禁止化学武器组织 技术秘书处

Office of the Deputy Director-General
S/545/2006
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CHINESE
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技术秘书处的说明

关于成员国分析生物医学样品能力的问卷

1. 《化学武器公约》《核查附件》第十一部分第 16 和第 17 款规定，禁化武组织在开展指称使用化学武器调查期间可收集生物医学样品。对这些样品进行分析可帮助视察组就此种指称的使用作出结论。

2. 总干事根据科学咨询委员会（科咨委）在其第六届会议的报告（SAB-6/1, 2004 年 2 月 18 日）中所提的建议，组建了生物医学样品临时工作组。该临时工作组于 2004 年 11 月 17 日至 19 日召开会议，建议禁化武组织“建立和维护一个活跃在生物医学分析领域的成员国实验室名单，载明其能力”。科咨委在其第七届会议的报告中核可了此项建议（SAB-7/1, 2005 年 3 月 11 日）。

3. 技术秘书处（以下称“秘书处”）预期该临时工作组将在这一领域开展更多工作，因此，拟定了一份关于各成员国分析生物医学样品能力的问卷，附在本文后面。

4. 请各国家主管部门将这份问卷的复制件转给它们认为也许具备此种能力的实验室。

5. 请有关实验室填写这份问卷并至迟于 2006 年 3 月 31 日将问卷交给禁化武组织实验室。问卷应交给：

Mr Mieczyslaw Sokolowski
Acting Head
OPCW Laboratory
Heulweg 28-30
2288 GN Rijswijk
The Netherlands

附件（只有英文）：

Questionnaire on the Capabilities of Member States regarding the Analysis of Biomedical Samples（关于成员国分析生物医学样品能力的问卷）

Appendix 1: Sampling and Analysis of Biomedical Samples for the Presence of Chemical Agents: Key Methods
（附录 1： 用以检测化学毒剂的生物医学样品取样和分析：关键方法 ）

Appendix 2: Analytical Methods in Use in Your Laboratory
（附录 2： 贵实验室使用的分析方法 ）

Annex

QUESTIONNAIRE ON THE CAPABILITIES OF MEMBER STATES REGARDING THE ANALYSIS OF BIOMEDICAL SAMPLES

1.	State Party		
2.	Laboratory name		
3.	Contact person	Family name:	First name:
4.	Contact address (Please do not give a post-office box number)	Street	
		Number Post code	
		City	
		Country	
5.	E-mail address		
6.	Telephone numbers, including country and city codes	Work	
		Mobile	
7.	Fax numbers, including country and city codes	Home	
		Work	
8.	Is your laboratory currently conducting research into techniques for analysing biomedical samples for the presence of scheduled chemicals, their free metabolites, or other conjugated biomarkers of exposure, such as DNA or protein adducts?	Yes ☐	No ☐
		If so, please provide a separate list of references to any publications by your laboratory in this area and, if possible, copies of any of these publications that have appeared within the last five years.	
9.	If your laboratory is active in biomedical sampling and analysis, please describe the quality-control systems it has in place, such as external accreditation, and recognition for Good Laboratory Practice.		
10.	Is your laboratory interested in participating in an effort to establish an OPCW capability to analyse biomedical samples?	Yes ☐	No ☐
		Please provide any comments in the space below.	

11.	Is your laboratory willing to be designated by the Director-General of the Secretariat to analyse biomedical samples in the context of OPCW activities and proficiency testing?	Yes ☐	No ☐
		Please provide any comments in the space below.	
12.	Is your laboratory willing to participate in inter-laboratory confidence-building exercises?	Yes ☐	No ☐
		Please provide any comments in the space below.	
13.	Is your laboratory willing to participate in proficiency testing with a view to being selected as an OPCW Designated Laboratory?	Yes ☐	No ☐
		Please provide any comments in the space below.	
14.	Is your laboratory willing to share its knowledge and skills regarding the analysis of biomedical samples—for example, by providing training to technicians from other Member States?	Yes ☐	No ☐
		Please provide any comments in the space below.	
15.	Would your laboratory be willing to analyse samples obtained by the OPCW in connection with an investigation into the alleged use of chemical weapons?	Yes ☐	No ☐
		Please provide any comments in the space below.	

Appendix 1

SAMPLING AND ANALYSIS OF BIOMEDICAL SAMPLES FOR THE PRESENCE OF CHEMICAL AGENTS: KEY METHODS[1]

The following tables list analytical methods that the temporary working group on biomedical samples considers to be particularly useful. Please indicate, in the fourth column, what capability, if any, your laboratory has for each method listed. Please make any additional comments in the last column.

