

28th Session of the OPCW Scientific Advisory Board Briefing to States Parties

Friday 14 June 2019

Jeper Room 13:30 - 15:00

Light lunch served at 13:00





OPCW

Organisation for the Prohibition of Chemical Weapons

OPCW Scientific Advisory Board Briefing to States Parties

Cheng Tang SAB Chair

Christopher Curty SAB Vice-Chair

14 June 2019

Outline

- **Overview of the SAB**
- **Updates on activities since the SAB 27**
- **Brief summary of the SAB 28**
- **SAB's road map to the 5th Review Conference**





Valentin Rubaylo
1946 – 2019

A dear colleague, a committed member of the SAB, a good friend



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Organisation for the Prohibition of Chemical Weapons



Scientific Advisory Board 2019



SAB reports to the DG, who then submits its reports, alongside his response, to the EC.

Meet once or twice per year

Chair and Vice-Chair elected by the members

Maximum of two consecutive three-year terms of office

25 independent experts

“To enable the Director-General, in the performance of his functions, to render specialized advice in areas of science and technology relevant to this Convention, to the Conference, the Executive Council or States Parties.”

- CWC Article VIII, Paragraph 21(h)

Scientific Advisory Board 2019

Turnover of the SAB



Mr Wilford Z. Jwalshik
Nigeria

Dr Andrea Leisewitz
Chile

Professor Mostafa Ghanei
Iran

Mr. Günter Povoden
Austria

Scientific Advisory Board 2019

Periodic Table of the OPCW Scientific Advisory Board and its Temporary Working Groups from 1998 to 2019

In Honour of the International Year of the Periodic Table of Chemical Elements 2019

