

German External Quality Assessment Scheme

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Institute and Out-Patient Clinic for Occupational, Social and Environmental
Medicine of the Friedrich-Alexander University

REQUEST FORM

G-EQUAS 73 –2024

Please **order online** until **March 3rd, 2024**

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We would appreciate it very much if you could check your contact data online (www.g-equas.de). Please inform us in case the contact person or delivery address/billing address has changed.

Please note that you can only participate in G-EQUAS if we have the name of a contact partner, a valid delivery address, e-mail address and telephone number!

ORDER

Please tick the parameters that you would like to order in the current round.

**I / we are going to participate in G-EQUAS 73 and
would like to order the following control materials:**

ANALYTICAL PARAMETERS IN CONTROL BLOOD

- **3 mL control blood** (for each concentration level) are available for analysis:

Occupational exposure

Metals

(control material **1** A/B, 3mL)

- 1 Lead (Pb)
- 2 Cadmium (Cd)
- 3 Chromium (Cr)
- 4 Cobalt (Co)
- 5 Manganese (Mn)
- 6 Nickel (Ni)
- 7 Mercury (Hg)

Environmental exposure

Metals

(control material **7** A/B, 3mL)

- 70 Lead (Pb)
- 71 Cadmium (Cd)
- 72 Mercury (Hg)

General

AROMATIC AND HALOGENATED HYDROCARBONS

- To analyze the aromatic- or chlorinated hydrocarbons **1 x 2 mL or 1 x 1 mL control blood** (for each concentration level and each group of hydrocarbons) are available in gas-tight ampoules. The ampoules are offered in two different sizes due to the different headspace analysers.

Aromatic hydrocarbons in blood

(control material **4** A/B)

47 Aromatic hydrocarbons (Benzene, Toluene, Xylenes, Ethylbenzene)

For carrying out the determination I require vials with the following volume:

20 ml (Perkin Elmer HS) (2 mL blood)

10 ml (1 mL blood)

Chlorinated hydrocarbons in blood

(control material **5** A/B)

51 Chlorinated hydrocarbons (Dichloromethane, 1,2-Dichloroethane, Trichloroethene, Tetrachloroethene, 1,1,1-Trichloroethane, Tetrachloromethane, Trichloromethane)

For carrying out the determination I require vials with the following volume:

20 ml (Perkin Elmer HS) (2 mL blood)

10 ml (1 mL blood)

ANALYTICAL PARAMETERS IN CONTROL URINE

- **5 mL control urine** (for each concentration level) are available for analysis:

Occupational exposure

Metals

(control material **2** A/B, 5 mL)

8	Aluminium (Al)	25	Thallium (Tl)
9	Antimony (Sb)	206	Titanium (Ti)
10	Arsenic (by hydride technique) (As- Hydride)	26	Vanadium (V)
11	Arsenic speciation (As ³⁺ , As ⁵⁺ , MMA*, DMA*, AsB*)	27	Zinc (Zn)
15	Beryllium (Be)	29	Creatinine
16	Lead (Pb)	126	Total Arsenic (As-tot)
17	Cadmium (Cd)	141	Selenium (Se)
18	Chromium (Cr)	142	Tungsten (W)
19	Cobalt (Co)	145	Iodine compounds (as iodine) (I)
20	Fluoride (F)	159	Barium (Ba)
21	Copper (Cu)	160	Lithium (Li)
22	Manganese (Mn)	161	Molybdenum (Mo)
23	Nickel (Ni)	176	Gallium (Ga)
24	Mercury (Hg)	194	Indium (In)
		198	Tellurium (Te)
		201	Germanium (Ge)
		202	Tantal (Ta)

*MMA: Monomethylarsonic acid

*DMA: Dimethylarsinic acid

*AsB: Arsenobetaine

Environmental exposure

Metals

(control material **8** A/B, 5 mL)

