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Candidate laboratories to perform the analysis of biomarkers of exposure in HBM4EU WP9

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Database of candidate laboratories for the
1st prioritisation round of substances

WP 9 - Laboratory analysis and quality assurance

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2 Introduction

The objective of the task 9.2 was to elaborate a list of candidate laboratories for the substances selected in the 1st HBM4EU round of prioritisation for:

- ▶ Performing chemical analysis of biomarkers
- ▶ Developing new analytical methods
- ▶ Supporting Quality Assurance/Quality Control (QA/QC) program in WP9

These candidate laboratories could take part in the activities of HBM4EU after their subsequent successful participation in the Interlaboratory Comparison Investigations (ICIs) and External Quality Assurance Scheme (EQUAS) (biomarker analysis) or after being selected according to the criteria defined by experts (new analytical methods and QA/QC support).

3 Lists of candidate laboratories

Candidate laboratories to perform the analysis of biomarkers of exposure

For the preparation of the list of candidate laboratories for the analysis of the different substances selected in the 1st round of prioritisation, the results of the surveys completed by 83 European laboratories were blindly evaluated by two independent evaluators: the University Institute for Biomedical and Health Research of the University of Las Palmas de Gran Canaria (ULPGC, Spain) and the Biomarkers Unit of the National Centre for Environmental Health of the Institute of Health Carlos III (ISCIII, Spain). The evaluation was performed according to the previously established criteria indicated elsewhere (Deliverable 9.3).

Subsequently, the ULPGC calculated the averages of both independent assessments and calculated the coefficient of variation ((standard deviation / mean) x 100). For those laboratories in which the coefficient of variation was higher than 20%, a reevaluation was made and a joint score between the two evaluators was agreed for those criteria in which there was a discrepancy.

The score distribution of the laboratories evaluated for each chemical group was analysed and the 75th, 50th, 25th and 10th percentiles were calculated. Nevertheless, after suggestions received from the Governing Board on the 4th September 2017, it was decided not to apply any cutoff value and exclude only those laboratories who do not accomplished the direct exclusion criterion (i.e. experience in analysing human samples). The scoring obtained will be used after completion of the QA/QC program in case of there would have been more than one laboratory available for a single task.

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3.1.1 Phthalates

Table 1: List of candidate laboratories for the analysis of phthalates

Laboratory/Group	Centre	Country
Testing Laboratory for environmental analysis, GMO and fuel analysis	Umweltbundesamt GmbH	Austria
Department of Pharmaceutical Sciences	University of Antwerpen	Belgium
VITO - goal	VITO	Belgium
Toxicology Lab	CHU-ULg	Belgium
Unit for Chemical Safety of Products	National Institute of Public Health	Czech Republic
Trace Analytical Laboratory	Research Centre for Toxic Compounds in the Environment (RECETOX)	Czech Republic
Chemical Laboratory at Dep. of Growth and Reproduction	Rigshospitalet, Region Hovedstaden (RegionH)	Denmark
Environmental health / Chemical risk team	National institute for health and welfare (THL) / Department of Health Security	Finland
Work Environment Laboratories	Finnish Institute of Occupational Health	Finland
Department Toxicology and Biomonitoring	INRS	France
Institute for Prevention and Occupational Medicine of the German Social Accident Insurance (IPA)	Ruhr-Universität Bochum	Germany
Institute of Biomonitoring	Currenta GmbH&Co.OHG, SEL-SER-GS	Germany
Medizinisches Labor Bremen	Medizinisches Labor Bremen	Germany
Cardiometabolic Risk Unit	Institute of Clinical Physiology CNR	Italy
Biological Monitoring team	Health & Safety Laboratory	KU
Environmental Exposure and Epidemiology	Norwegian Institute of Public Health	Norway
Physiological Analytical Laboratory	Constantine the Philosopher University in Nitra	Slovakia
Laboratory of Separation Methods	Institute of Chemistry, Faculty of Natural Sciences	Slovakia
Public Health Laboratory of Valencia	Public Health Department	Spain
Occupational and environmental medicine	Laboratory medicine	Sweden
Vrije Universiteit Amsterdam	Department Environment & Health	The Netherlands
Environmental Monitoring Sensing and Analyses (EMSA)	the Netherlands Organization for Applied Scientific Research (TNO)	The Netherlands