1 SE Swedenium 17/06/1993		2 NO Norwagium 07/04/1994	
3 AU Australium 06/05/1994		4 ES Españium 03/08/1994	
11 HR Hrvatium 23/05/1995		12 MC Monacoium 01/06/1995	
19 NA Nambium 28/11/1995		20 IT Italium 08/12/1995	
37 ML Malium 28/04/1997		38 MT Maltavium 28/04/1997	
55 SV El Salvadorium 30/10/1995		56 GE Georgium 27/11/1995	
87 SR Surinamium 28/04/1997		88 CU Cubatum 29/04/1997	
119 PA Panamanium 07/10/1998		120 UA Ukrainium 14/10/1998	
151 AD Andorium 27/02/2003		152 TL Timor Lastium 07/05/2003	
183 CG Congovium 04/12/2007		184 GW Gambasiatum 20/05/2008	
185 LB Lebanonium 20/11/2008			
<p>Order of Entry Into Force</p> <p>Country Element</p> <p>Country Symbol</p> <p>Hydrogen</p> <p>1</p> <p>1 H</p> <p>Country Symbol</p> <p>Hydrogen</p> <p>dd/mm/yyyy</p> <p>Date of Deposit</p> <p>LEGEND</p> <ul style="list-style-type: none"> Western Europe and Other States (WEOG) Eastern Europe Africa Latin America and the Caribbean (GRULAC) Asia 			
22 MA Morocovium 28/12/1995	23 BR Brazilium 13/03/1996	24 GB Britanium 13/05/1996	25 MD Moldovium 08/07/1996
40 MU Mauritium 09/02/1993	41 AL Albanium 11/05/1994	42 CK Cook Islandium 15/02/1994	43 LK Sri Lankium 19/08/1994
72 UY Uruguayium 06/10/1994	73 KE Kenyatium 24/07/1994	74 SA Saudi Arabium 09/08/1998	75 OM Omanium 08/02/1995
104 RU Russium 05/11/1997	105 NP Nepalium 18/11/1997	106 VE Venezuelium 03/12/1997	107 MR Mauritanium 09/02/1998
136 MZ Mozambiqium 15/08/2000	137 KI Kiribatum 07/09/2000	138 GA Gabonium 08/09/2000	139 JM Jamalium 08/09/2000
168 NU Niium 21/04/2005	169 GD Grenadium 03/06/2005	170 KH Cambodium 19/07/2005	171 BT Bhutanium 18/08/2005
58 PG Papua New Guinimum 17/04/1996	59 ET Ethiopiium 13/05/1996	60 CR Costaricium 31/05/1996	61 IE Irelanium 24/06/1996
90 SG Singaporium 21/05/1997	91 KW Kuwaitium 29/05/1997	92 GN Guinimum 09/06/1997	93 SI Slovenium 11/06/1997
122 VA Vaticanium 12/05/1999	123 NG Nigerium 20/05/1999	124 SD Sudanium 24/05/1999	125 EE Estonium 26/05/1999
154 AF Africanium 24/06/2003	155 ST Santomium 09/09/2003	156 KG Kyrgyzstanium 29/09/2003	157 CV Capeverdeium 10/10/2003
186 IQ Iraqium 13/01/2000	187 DO Dominicanium 27/03/2000	188 BS Bahamatum 21/04/2000	189 SO Somalium 20/05/2013
26 PT Portugallium 10/09/1996	27 HU Hungarium 31/10/1996	28 PH Phillipinium 11/12/1996	29 BE Belgium 27/01/1997
44 PY Paraguayium 01/12/1994	45 TJ Tadjikistanium 11/01/1995	46 MN Mongolium 17/01/1995	47 FI Finlandium 07/02/1995