- 73 Arsenic (by hydride technique) (As- Hydride)
- 74 Cadmium (Cd)
- 75 Chromium (Cr)
- 76 Nickel (Ni)
- 77 Mercury (Hg)
- 78 Platinum (Pt)
- 156 Total Arsenic (As-tot)
- 162 Calcium (Ca)
- 163 Copper (Cu)
- 164 Strontium (Sr)
- 165 Zinc (Zn)
- 190 Antimony (Sb)
- 191 Molybdenum (Mo)
- 192 Tin (Sn)
- 195 Arsenic species (As+5, As+3, MMA*, DMA*, AsB*)

*MMA: Monomethylarsonic acid

*DMA: Dimethylarsinic acid

*AsB: Arsenobetaine

General:

Solvent metabolites (including TDAA/ALA)

(control material **3** A/B, 5 mL)

- 30 Hippuric acid (HA)
- 32 Mandelic acid (MA)
- 33 Methylhippuric acids (MHA)
- 34 t,t-Muconic acid (t,t-MA)
- 37 Phenylglyoxylic acid (PGA)
- 39 Trichloroacetic acid (TCA)
- 41 2-Thio-thiazolidine-4-carboxylic acid (TTCA)
- 42 Ethoxyacetic acid (EAA)
- 43 Butoxy acetic acid (BAA)
- 44 N-Methylformamide (NMF)
- 45 2,5-Hexandione (2,5-HD)
- 46 Creatinine
- 117 N-Methylpyrrolidone metabolites (5-HNMP*, 2-HMSI*)
- 211 Thiodiacetic acid (TDAA)
- 135 Methoxyacetic acid (MAA)
- 28 δ -Aminolaevulinic acid (ALA)

*5-HNMP: 5-Hydroxy-N-methylpyrrolidone

*2-HMSI: 2-Hydroxy-N-methylsuccinimide

Amines and phenolic parameters (after hydrolysis)

(The control material is spiked with the native phenolic compounds as well as with their conjugates (glucuronides and acetates)).

- To analyse parameters **5 mL control urine** are available.

Amines parameters (after hydrolysis)

(control material **14** A/B, 5 mL in brown glass vials)

175	Aniline
134	Diisocyanate metabolites, aromatic (MDA*, 2,4-TDA*, 2,6-TDA*, 1,5-NDA*)
180	Diisocyanate metabolites, aliphatic (IPDA**, HDA**)
205	4,4'-Methylene-bis(2-chloroaniline) (MOCA)

*MDA: 4,4'-methylenedianiline

*2,4-TDA: 2,4-toluenediamine

*2,6-TDA: 2,6-toluenediamine

*1,5-NDA: 1,5-diaminonaphthalene

**IPDA: isophorone diamine

**HDA: 1,6-Hexamethylene diamine

Phenolic parameters (without phenol and o-cresol) (after hydrolysis)

(control material **15** A/B, 5 mL in brown glass vials)

79	1- Hydroxypyrene (1-HP)
86	Pentachlorophenol (PCP)
127	Naphthols (1-Naphthol, 2-Naphthol)
140	Bisphenols (Bisphenol A, Bisphenol S, Bisphenol F)
166	Trichloropyridinol (TCPy)
167	Isopropoxyphenol (IPP)
174	4-Nitrophenol
200	Triclosan (TCS)
208	Benzophenones (Benzophenone -1, Benzophenone -3)

Phenol and o-cresol (after hydrolysis)

(Control material **16** A/B, 5 mL in brown glass vials)

36	Phenol
40	o-cresol

Pesticides(control material **9** A/B, 5 mL)

- 80 Pyrethroide metabolites, acid part (Br₂-CA*, cis-Cl₂-CA*, trans-Cl₂-CA*, CTFCA*)
- 83 Pyrethroide metabolites, alcohol part (3-PBA**, FPBA**)
- 204 6-Chloronicotinic acid (6-CINA)
- 87 Alkyl phosphates*** (DMP, DMTP, DMDTP, DEP, DETP, DEDTP)
- 207 Glyphosate
- 226 Aminomethylphosphonic acid (AMPA)

