urine: Duration of collection: hrs Volume: ml
- Body weight kg
- Body length: cm
- Last meal before hrs
- Perchloric acid extraction: ,

for analysis of neurotransmitters see below!

- Skin biopsy*/ Fibroblasts*: Cultivation of fibroblasts (skin biopsy) includes cryoconservation and mycoplasma testing

Requests

Specific details for neurotransmitter diagnostics: please provide exact sample data!

CSF should be frozen immediately during spinal tap (-70°C). In case of blood contamination, centrifuge immediately and freeze the supernatant!

- lumbar _____ (specify type of puncture) blood-stained? centrifuged xanthochrome

CSF fractions **(0.5 ml each):** (your lab) 2. 3. 4. 5.

please send fractions 2 - 5. Collect 4th fraction for pterins (BH4) in a special tube (special tubes on request)

Requests:

- Basic investigations: biogenic amines (CSF)[8], 5-MTHF (CSF)[8], pterins incl. BH4 + BH2 (CSF)[8, 10] and amino acids (CSF[8]+ P[8, 16])
- Biogenic amines (CSF)[8]
- 5MTHF (CSF)[8]
- pterins (CSF)[8, 10]
- Serotonin (EDTA-blood; special tube: 2 ml EDTA-blood + 6 mg ascorbic acid)[8]
- GTPCH activity/Segawa syndrome (SB/F) [13, 14]*
- Aromatic L-amino acid decarboxylase (AADC) activity (P)[3, 8]*
- Vanillactic acid (U)[1, 9]

Differential diagnosis of BH4 deficiencies (requests):

- Pterins and DHPR activity (DBS)[11, 12]*
- Pterins (U)[1, 8, 10 or 14] and DHPR activity (DBS)[11, 12]*
- DHPR activity (DBS)[11, 12]*
- Loading test with BH4 (Kuvan)
- Loading test with Phe+BH4 (Kuvan)

Blood Phe: Basal_____ T0_____ T8_____ T24_____ T__ _____

Requested investigations (phone: ++49 62 21 56 82 76)

- **Basic investigations:** organic acids (U)[1, 9] aminoacids (P)[2, 7, 16] acylcarnitines (DBS)[11, 12,] glycosaminoglycans (U)[1, 9] simple metabolic tests (U)[1, 9]
- **Basic investigations + additional investigations according to clinical picture** *(urine, plasma, serum, dried blood spot)*

Requests:

- Organic acids (U)[1, 9] (total profile)

Organic acids (stable isotopes)

- Methylmalonic acid (MMA) (U)[1, 9]
- Mevalonic acid (MVA) (U)[1, 9]
- 3-Hydroxy-glutaric acid+glutaric acid (GA) (U)[1, 9]
- Methylmalonic acid (MMA) (P)[2, 7]
- 3-Hydroxy-glutaric acid + (GA) (P)[2, 7]

- Amino acids (quantitative) (P)[2, 7, 16]
- Amino acids (quantitative) (CSF)[4, 8]
- Amino acids (qualitative) (U)[1, 9]
- Amino acids (quantitative) (U)[1, 9]
- Acylcarnitine profile (DBS)[11, 12]
- Acylcarnitine profile (P)[2, 7]
- Carnitine (P)[2, 7]
- L-lactate, pyruvate (perchloric acid extract)[14]
- L-lactate (NaF-P)[2, 7]
- L-lactate (CSF)[4, 8]
- L-lactate/creatinine ratio (U)[1, 9]
- D-lactate (U)[1, 9]

- Free fatty acids/ketone bodies (P)[2, 15]
- Essential fatty acids (P)[2, 7, 16]
- Homocysteine (P)[2, 7, 16]
- Orotic acid/orotidine (U)[1, 9]
- Glutathione (EDTA-blood)[3, 13, 14]
- Vitamin A, E (P)[2, 7]
- Trimethylamine (U)[1, 14]
- Total bile acids (S)[2, 7]
- Biotinidase (DBS)[11, 12]*
- Biotinidase (S)[2, 15]*
- Tyrosinaemia type I, (succinylacetone) (DBS)[11, 12]
- Sterols (P)[2, 7]
- Purines/pyrimidines (U)[1, 9]
- Galactose metabolites (DBS)[11, 12]
- Gal-1-P-uridyltransferase (DBS)[11, 12]*
- Fatty acid loading assay (SB/F)[13, 14]*

Creatine deficiency syndromes (guanidino compounds)

- Urine[1, 9]
- Plasma[2, 7]
- CSF[4, 8]