76 BH Bahrainium 28/04/1997	77 AM Armenium 27/01/1997	78 LC Saint Lucium 09/04/1997	79 LV Latvium 23/07/1996
108 LT Lithuanium 15/04/1998	109 BJ Beninium 14/05/1998	110 GM Gambium 19/05/1998	111 MW Malawium 11/06/1998
140 YE Yemenium 02/10/2000	141 AE Emiratium 28/11/2000	142 ZM Zambium 09/02/2001	143 DM Dominicium 12/02/2001
172 HN Hondurasium 29/08/2005	173 AG Antigua barbudiium 08/09/2000	174 VU Vanuatum 16/09/2005	175 CD Democronium 09/02/2001
62 BY Belarusium 11/07/1996	63 CL Chilium 12/07/1996	64 NZ Aotearocovium 15/07/1996	65 IN Indium 03/09/1996
94 MK Macedonium 20/06/1997	95 TT Trinibagium 24/06/1997	96 BF Burkina Fasium 06/07/1997	97 GH Ghanium 09/07/1997
126 FM Micronesium 21/06/1999	127 NI Nicaragium 05/11/1999	128 LI Lichtensteinium 24/11/1999	129 SM Sanmarinium 10/12/1999
158 BZ Baltium 01/12/2003	159 LY Libyatium 06/01/2004	160 TV Tuvalium 19/01/2004	161 TD Chadum 13/02/2004
190 SY Syrium 14/09/2013	191 MM Myanmarium 06/07/2015	192 AO Angolium 16/09/2015	193 PS State of Palestinium 17/05/2018
5 5 BG Bulgarium 10/08/1994	6 DE Deutschium 12/08/1994	7 MX Mexicovium 20/08/1994	8 GR Grecium 22/12/1994
13 DZ Algerium 14/08/1995	14 AT Ostariacium 17/08/1995	15 PL Polacovium 23/08/1995	16 JP Japanium 15/09/1995
31 TN Tunisium 15/04/1997	32 TG Togovium 23/04/1997	33 CN Chinatium 25/04/1997	34 US Americanium 25/04/1997
48 CH Switzerium 10/05/1995	49 NL Netherlandium 30/05/1995	50 DK Danmarkium 13/07/1995	51 PE Peruvium 20/07/1995
81 SZ Eswatinium 20/11/1996	82 MV Maldivium 31/05/1994	83 TM Timor Lestium 25/02/1997	84 LS Lesothium 07/12/1994
113 SN Senegalium 20/07/1998	114 BO Bolivium 14/08/1998	115 CY Cyprussium 28/08/1998	116 BW Botswanum 31/08/1998
145 UG Ugandium 30/11/2001	146 VC Vincentium 18/09/2002	147 WS Samoaium 27/09/2002	148 TH Thailandium 10/12/2002
177 HT Haitium 22/02/2006	178 LR Liberium 23/02/2006	179 ME Montenegrium 15/04/2008	180 KM Comorosium 18/08/2006
67 NE Nigeratum 09/04/1997	68 BD Bangladeshium 25/04/1997	69 GQ Egualtorium 25/04/1997	70 KR Koreatum 28/04/1997
99 QA Qatarium 03/09/1997	100 GY Guyanum 12/09/1997	101 PK Pakistanium 28/10/1997	102 JO Jordanium 29/10/1997
131 AZ Azerbaianium 26/02/2000	132 KZ Kazakhstanium 23/03/2000	133 CO Colombium 05/04/2000	134 MY Malaycium 20/04/2000
162 RW Rwandum 31/03/2004	163 MH Marshallium 19/05/2004	164 KN Kittivansium 21/05/2004	165 SB Solomonium 23/09/2004
166 SL Sierraleonium 30/06/2004	167 MG Madagascarium 20/10/2004		