*Br₂-CA : cis-3-(2,2-Dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid
 *cis-Cl₂-CA : cis-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid
 *trans-Cl₂-CA: trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid
 *CTFCA: 3-(2-Chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropane carboxylic acid

**3-PBA: 3-Phenoxybenzoic acid
 **FPBA: 4-Fluoro-3-phenoxybenzoic acid

***** Alkyl phosphates:**

DMP: Dimethylphosphate
 DMTP: Dimethylthiophosphate
 DMDTP: Dimethyldithiophosphate
 DEP: Diethylphosphate
 DETP: Diethylthiophosphate
 DEDTP: Diethyldithiophosphate

Plasticizers(control material **20** A/B, 5mL)

- 122 Phthalate metabolites "DEHP" (5-OH-MEHP*, 5-oxo-MEHP*, 5-carboxy-MEPP*, MEHP*)
- 129 Phthalate metabolites "other" (MnBP**, MiBP**, MBzP**, MEP**, OH-MiNP**, cx-MiNP**)
- 220 DINCH metabolites (7OH-MINCH***, 7oxo-MINCH***, 7cx-MINCH***)
- 223 DEHP metabolites (5OH-MEHP****, 5cx-MEHP****)

*5-OH-MEHP: Mono(2-ethyl-5-hydroxyhexyl) phthalate
 *5-oxo-MEHP: Mono(2-ethyl-5-oxohexyl)phthalate
 *5-carboxy-MEPP: Mono(2-ethyl-5-carboxypentyl) phthalate
 *MEHP: Mono(2-ethylhexyl) phthalate

**MnBP: Mono-n-butyl phthalate
 **MiBP: Monoisobutyl phthalate
 **MBzP: Monobenzyl phthalate
 **MEP: Monoethyl phthalate (MEP)
 OH-MiNP: Mono(hydroxy-iso-nonyl)phthalate (metabolite of Di-iso-nonylphthalate) **NEW
 cx-MiNP: Mono(carboxy-iso-octyl)phosphate (metabolite of Di-iso-nonylphthalate) **NEW

***7OH-MINCH: Cyclohexane-1,2-dicarboxylate-mono-(7-hydroxy-4-methyl)octyl ester
 ***7oxo-MINCH: Cyclohexane-1,2-dicarboxylate-mono-(7-oxo-4-methyl)octyl ester
 ***7cx-MINCH: Cyclohexane-1,2-dicarboxylate-mono-(7-carboxylate-4-methyl)heptyl ester

****5OH-MEHP: Mono-(2-ethyl-5-hydroxyhexyl) terephthalat
 ****5cx-MEHP: Mono-(2-ethyl-5-carboxypentyl) terephthalate

Mercapturic acids

(control material **17** A/B, 5 ml)

- 38 Benzene metabolite (S-PMA*)
- 147 Butadiene metabolites (DHBMA**, MHBMA1**!!!, MHBMA2**!!!)
- 149 Acrylamide/Acrylonitrile metabolites (AAMA***, GAMA***, CEMA***)
- 152 other mercapturic acids (HEMA****, 2-HPMA****, 3-HPMA****)
- 155 DMF metabolite (AMCC*****)

*S-PMA: S-Phenylmercapturic acid

**DHBMA: 3,4-Dihydroxybutylmercapturic acid

**MHBMA1: 1-Hydroxymethyl-2-propenyl mercapturic acid !!!

**MHBMA2: 2-Hydroxy-3-butenylmercapturic acid !!!

!!! Please use only isomer-specific reference substances to calibrate these parameters! Our investigations have shown that an equimolar isomer distribution is not guaranteed for mixtures.