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3.1.2 DINCH

Table 2: List of candidate laboratories for the analysis of DINCH

Laboratory/Group	Centre	Country
Institute for Prevention and Occupational Medicine of the German Social Accident Insurance (IPA)	Ruhr-Universität Bochum	Germany
Department of Pharmaceutical Sciences	University of Antwerpen	Belgium
VITO - goal	VITO	Belgium
Environmental Exposure and Epidemiology	Norwegian Institute of Public Health	Norway
Laboratory of Separation Methods	Institute of Chemistry, Faculty of Natural Sciences	Slovakia
Occupational and environmental medicine	Laboratory medicine	Sweden
IVL Swedish Environmental Research Institute	IVL Swedish Environmental Research Institute	Sweden

3.1.3 Bisphenols

Table 3: List of candidate laboratories for the analysis of bisphenols

Laboratory/Group	Centre	Country
Institute for Prevention and Occupational Medicine of the German Social Accident Insurance (IPA)	Ruhr-Universität Bochum	Germany
Testing Laboratory for environmental analysis, GMO and fuel analysis	Umweltbundesamt GmbH	Austria
Department of Pharmaceutical Sciences	University of Antwerpen	Belgium
Toxicology Lab	CHU-ULg	Belgium
Laboratory for Occupational and Environmental Hygiene	KU Leuven	Belgium
Water and Health Laboratory	Cyprus International Institute for Environmental and Public Health, Cyprus University of Technology	Cyprus
Unit for Chemical Safety of Products	National Institute of Public Health	Czech Republic
Trace Analytical Laboratory	Research Centre for Toxic Compounds in the Environment (RECETOX)	Czech Republic
Chemical Laboratory at Dep. of Growth and Reproduction	Rigshospitalet, Region Hovedstaden (RegionH)	Denmark
Research Center for Advanced Analytical Chemistry	University of Copenhagen, Faculty of Science, Department of Plant and Environmental Sciences	Denmark
Environmental health / Chemical risk team	National institute for health and welfare (THL) / Department of Health Security	Finland
Work Environment Laboratories	Finnish Institute of Occupational Health	Finland
LABERCA	INRA, Oniris	France
INRA Toxalim	INRA	France

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Laboratory/Group	Centre	Country
Department Toxicology and Biomonitoring	INRS	France
HBM Laboratory	BASF SE - Corporate Health Management	Germany
Medizinisches Labor Bremen	Medizinisches Labor Bremen	Germany
Institute of Biomonitoring	Currenta GmbH&Co.OHG, SEL-SER-GS	Germany
Analytical-toxicological laboratory	Institute for Occupational and Social Medicine	Germany
Cardiometabolic Risk Unit	Institute of Clinical Physiology CNR	Italy
Biological Monitoring team	Health & Safety Laboratory	KU
Environmental Exposure and Epidemiology	Norwegian Institute of Public Health	Norway
Laboratory of the Department of Toxicology	Medical University of Gdańsk, Faculty of Pharmacy	Poland
Laboratory of Separation Methods	Institute of Chemistry, Faculty of Natural Sciences	Slovakia
Department of Environmental Sciences	Jozef Stefan Institute	Slovenia
Public Health Laboratory of Valencia	Public Health Department	Spain
Occupational and environmental medicine	Laboratory medicine	Sweden
IST Laboratory	Work and health Institute	Switzerland
Vrije Universiteit Amsterdam	Department Environment & Health	The Netherlands
Environmental Monitoring Sensing and Analyses (EMSA)	the Netherlands Organization for Applied Scientific Research (TNO)	The Netherlands

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3.1.4 Per and polyfluorinated alkylated substances

Table 4: List of candidate laboratories for the analysis of per and polyfluorinated alkylated substances