OPCW



United Nations Educational, Scientific and Cultural Organization

2019 IYPT

International Year of the Periodic Table of Chemical Elements

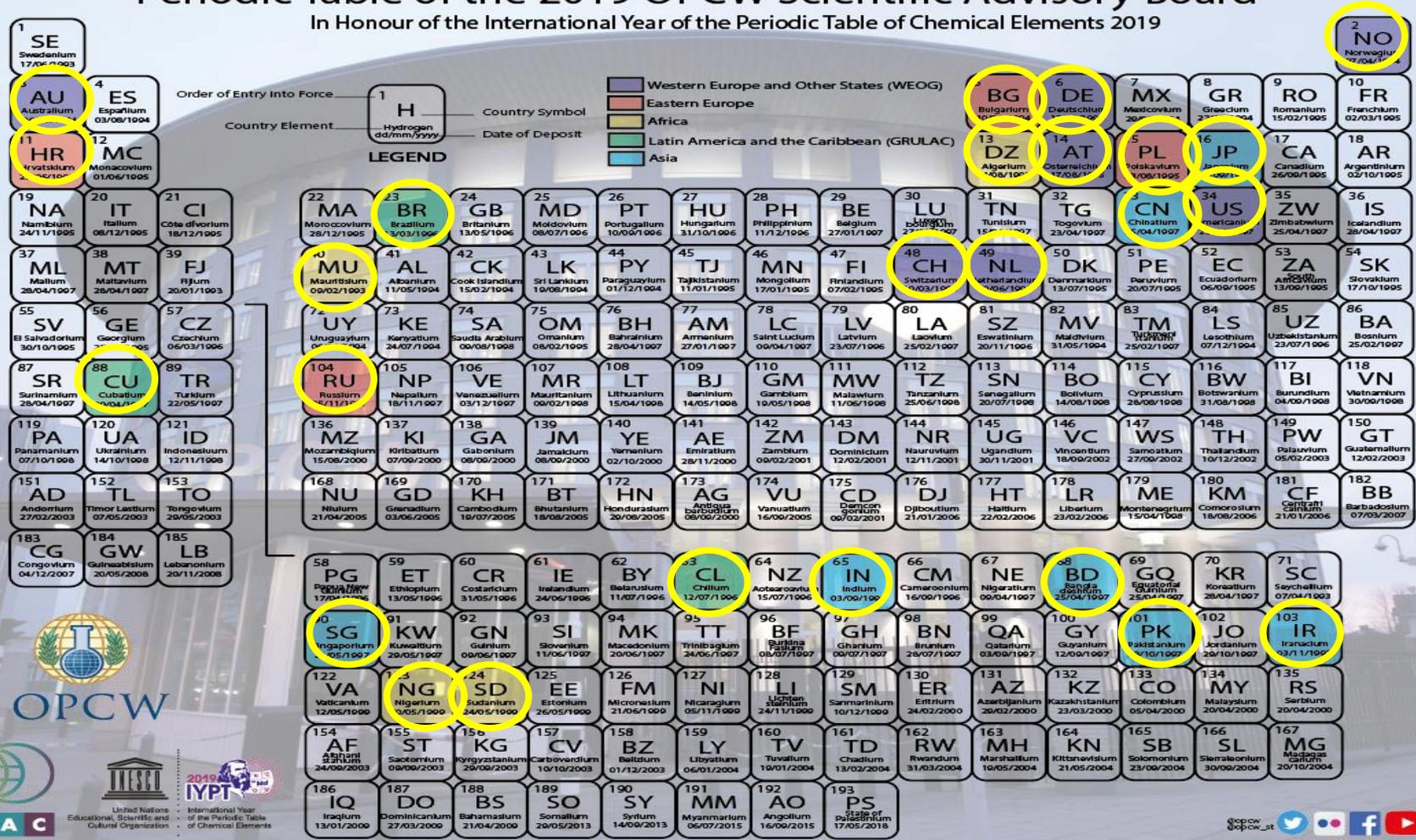


OPCW



Current composition of the SAB

Periodic Table of the 2019 OPCW Scientific Advisory Board In Honour of the International Year of the Periodic Table of Chemical Elements 2019



OPCW

IUPAC

UNESCO

2019 IYPT

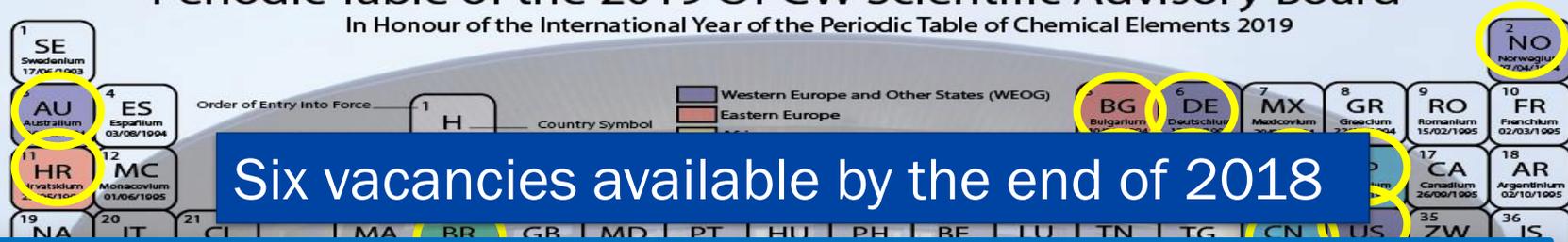
United Nations Educational, Scientific and Cultural Organization

International Year of the Periodic Table of Chemical Elements

@opcw @opcw_tw

Current composition of the SAB

Periodic Table of the 2019 OPCW Scientific Advisory Board In Honour of the International Year of the Periodic Table of Chemical Elements 2019

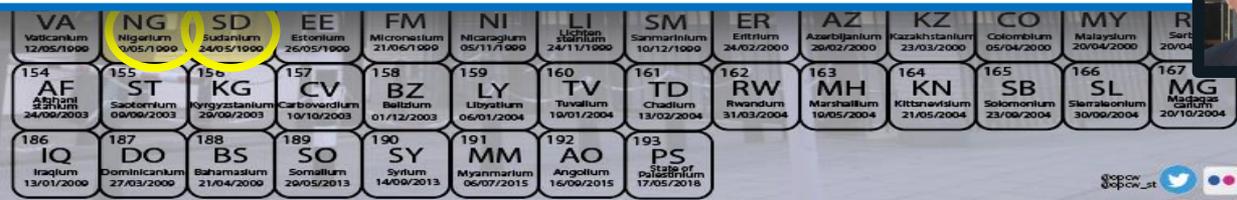


Six vacancies available by the end of 2018

LIST OF SCIENTIFIC ADVISORY BOARD MEMBERS WHOSE TERMS OF OFFICE ARE DUE TO FINISH IN 2019



Name	State Party
Dr Veronica Borrett	Australia
Dr Evandro De Souza Nogueira	Brazil
Mr Cheng Tang	China
Dr Syed K Raza	India
Dr Pål Aas	Norway
Mr Valentin Rubaylo	Russian Federation