***AAMA: 2-Carbonamideethylmercapturic acid

***GAMA: 2-Carbonamide-2-hydroxyethylmercapturic acid

***CEMA: 2-Cyanoethylmercapturic acid

****HEMA: 2-Hydroxyethylmercapturic acid

****2-HPMA: 2-Hydroxypropylmercapturic acid

****3-HPMA: 3-Hydroxypropylmercapturic acid

*****AMCC: Acetyl-S-(N-methylcarbamoyl)cysteine

Tobacco-specific parameters

(control material **18** A/B, 5 mL)

- 172 4-(Methylnitrosamine)-1-(3-pyridyl)-1-butanol (NNAL)
- 93 Nicotine and metabolite (Nicotine, Cotinine)

Aromatic hydrocarbons in urine

(control material **19** A/B)

- 182 Aromatic hydrocarbons (Benzene, Toluene, Xylenes, Ethylbenzene)

For carrying out the determination I require vials with the following volume:

20 ml (Perkin Elmer HS) (2 ml urine)

10 ml (1 ml urine)

Alcohols/ Ether/ Ketones(control material **12** A/B)

- 54 Alcohols and Ethers (Methanol, Methyl-tert-butylether, Tetrahydrofuran, n-Butanol)
- 55 Ketones (Acetone, Methyl-ethylketone (MEK), Methylisobutylketone (MiBK), Methyl-n-butylketone (MtBE))

For carrying out the determination I require vials with the following volume:

20 ml (Perkin Elmer HS) (2 ml urine)

10 ml (1 ml urine)

ANALYTICAL PARAMETERS IN CONTROL SERUM

- **5 mL control serum** (for each concentration level) are available for analysis:

Organohalogen compounds(control material **10** A/B, 5mL)

- 95 DDT parameters (p,p`-DDT\*, p,p`-DDE*)
- 96 Hexachlorobenzene (HCB)
- 97 Hexachlorocyclohexane (α -, β -, γ -HCH)
- 100 Polychlorinated biphenyls (Ballschmitter numbers: 28, 52, 101, 138, 153, 180)
- 106 Pentachlorophenol (PCP)
- 120 Perfluoroalkanoic acids (PFOA**, PFNA**, PFDA**)
- 121 Perfluoroalkyl sulfonic acids (PFOS (n-isomer)***, PFHxS***, PFHpS***, PFBS***)

*p,p`-DDT: p,p`-Dichlorodiphenyltrichloroethane
 *p,p`-DDE: p,p`-Dichlorodiphenyldichloroethane

**PFOA: Perfluorooctanoic acid
 **PFNA: Perfluorononanoic acid
 **PFDA: Perfluorodecanoic acid

***PFOS: Perfluorooctane sulfonic acid
 ***PFHxS: Perfluorohexane sulfonic acid
 ***PFHpS: Perfluoroheptane sulfonic acid
 ***PFBS: Perfluorobutanesulfonic acid

ANALYTICAL PARAMETERS IN CONTROL PLASMA

- **3 ml control plasma** (for each concentration level) are available for analysis:

Metals

(control material **11** A/B, 3 mL)

107 Aluminium (Al)

108 Chromium (Cr)

109 Cobalt (Co)

110 Copper (Cu)

112 Manganese (Mn)

113 Nickel (Ni)

114 Platinum (Pt)

115 Selenium (Se)

116 Zinc (Zn)

157 Molybdenum (Mo)

158 Magnesium (Mg)

199 Lead (Pb)

212 Indium (In)

231 Lithium (Li)

NEW

Analytical Parameters in Globin

N-terminal adducts in hemoglobin:

Control material **13** A/B)

- To analyse N-terminal adducts 300 mg human globin is available for each concentration level
- The analysis of the five substances counts as one parameter

130 Globin adducts:

- Methylvaline (MeV)
- 2-Hydroxyethylvaline (HEV)
- 2-Cyanoethylvaline (CEV)
- 2-Carbamoylvaline (AAV)
- 2-Hydroxypropylvaline (2-HPV)

Order form - additional material

Please note: We are not able to provide more than **2 vials of additional samples** for each control material due to reasons of capacity. We have to charge a fee of 15.00 € for each vial you order.