Laboratory/Group	Centre	Country
Testing Laboratory for environmental analysis, GMO and fuel analysis	Umweltbundesamt GmbH	Austria
Toxicology Lab	CHU-ULg	Belgium
VITO - goal	VITO	Belgium
Trace Analytical Laboratory	Research Centre for Toxic Compounds in the Environment (RECETOX)	Czech Republic
Environmental Medicine Laboratory, Department of Public Health	University of Southern Denmark	Denmark
Aarhus University	Aarhus University	Denmark
Environmental health / Chemical risk team	National institute for health and welfare (THL) / Department of Health Security	Finland
LABERCA	INRA, Oniris	France
Analytical-toxicological laboratory	Institute for Occupational and Social Medicine	Germany
Laboratory for Water Analysis	Umweltbundesamt (Federal Environment Agency)	Germany
Department of Environment and Health, PAHs and PFAS	Istituto Superiore di Sanità	Italy
Environmental Exposure and Epidemiology	Norwegian Institute of Public Health	Norway
Chromatography laboratory - Biomarkers laboratory	National Center for Environmental Health Institute of Health Carlos III	Spain
Public Health Laboratory of Valencia	Public Health Department	Spain
Occupational and environmental medicine	Laboratory medicine	Sweden
Vrije Universiteit Amsterdam	Department Environment & Health	The Netherlands
Environmental Monitoring Sensing and Analyses (EMSA)	the Netherlands Organization for Applied Scientific Research (TNO)	The Netherlands

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3.1.5 Brominated flame retardants

Table 5: List of candidate laboratories for the analysis of brominated flame retardants

Laboratory/Group	Centre	Country
Testing Laboratory for environmental analysis, GMO and fuel analysis	Umweltbundesamt GmbH	Austria
Department of Pharmaceutical Sciences	University of Antwerpen	Belgium
Organic and Biological Analytical Chemistry (CART)	University of Liege	Belgium
Toxicology Lab	CHU-ULg	Belgium
VITO - goal	VITO	Belgium
Trace Analytical Laboratory	Research Centre for Toxic Compounds in the Environment (RECETOX)	Czech Republic
Aarhus University	Aarhus University	Denmark
Environmental health / Chemical risk team	National institute for health and welfare (THL) / Department of Health Security	Finland
LABERCA	INRA, Oniris	France
Institute of Biomonitoring	Currenta GmbH&Co.OHG, SEL-SER-GS	Germany
Laboratory of Hygiene and Occupational Diseases	RSU Institute of Occupational and Environmental Health	Latvia
Environmental Exposure and Epidemiology	Norwegian Institute of Public Health	Norway
Department of Toxic Organic Pollutants	Slovenská Zdravotnícka Univerzita v Bratislave	Slovakia
Department of Environmental Sciences	Jozef Stefan Institute	Slovenia
Laboratory of Toxicology	University of Las Palmas de Gran Canaria	Spain
Chromatography laboratory - Biomarkers Unit	National Center for Environmental Health Institute of Health Carlos III	Spain
Public Health Laboratory of Valencia	Public Health Department	Spain
Chemistry Division	National Food Agency	Sweden
Vrije Universiteit Amsterdam	Department Environment & Health	The Netherlands
Environmental Monitoring Sensing and Analyses (EMSA)	the Netherlands Organization for Applied Scientific Research (TNO)	The Netherlands

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3.1.6 Chlorinated flame retardants

Table 6. List of candidate laboratories for the analysis of chlorinated flame retardants

Laboratory/Group	Centre	Country
Department of Pharmaceutical Sciences	University of Antwerpen	Belgium
Organic and Biological Analytical Chemistry (CART)	University of Liege	Belgium
Trace Analytical Laboratory	Research Centre for Toxic Compounds in the Environment (RECETOX)	Czech Republic
Aarhus University	Aarhus University	Denmark
Environmental Exposure and Epidemiology	Norwegian Institute of Public Health	Norway
Laboratory of Toxicology	University of Las Palmas de Gran Canaria	Spain
Vrije Universiteit Amsterdam	Department Environment & Health	The Netherlands

3.1.7 Phosphorus flame retardants

Table 7: List of candidate laboratories for the analysis of phosphorus flame retardants

Laboratory/Group	Centre	Country
Department of Pharmaceutical Sciences	University of Antwerpen	Belgium
VITO - goal	VITO	Belgium
Trace Analytical Laboratory	Research Centre for Toxic Compounds in the Environment (RECETOX)	Czech Republic
Department Toxicology and Biomonitoring	INRS	France
Institute for Prevention and Occupational Medicine of the German Social Accident Insurance (IPA)	Ruhr-Universität Bochum	Germany
Environmental Exposure and Epidemiology	Norwegian Institute of Public Health	Norway
Laboratory of Toxicology	University of Las Palmas de Gran Canaria	Spain
Public Health Laboratory of Valencia	Public Health Department	Spain
Occupational and environmental medicine	Laboratory medicine	Sweden
Vrije Universiteit Amsterdam	Department Environment & Health	The Netherlands