Lysosomal diagnostics

- Oligosaccharide-TLC (U)[1, 9]
- Mucopolysaccharide screening assay (MUKO) (U)[1, 9]
- Mucopolysaccharide electrophoresis (+ MUKO) (U)[1, 9]
- Neuraminic acid (U)[1, 9]
- Sulfatides (24U)[6, 9] (clinical suspicion of MLD)
- Lysos. enzymatics (Heparin. blood [5,13]/ SB/F [13,14]/DBS [11,12, 17])*

Peroxisomal disorders and B6 responsive epilepsy

- Very long chain fatty acids (VLCFA) (P)[2, 7]
- Phytanic acid (P)[2, 7]
- Plasmalogens (EDTA-blood)[3, 13]
- Pipecolic acid + 5-AASA/P6C (P)[2, 7]
- Pipecolic acid + 5-AASA/P6C (U)[1, 9]
- Pipecolic acid (CSF)[4, 8]
- Bile acid metabolites (U)[1, 9]

CDG diagnostics

- Isoelectric focusing (IEF; if transferrin abnormal + Antitrypsin) (S)[4, 7]
- Additional diagnostics after abnormal IEF see homepage

DNA-isolation possible via our cooperation with the Institute of Human Genetics Heidelberg (e-mail: humangen.diagnostik@med.uni-heidelberg.de)

Pediatric endocrinologic diagnostics (phone: ++49 6221 56 84 73)

- TSH (S)[4]
- T3 (S)[4]
- T4 (S)[4]
- FT4 (S)[4]
- TG (S)[4]
- LH (S)[4]
- FSH (S)[4]
- IGF-1 (S)[4]
- IGF-BP-3 (S)[4]
- WH (S)[4]
- Gliadin-AB, IgA (S)[4]
- Transglutaminase-AB, IgA (S)[4]

Functional tests:

- TRH (S)[12, 14]
- arginine (S)[12, 14]
- LHRH (S)[12, 14]
- LHRH-agonists (S)[12, 14]
- insulin (S)[12, 14]
- GHRH (S)[12, 14]
- IGF1-generation (S)[12, 14]
- WH-stimulation (S)[12, 14]
- WH-nightly profile (S)[12, 14]
- LH/FSH-nightly profile (S)[12, 14]

*** Informed consent mandatory according to German law § 8, Abs. 1;** not mandatory in case of therapy control of known disease

Legend for requested investigations

U	Urine	S	Serum
24U	24-hrs collected urine	F	Fibroblasts
P	EDTA-plasma	SB	Skin biopsy
NaF	sodium fluoride plasma		
CSF	Cerebrosp. fluid		
DBS	5 Dried blood spots		

1. 10 ml
2. 1 ml
3. 2 ml
4. 0.5 ml
5. 5 - 10 ml
6. 2 x 10 ml
7. if possible store sample at -20°C until shipment. Ship the frozen sample together with cool packs or similar cooling devices
8. transfer immediately onto dry ice; send on dry ice
9. conservation with 6-8 droplets of dichloromethane, shipment at ambient temperature
10. protect from light
11. allow to dry for 2 hrs at ambient temperature
12. send at ambient temperature
13. send within 24 hrs at ambient temperature
14. information for sample preparation on request
15. send on dry ice
16. 4 hrs after last meal
17. detailed list see homepage

In general EDTA-plasma, NaF plasma, serum and urine should be preferably shipped on dry ice

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UniversitätsKlinikum Heidelberg

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Informed consent

Consent form for biochemical/genetic analyses (including enzyme activities) and conservation of material and data

Patient ☐ **female** ☐ **male**	**Referring physician**
Name:	
First name:	
D.O.B.:	
Address:	
	Phone: **Fax:**

analyis/es requested

Declaration of the patient`s or his legal custodian's consent (legal) (according to German GenDG (= Genetic Diagnostics Law) - or a copy of the declaration of consent according to GenDG given to the responsible physician, respectively.

I declare that I have received a medical briefing and – where necessary – genetic counselling and that I am aware of my right to withdraw my consent to the scheduled analysis/es as well as to the necessary taking of blood or tissue samples. I give my consent to the storage of my data on paper as well as on electronic media according to the legal requirements. I also give my consent to the possible publication of my data for scientific purposes in a way where the patient identifiers are kept confidential. The results of my examinations don't need to be destroyed after 10 years, as requested by German regulations. After completion of the analysis, I assign all remaining examination materials to the laboratory that carried out the analysis, according to § 950 BGB (= German Civil Code/Law). Additionally, I give my consent to the transfer of my data – if necessary – to a billing agency for physicians for the purpose of issuing an invoice.

(Please, cross out not-applicable parts!).

Place, date **Name** (block letters) **Signature of the patient or his legal custodian**

Place, date **Name** (block letters) **Stamp and signature of the responsible physician**