Current composition of the SAB

Periodic Table of Chemical Elements 2019

Order of Entry Into Force...

Six vacancies

LIST OF MEMBERS WHOSE TERM OF OFFICE ENDS IN 2019

Name
Dr Veronica Borrett
Dr Evandro De Souza
Mr Cheng Tang
Dr Syed K Raza
Dr Pål Aas
Mr Valentin Rubaylov

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2019 IYPT
International Year of the Periodic Table of Chemical Elements

 **OPCW** Technical Secretariat

S/1702/2019
10 January 2019
Original: ENGLISH

NOTE BY THE TECHNICAL SECRETARIAT

CALL FOR NOMINATIONS TO THE SCIENTIFIC ADVISORY BOARD

- The Technical Secretariat (hereinafter "the Secretariat") wishes to inform States Parties that six members of the Scientific Advisory Board (SAB) will end their term of office on the Board in 2019. These Board members are listed in Annex 1 to this Note. Additionally, two members will be completing their first terms of office on the Board in 2019.
- In the light of the above, the Secretariat invites States Parties to nominate experts, to be appointed by the Director-General after a selection process, to serve on the SAB. The terms of reference (TOR) of the SAB, which are annexed to a decision of the Conference of the States Parties at its Second Session (C-II/DEC.10/Rev.1, dated 2 December 2004), stipulate in paragraph 6 that "[t]he term of office of members of the Board shall be three years. A Board member may serve for two consecutive terms".
- With reference to paragraph 4 of the aforementioned TOR, nominees to be proposed should be eminent persons who serve in research institutions, universities, scientific industries, and/or defence and military organisations, who will be selected on the basis of their expertise in one or more of the particular scientific fields relevant to the implementation of the Chemical Weapons Convention (hereinafter "the Convention"). Paragraph 4 of the SAB's term of reference further stipulates that "[p]reference shall be given to persons who are knowledgeable about the relevant scientific and technological developments, and who are familiar with the implementation of the Convention. Efforts shall be made to maintain a balance between the areas of research, development and applications". Nominees should be proposed on the basis of their qualifications and experience, with States Parties taking into account their publications, scientific, academic or professional activities, distinctions, and international and scientific advisory experience.
- When selecting candidates for nomination, States Parties are encouraged to take into consideration that transdisciplinary ("convergent") scientific practices are a driver for innovation and rapid technological evolution. Candidates whose areas of expertise reach across traditional disciplinary boundaries are particularly well suited to serve on the Board.
- In the light of the expertise held by those leaving the SAB in 2019, the considerations mentioned in paragraphs 3 and 4 above, and the need for technical expert advice on issues that have both immediate and long-term implications for the implementation of

CS-2018-1638(E) distributed 10/01/2019

Periodic Table of Chemical Elements 2019

of 2018

MEMBERS WHOSE TERM OF OFFICE ENDS IN 2019

Dr Veronica Borrett	
Dr Evandro De Souza	
Mr Cheng Tang	
Dr Syed K Raza	
Dr Pål Aas	
Mr Valentin Rubaylov	

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2019 IYPT
International Year of the Periodic Table of Chemical Elements