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3.1.8 Polycyclic aromatic hydrocarbons

Table 8. List of candidate laboratories for the analysis of polycyclic aromatic hydrocarbons

Laboratory/Group	Centre	Country
VITO - goal	VITO	Belgium
Laboratory for Occupational and Environmental Hygiene	KU Leuven	Belgium
Laboratory for Food, Medicines and Consumer Safety	Institute for Public Health (WIV-ISP)	Belgium
Trace Analytical Laboratory	Research Centre for Toxic Compounds in the Environment (RECETOX)	Czech Republic
Research Center for Advanced Analytical Chemistry	University of Copenhagen, Faculty of Science, Department of Plant and Environmental Sciences	Denmark
Work Environment Laboratories	Finnish Institute of Occupational Health	Finland
LABERCA	INRA, Oniris	France
Department Toxicology and Biomonitoring	INRS	France
Institute for Prevention and Occupational Medicine of the German Social Accident Insurance (IPA)	Ruhr-Universität Bochum	Germany
ABF Analytisch-Biolotisches Labor	ABF GmbH	Germany
Analytical-toxicological laboratory	Institute for Occupational and Social Medicine	Germany
HBM Laboratory	BASF SE - Corporate Health Management	Germany
Medizinisches Labor Bremen	Medizinisches Labor Bremen	Germany
Department of Environment and Health, PAHs and PFAS	Istituto Superiore di Sanità	Italy
Biological Monitoring team	Health & Safety Laboratory	KU
Laboratory of Hygiene an Occupational Diseases	RSU Institute of Occupational and Environmental Health	Latvia
Laboratory of the Department of Toxicology	Medical University of Gdańsk, Faculty of Pharmacy	Poland
Laboratory of Bromatology and Farmacognosy	Faculty of Pharmacy University of Coimbra	Portugal
Food and Nutrition Department	Instituto Nacional de Saúde Dr. Ricardo Jorge, INSA. National Institute of Health	Portugal
Department of chemical analysis	Regional Authority of Public Health	Slovakia
Laboratory of Separation Methods	Institute of Chemistry, Faculty of Natural Sciences	Slovakia
Laboratory of Toxicology	University of Las Palmas de Gran Canaria	Spain
Chromatography laboratory - Biomarkers Unit	National Center for Environmental Health, Institute of Health Carlos III	Spain
Instituto de Toxicología de la Defensa	Defense Ministry	Spain

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Laboratory/Group	Centre	Country
Public Health Laboratory of Valencia	Public Health Department	Spain
Occupational and environmental medicine	Laboratory medicine	Sweden
IST Laboratory	Work and health Institute	Switzerland

3.1.9 Anilines

Table 9: List of candidate laboratories for the analysis of anilines

Laboratory/Group	Centre	Country
Laboratory for Occupational and Environmental Hygiene	KU Leuven	Belgium
Chemical Laboratory at Dep. of Growth and Reproduction	Rigshospitalet, Region Hovedstaden (RegionH)	Denmark
Department Toxicology and Biomonitoring	INRS	France
Institute for Prevention and Occupational Medicine of the German Social Accident Insurance (IPA)	Ruhr-Universität Bochum	Germany
HBM Laboratory	BASF SE - Corporate Health Management	Germany
Institute of Biomonitoring	Currenta GmbH&Co.OHG, SEL-SER-GS	Germany
Analytical-toxicological laboratory	Institute for Occupational and Social Medicine	Germany
ABF Analytisch-Biologisches Labor	ABF GmbH	Germany
Medizinisches Labor Bremen	Medizinisches Labor Bremen	Germany
Biological Monitoring team	Health & Safety Laboratory	KU
Occupational and environmental medicine	Laboratory medicine	Sweden
Alpine Institute of Chemistry and Toxicology	AICT	Switzerland

