



**OIAC**

**Secrétariat technique**

Cabinet du Directeur général adjoint

S/545/2006

6 février 2006

FRANÇAIS

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## **NOTE DU SECRÉTARIAT TECHNIQUE**

### **QUESTIONNAIRE SUR LES CAPACITÉS DES ÉTATS MEMBRES EN MATIÈRE D'ANALYSE D'ÉCHANTILLONS BIOMÉDICAUX**

1. La collecte d'échantillons biomédicaux pendant les enquêtes de l'OIAC sur une allégation d'emploi d'armes chimiques est prévue aux paragraphes 16 et 17 de la onzième partie de l'Annexe sur la vérification de la Convention sur l'interdiction des armes chimiques. L'analyse de ces échantillons peut aider les équipes d'inspection à tirer des conclusions au sujet d'une allégation d'emploi de ce genre.
2. En se fondant sur les recommandations du Conseil scientifique consultatif ("le Conseil scientifique") contenues dans le rapport de sa sixième session (SAB-6/1 du 18 février 2004), le Directeur général a créé un groupe de travail temporaire sur les échantillons biomédicaux. Lors d'une réunion qu'il a tenue du 17 au 19 novembre 2004, le groupe de travail temporaire a recommandé que l'OIAC "établisser et actualise un inventaire des laboratoires des États membres qui sont actifs dans le domaine de l'analyse biomédicale, ainsi qu'un inventaire de leurs moyens". Dans le rapport de sa septième session, le Conseil scientifique a entériné cette recommandation (SAB-7/1 du 11 mars 2005).
3. En anticipation des travaux complémentaires du groupe de travail temporaire dans ce domaine, le Secrétariat technique ("le Secrétariat") a préparé un questionnaire, ci-annexé, sur les capacités des États membres en matière d'analyse d'échantillons biomédicaux.
4. Les autorités nationales sont invitées à transmettre ce questionnaire aux laboratoires qu'elles pensent dotés des capacités requises.
5. Les laboratoires sont invités à remplir le questionnaire et à le renvoyer au laboratoire de l'OIAC avant le 31 mars 2006. Les questionnaires sont à envoyer à :

M. Mieczyslaw Sokolowski  
Chef par intérim  
Laboratoire de l'OIAC  
Heulweg 28-30  
2288 GN Rijswijk (Pays-Bas)



Annexe (en anglais seulement) :

Questionnaire on the Capabilities of Member States regarding the Analysis of Biomedical Samples (Questionnaire sur les capacités des États membres en matière d'analyse d'échantillons biomédicaux)

Appendice 1 : Sampling and Analysis of Biomedical Samples for the Presence of Chemical Agents: Key Methods (Prélèvement et analyse d'échantillons biomédicaux pour déterminer la présence d'agents chimiques : principales méthodes)

Appendice 2 : Analytical Methods in Use in Your Laboratory (Méthodes analytiques utilisées dans votre laboratoire)

## 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 <input type="checkbox"/>	No <input type="checkbox"/>
		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.	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	
10.	Is your laboratory interested in participating in an effort to establish an OPCW capability to analyse biomedical samples?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
		Please provide any comments in the space below.	
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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 <input type="checkbox"/>	No <input type="checkbox"/>
		Please provide any comments in the space below.	
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12.	Is your laboratory willing to participate in inter-laboratory confidence-building exercises?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
		Please provide any comments in the space below.	
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13.	Is your laboratory willing to participate in proficiency testing with a view to being selected as an OPCW Designated Laboratory?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
		Please provide any comments in the space below.	
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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 <input type="checkbox"/>	No <input type="checkbox"/>
		Please provide any comments in the space below.	
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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 <input type="checkbox"/>	No <input type="checkbox"/>
		Please provide any comments in the space below.	
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## Appendix 1

### SAMPLING AND ANALYSIS OF BIOMEDICAL SAMPLES FOR THE PRESENCE OF CHEMICAL AGENTS: KEY METHODS<sup>1</sup>

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) TDGO β-lyase metabolites	GC-MS-MS	<input type="checkbox"/>	<input type="checkbox"/>	-----
		LC-MS-MS	<input type="checkbox"/>	<input type="checkbox"/>	-----
Blood	Protein adducts:  N-terminal valine on Hb	Chemical or enzymatic digestion, followed by: GC-MS or GC-MS-MS	<input type="checkbox"/>	<input type="checkbox"/>	-----
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<sup>1</sup> 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:** Benzoic 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: Histidine residues on Hb	Chemical or enzymatic digestion, followed by: LC-tandem MS	<input type="checkbox"/>	<input type="checkbox"/>	
	Cysteine residue on albumin	LC-tandem MS	<input type="checkbox"/>	<input type="checkbox"/>	
	Aspartic acid/glutamic acid residues on blood proteins and keratin	GC-MS	<input type="checkbox"/>	<input type="checkbox"/>	
Urine	DNA adducts: Alkylation of deoxyguanosine (N7)	LC-MS-MS for N7-HETE-guanine	<input type="checkbox"/>	<input type="checkbox"/>	
Blood	Alkylation of deoxyguanosine (N7)	ELISA for N7-HETE-guanosine-5'-phosphate	<input type="checkbox"/>	<input type="checkbox"/>	
	Other biomarkers		<input type="checkbox"/>	<input type="checkbox"/>	

**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		<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----
Blood	Fluoride reactivation method:  Phosphylated BuChE (and other proteins)	GC-MS	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----
		GC-HR-MS with large-volume injection	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----
Blood	Analysis of phosphylated peptides:  Phosphylated BuChE	LC-MS-MS (after enzymatic digestion of modified cholinesterase)	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- ----- ----- -----
Urine/serum	Hydrolysis products:  Alkyl methyl-phosphonic acids (does not include tabun)	GC-MS-MS	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----
		LC-MS-MS	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----

Sample Type	Key Biomarkers	Analytical Methods Recommended	Is the Method Available in Your Laboratory?		Comments
			Yes	No	
	Other biomarkers		<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----

**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	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----
Blood	CVAA (globin bound and free)	GC-MS	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----
	Other biomarkers		<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----



**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	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----
	Other biomarkers		<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----

**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	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----
Urine	Cystine adduct SCN 2-amino-thiazoline, 4-carboxylic acid	HPLC GC-LC GC-LC	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	----- ----- ----- -----
	Other biomarkers		<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----

**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	LC-MS-MS	<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----
	Q				
	Other biomarkers		<input type="checkbox"/>	<input type="checkbox"/>	----- ----- -----

## Appendix 2

### ANALYTICAL METHODS IN USE IN YOUR LABORATORY<sup>2</sup>

Sample Type <sup>3</sup>	Biomarker <sup>4</sup>	Analytical Technique and Instrumentation <sup>5</sup>	Comments <sup>6</sup>

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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.