Current composition of the SAB

Periodic Table of Chemical Elements 2019

1 SE
Swedenium
17/06/1903

2 NO
Norwegianium
19/08/1914

3 AU
Australium
17/06/1903

4 ES
Españium
03/06/1904

6 DE
Deutschium
20/05/2004

7 MX
Mexicovium
20/05/2004

8 GR
Grecium
23/03/2004

9 RO
Romanium
15/02/1905

10 FR
Frenchium
02/03/1905

11 HR
Kroatium
20/05/2004

12 MC
Monacovium
01/06/1905

16 CA
Canadium
26/09/1905

17 AR
Argentium
02/10/1905

Six va

of 2018



OPCW

Technical Secretariat

S/1702/2019

10 January 2019

Original: ENGLISH

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CALL FOR NOMINATIONS TO THE SCIENTIFIC ADVISORY BOARD

1. The Technical Secretariat (hereinafter "the Secretariat") will invite States Parties that six members of the Scientific Advisory Board in 2019. These members will be selected on the basis of their qualifications and experience. Note. Additionally, two members will be selected to serve on the Board in 2019.
2. The Secretariat will invite States Parties to propose nominees to be proposed on the basis of their qualifications and experience, who will be selected on the basis of their qualifications and experience, with States Parties taking into account their publications, scientific, academic or professional activities, distinctions, and international and scientific advisory experience.
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CS-2018-1638(E) distributed 10/01/2019