In order to carry out the analysis we require more sample material.

I/We would like to order the following additional control materials:

Parameters in Blood

Metals - Blood (3 mL):

(control material **1** A/B)

ZA1 A_____ x 15.00 €

ZB1 B_____ x 15.00 €

(control material **7** A/B)

ZA7 A_____ x 15.00 €

ZB7 B_____ x 15.00 €

Aromatic hydrocarbons - Blood

(control material **4** A/B)

vial, 20 mL

ZA41 A_____ x 15.00 €

ZB41 B_____ x 15.00 €

vial, 10 mL

ZA42 A_____ x 15.00 €

ZB42 B_____ x 15.00 €

Chlorinated hydrocarbons - Blood

(control material **5** A/B)

vial, 20 mL

ZA51 A_____ x 15.00 €

ZB51 B_____ x 15.00 €

vial, 10 mL

ZA52 A_____ x 15.00 €

ZB52 B_____ x 15.00 €

Date: _____

Lab-ID (please do always quote!): _____

Signature and stamp: _____

Parameters in Urine**Metals - Urine** (5 mL)(control material **2** A/B)**ZA2** A_____x 15.00 €**ZB2** B_____x 15.00 €(control material **8** A/B)**ZA8** A_____x 15.00 €**ZB8** B_____x 15.00 €**Solvent metabolites - Urine** (5 mL)(control material **3** A/B)**ZA3** A_____x 15.00 €**ZB3** B_____x 15.00 €**Amines and Phenolic Compounds- Urine** (5 mL)**Amines parameters - Urine**(control material **14** A/B)**ZA14** A_____x 15.00 €**ZB14** B_____x 15.00 €**Phenolic parameters -Urine**(control material **15** A/B)**ZA15** A_____x 15.00 €**ZB15** B_____x 15.00 €**Phenol und o-Cresol –Urine** (5mL)(control material **16** A/B)**ZA16** A_____x 15.00 €**ZB16** B_____x 15.00 €**Pesticides – Urine** (5 mL)(control material **9** A/B)**ZA9** A_____x 15.00 €**ZB9** B_____x 15.00 €

Date:_____

Lab-ID (please do always quote!):_____

Signature and stamp:_____

Plastizicers – Urine (5 mL)

(control material **20** A/B)

ZA20 A _____ x 15.00 €

ZB20 B _____ x 15.00 €

Mercapturic acids - Urine (5 mL)

(control material **17** A/B)

ZA17 A _____ x 15.00 €

ZB17 B _____ x 15.00 €

Tobacco-specific parameters – Urine (5mL)

(control material **18** A/B)

ZA18 A _____ x 15.00 €

ZB18 B _____ x 15.00 €

Aromatic hydrocarbons - Urine

(control material **19** A/B)

vial, 20 mL

ZA182 A _____ x 15.00 €

ZB182 B _____ x 15.00 €

vial, 10 mL

ZA282 A _____ x 15.00 €

ZB282 B _____ x 15.00 €

Alcohols/Ketones/Ether - Urine

(control material **12** A/B)

vial, 20 mL

ZA01 A _____ x 15.00 €

ZB01 B _____ x 15.00 €

vial, 10 mL

ZA02 A _____ x 15.00 €

ZB02 B _____ x 15.00 €

Date: _____

Lab-ID (please do always quote!): _____

Signature and stamp: _____

Parameters in Serum

Organohalogen compounds -Serum (5 mL)

(control material **10** A/B)

ZA10 A_____x 15.00 €

ZB10 B_____x 15.00 €

Parameters in Plasma

Metals - Plasma (3 mL):

(control material **11** A/B)

ZA11 A_____x 15.00 €

ZB11 B_____x 15.00 €

*Date:*_____

*Lab-ID (please do always quote!):*_____

*Signature and stamp:*_____