TABLE 1: ANALYTICAL METHODS TO CHECK FOR THE PRESENCE OF SULFUR MUSTARD

Sample Type	Key Biomarkers	Analytical Methods Currently Available	Is the Method Available in Your Laboratory?		Comments
			Yes	No	
Urine	Thiodiglycol (TDG)	GC-MS-MS	☐	☐	
	TDGO β-lyase metabolites	LC-MS-MS	☐	☐	
Blood	Protein adducts: N-terminal valine on Hb	Chemical or enzymatic digestion, followed by: GC-MS or GC-MS-MS	☐	☐	

[1] Adapted from Appendix 6 to the report of the Seventh Session of the SAB (SAB-7/1).
Legend for abbreviations used in this Annex:
BA: Benzilic acid
BuChE: Butyryl-cholinesterase
BZ: 3-quinuclidinyl benzilate
CVAA: 2-chlorovinyl-arsenous acid
DNA: Deoxyribose nucleic acid
EI: Electron impact
ELISA: Enzyme-linked immunosorbent assay
GC-MS-MS: gas chromatography–mass spectrometry–mass spectrometry
Hb: Haemoglobin
HETE: Hydroxyethylthioethyl
HR: High resolution
LC-MS-MS: Liquid chromatography-mass spectrometry-mass spectrometry
Q: 3-quinuclidinol
TDGO: Thiodiglycol sulfoxide

Sample Type	Key Biomarkers	Analytical Methods Currently Available	Is the Method Available in Your Laboratory?		Comments
			Yes	No	
Blood, continued	Protein adducts:	Chemical or enzymatic digestion, followed by:			
	Histidine residues on Hb	LC-tandem MS	☐	☐	
	Cysteine residue on albumin	LC-tandem MS	☐	☐	
	Aspartic acid/glutamic acid residues on blood proteins and keratin	GC-MS	☐	☐	
Urine	DNA adducts: Alkylation of deoxyguanosine (N7)	LC-MS-MS for N7-HETE-guanine	☐	☐	
Blood	Alkylation of deoxyguanosine (N7)	ELISA for N7-HETE-guanosine-5'-phosphate	☐	☐	
	Other biomarkers		☐	☐	

TABLE 2: ANALYTICAL METHODS TO CHECK FOR THE PRESENCE OF NERVE AGENTS

Sample Type	Key Biomarkers	Analytical Methods Recommended	Is the Method Available in Your Laboratory?		Comments
			Yes	No	
Blood	Cholinesterase activity		☐	☐	
Blood	Fluoride reactivation method: Phosphylated BuChE (and other proteins)	GC-MS GC-HR-MS with large-volume injection	☐ ☐	☐ ☐	
Blood	Analysis of phosphylated peptides: Phosphylated BuChE	LC-MS-MS (after enzymatic digestion of modified cholinesterase)	☐	☐	
Urine/serum	Hydrolysis products: Alkyl methyl-phosphonic acids (does not include tabun)	GC-MS-MS LC-MS-MS	☐ ☐	☐ ☐	

Sample Type	Key Biomarkers	Analytical Methods Recommended	Is the Method Available in Your Laboratory?		Comments
			Yes	No	
	Other biomarkers		☐	☐	

TABLE 3: ANALYTICAL METHODS TO CHECK FOR THE PRESENCE OF LEWISITE

Sample Type	Key Biomarkers	Analytical Methods Recommended	Is the Method Available in Your Laboratory?		Comments
			Yes	No	
Urine	CVAA	Solid-phase micro-extraction headspace sampling, followed by GC-MS with EI ionisation	☐	☐	
Blood	CVAA (globin bound and free)	GC-MS	☐	☐	
	Other biomarkers		☐	☐	

TABLE 4: ANALYTICAL METHODS TO CHECK FOR THE PRESENCE OF PHOSGENE

Sample Type	Key Biomarkers	Analytical Methods Recommended	Is the Method Available in Your Laboratory?		Comments
			Yes	No	
Blood	Protein adduct: Albumin peptide	LC-MS-MS	☐	☐	
	Other biomarkers		☐	☐	

TABLE 5: ANALYTICAL METHODS TO CHECK FOR THE PRESENCE OF CYANIDE

Sample Type	Key Biomarkers	Analytical Methods Recommended	Is the Method Available in Your Laboratory?		Comments
			Yes	No	
Blood	Cyanide itself	GC	☐	☐	
Urine	Cystine adduct	HPLC	☐	☐	
	SCN	GC–LC	☐	☐	
	2-amino-thiazoline, 4-carboxylic acid	GC–LC	☐	☐	
	Other biomarkers		☐	☐	

TABLE 6: ANALYTICAL METHODS TO CHECK FOR THE PRESENCE OF BZ

Sample Type	Key Biomarkers	Analytical Methods Recommended	Is the Method Available in Your Laboratory?		Comments
			Yes	No	
Urine	BZ, BA Q	LC-MS-MS	☐	☐	
	Other biomarkers		☐	☐	

Appendix 2

ANALYTICAL METHODS IN USE IN YOUR LABORATORY[2]

Sample Type[3]	Biomarker[4]	Analytical Technique and Instrumentation[5]	Comments[6]

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2 Please include additional copies of this page if necessary.
3 Blood, urine, and so on
4 Phosphylated BuChE, CVAA, and so on
5 GC-MS, LC-MS-MS, and so on
6 Please mention any relevant quality-control procedures, any accreditation the laboratory has earned in respect of this method, and so on.