Deadline for nomination:
30 August 2019

LIST
WHOS

MEMBERS
IN 2019



Dr Veronica B

Dr Evandro

Mr Cheng Ta

Dr Syed K Ra

Dr Pål Aas

Mr Valentin Rubaylc



United Nations Educational, Scientific and Cultural Organization

International Year of the Periodic Table of Chemical Elements

AZ Azerbaijanium 05/02/2000

KZ Kazakhstanium 23/03/2000

CO Colombium 05/04/2000

MY Malaysia 20/04/2000

63 MH Marshallium 0/05/2004

164 KN Kiribanevium 21/05/2004

165 SB Sokomonium 23/09/2004

166 SL Slenzalonium 30/09/2004

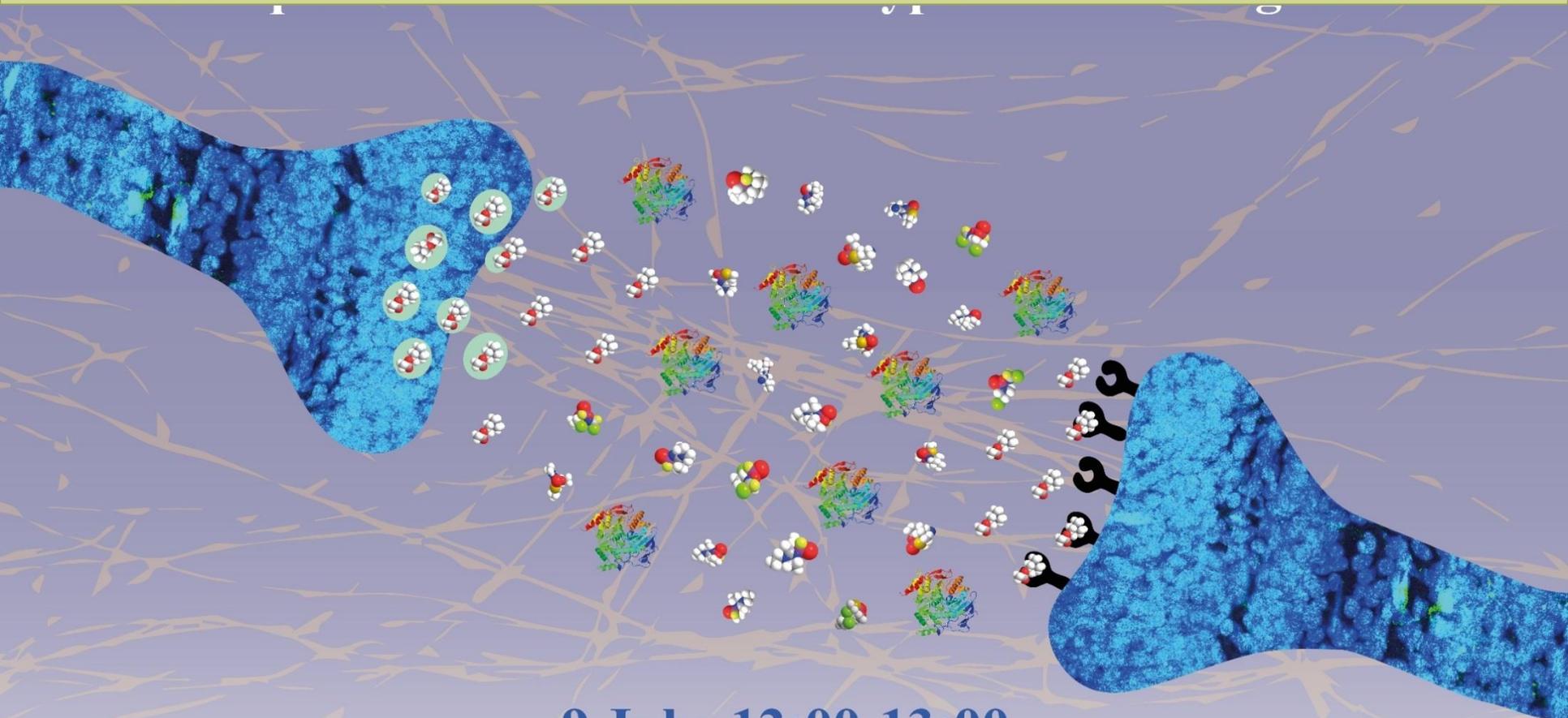
167 MG Madagas Gaiht 20/10/2004

Outline

- **The SAB and its current composition**
- **Updates on activities since the SAB 27**
- **Summary of the SAB 28**
- **SAB's road map to the 5th Review Conference**



Scientific Advisory Board's Response to the Director-General's Request for Advice on New Types of Nerve Agents



9 July, 12:00-13:00
Ieper Room



OPCW

Organisation for the Prohibition of Chemical Weapons

Scientific Advisory Board's Response to the Director-General's Request for Advice on New Types of Nerve Agents

- ❑ In view of the findings of the TAV (March 2018) to the UK, the Director-General was tasked the SAB the followings:
 - to provide advice on toxic chemicals that have been identified as, or are suspected of being, new types of nerve agents
 - to brief SPs/the delegations before the 88th EC Session (11 -13 July 2018)

The DG's requested to the SAB dated 30 April 2018

DIRECTOR-GENERAL'S REQUEST TO THE SCIENTIFIC ADVISORY BOARD TO PROVIDE ADVICE ON NEW TYPES OF NERVE AGENTS

1. Recent events involving the use of nerve agents against individuals in Malaysia and the United Kingdom of Great Britain and Northern Ireland have drawn considerable attention internationally, including in the scientific community. While the Malaysia incident involved a well-known V-series nerve agent, the incident in the United Kingdom involved a highly toxic nerve agent with a structure that has appeared in open literature but has never been declared under the Chemical Weapons Convention. For the chemical identified in the United Kingdom incident, no information has been reported in peer-reviewed scientific literature.
2. The possibility that new types of nerve agents have been developed as weapons has been a topic of discussion for many years among experts outside the OPCW.¹ The toxic chemicals discussed have included organophosphorus structures that would fall under schedule 2B.04 of the Convention's Annex on Chemicals, as well as related organophosphorus structures that would not belong to any of the current schedules. The chemical identified from the United Kingdom incident is not included in the current schedules. As a result of the incident in the United Kingdom, articles are now appearing in scientific society membership publications² and journals³ speculating on the structure and properties of the chemical used and other related chemicals that might have been developed as nerve agents. These publications have broad international distribution.
3. Given the potential relevance of new types of toxic chemicals to the Convention and with a view to preventing the re-emergence of chemical weapons, a clear, factual basis will be needed for future discussions. Information is necessary as background for consideration by States Parties of possible measures to address the potential threat of hostile use of such chemicals.