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3.1.10 Cadmium

Table 10: List of candidate laboratories for the analysis of cadmium

Laboratory/Group	Centre	Country
Testing Laboratory for environmental analysis, GMO and fuel analysis	Umweltbundesamt GmbH	Austria
Toxicology Lab	CHU-ULg	Belgium
AMGC	Vrije Universiteit Brussel	Belgium
Laboratory for Food, Medicines and Consumer Safety	Institute for Public Health (WIV-ISP)	Belgium
Trace elements and nanomaterials	CODA-CERVA	Belgium
Human Biomonitoring and Control of Industrial Products Laboratory	State General Laboratory, Ministry of Health, Republic of Cyprus	Cyprus
Trace Analytical Laboratory	Research Centre for Toxic Compounds in the Environment (RECETOX)	Czech Republic
Aarhus University	Aarhus University	Denmark
Work Environment Laboratories	Finnish Institute of Occupational Health	Finland
Department Toxicology and Biomonitoring	INRS	France
LERES	French School of Public Health - EHESP	France
Institute for Prevention and Occupational Medicine of the German Social Accident Insurance (IPA)	Ruhr-Universität Bochum	Germany
Analytical-toxicological laboratory	Institute for Occupational and Social Medicine	Germany
Dept Environment and Health	Istituto Superiore di Sanità	Italy
Biological Monitoring team	Health & Safety Laboratory	KU
Laboratory of Hygiene and Occupational Diseases	RSU Institute of Occupational and Environmental Health	Latvia
Laboratory of Neurotoxicology, Neuroscience Institute of Lithuanian University of Health Sciences	LSMU Lietuvos sveikatos mokslų universitetas	Lithuania
Metal Analysis Laboratory	Nofer Institute of Occupational Medicine	Poland
Institute for Bioengineering and Biosciences	Instituto Superior Técnico, Universidade de Lisboa	Portugal
Food and Nutrition Department	Instituto Nacional de Saúde Dr. Ricardo Jorge, INSA. National Institute of Health	Portugal
Department of metallomics	Slovak Medical University	Slovak Republic
Department of Environmental Sciences	Jozef Stefan Institute	Slovenia
Metals laboratory - Biomarkers Unit	National Center for Environmental Health, Institute of Health Carlos III	Spain
Laboratory of Toxicology	University of Las Palmas de Gran Canaria	Spain

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Laboratory/Group	Centre	Country
Instituto de Toxicología del a Defensa	Defense Ministry	Spain
Department of Legal Medicine and Toxicology Service	School of Medicine	Spain
Public Health Laboratory of Valencia	Public Health Department	Spain
Redox Biology and Metabolism	Instituto de Investigación Sanitaria del Principado de Asturias (IISPA) - University of Oviedo	Spain
Occupational and enviromental medicine	Laboratory medicine	Sweden
Metals and Health, Institute of Environmental Medicine	Karolinska Institutet	Sweden
IST Laboratory	Work and health Insitute	Switzerland
Environmental Monitoring Sensing and Analyses (EMSA)	the Netherlands Organization for Applied Scienctific Research (TNO)	The Netherlands
Inorganic Geochemistry	British Geological Survey	UK

3.1.11 Chromium VI

Table 11: List of candidate laboratories for the analysis of chromium VI

Laboratory/Group	Centre	Country
Laboratory for Occupational and Environmental Hygiene	KU Leuven	Belgium
Work Environment Laboratories	Finnish Institute of Occupational Health	Finland
Department Toxicology and Biomonitoring	INRS	France
Institute for Prevention and Occupational Medicine of the German Social Accident Insurance (IPA)	Ruhr-Universität Bochum	Germany
Dept Environment and Health	Istituto Superiore di Sanità	Italy
Metal Analysis Laboratory	Nofer Institute of Occupational Medicine	Poland
Department of Environmental Sciences	Jozef Stefan Institute	Slovenia
Redox Biology and Metabolism	Instituto de Investigación Sanitaria del Principado de Asturias (IISPA) - University of Oviedo	Spain
Environmental Monitoring Sensing and Analyses (EMSA)	the Netherlands Organization for Applied Scientific Research (TNO)	The Netherlands
Biological Monitoring team	Health & Safety Laboratory	UK
Inorganic Geochemistry	British Geological Survey	UK