¹ See paragraphs 11.1 to 11.3 of the report of the Scientific Advisory Board at its Sixteenth Session (SAB-16/1, dated 6 April 2011); www.opcw.org/fileadmin/OPCW/SAB/en/sab-16-01_e.pdf

² See for example (a) American Association for the Advancement of Science: R. Stone; *Science*, 2018, published online 10.1126/science.aar5324; <http://www.sciencemag.org/news/2018/03/uk-attack-shines-spotlight-deadly-nerve-agent-developed-southeast-scientists> (b) American Chemical Society: M. Peplow, *Chem. Eng. News*; 2018, 96(12), 3; <https://cen.acs.org/articles/96/12/Nerve-agent-attack-on-spy-used-Norichok-poison.html> (c) The Royal Society of Chemistry: E. Stove; *Chemistry World*, 13 March 2018; <https://www.chemistryworld.com/news/russian-norichok-nerve-agent-linked-to-attack-on-spy-spy-3008773.article> (d) The University of Melbourne: G. Brantberg; *Pursuit*, 19 March 2018; <https://pursuit.unimelb.edu.au/articles/the-science-behind-norichok> (e) German Chemical Society: D. Wörble; *Chem. Unserer Zeit*; 2018, 52, 71; <https://onlinelibrary.wiley.com/doi/abs/10.1002/ciuz.201870202#>

³ For example: S. Costanzi, J.-H. Machado, M. Mitchell; *ACS Chem. Neurosci.*, 2018, Just Accepted Manuscript. DOI: 10.1021/acscchemneuro.8b00148.

Scientific Advisory Board's Response to the Director-General's Request for Advice on New Types of Nerve Agents

□ In view of the findings of the TAV (March 2018) to the UK, the Director-General was tasked the SA

Correspondence group of 12 SAB members formed on voluntary base

have been identified as, or are suspected of being, new types of nerve agents

➤ to brief SPs/the delegations before the 88th EC Session (11 -13 July 2018)

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Scientific Advisory Board Briefing on the Director-General's Request for Advice on New Types of Nerve Agents



OPCW

Scientific Advisory Board

Twenty-Eighth Session
3 – 7 June 2019

SAB-28/WP.1
3 July 2018
ENGLISH only

RESPONSE TO THE DIRECTOR-GENERAL'S REQUEST TO THE SCIENTIFIC ADVISORY BOARD TO PROVIDE ADVICE ON NEW TYPES OF NERVE AGENTS

1. EXECUTIVE SUMMARY

- 1.1 This report provides advice from the Scientific Advisory Board (SAB) on toxic chemicals that have been identified as, or are suspected of belonging to a new generation of nerve agents in response to a request by the Director-General.¹ This request was initiated following a review of the findings of the March 2018 technical assistance visit (TAV) to the United Kingdom of Great Britain and Northern Ireland.² The TAV had been requested in regard to an incident involving a nerve agent in the city of Salisbury on 4 March 2018 ("the Salisbury Incident").³ The full text of the request to the SAB is contained in the Annex to this report.
- 1.2 The SAB was informed that the chemical identified by authorities in the United Kingdom of Great Britain and Northern Ireland, and confirmed by the TAV had never been declared under the Chemical Weapons Convention (hereinafter, the "Convention"), and did not appear in the Annex on Chemicals.⁴ Public information on the incident described the chemical as a type of nerve agent using the terminology "Novichok" (which means "newcomer"). However, the chemical structure was not made public and speculation from open literature on the identity of the chemical could not be verified.

¹ The Director-General tasked the SAB for advice and also requested that States Parties, in a position to do so, provide information to assist the SAB. See: Note by the Director-General: Request for Information from States Parties on New Types of Nerve Agents; S/1621/2018, dated 2 May 2018; www.opcw.org/fileadmin/OPCW/S_series/2018/en/s-1621-2018_e.pdf

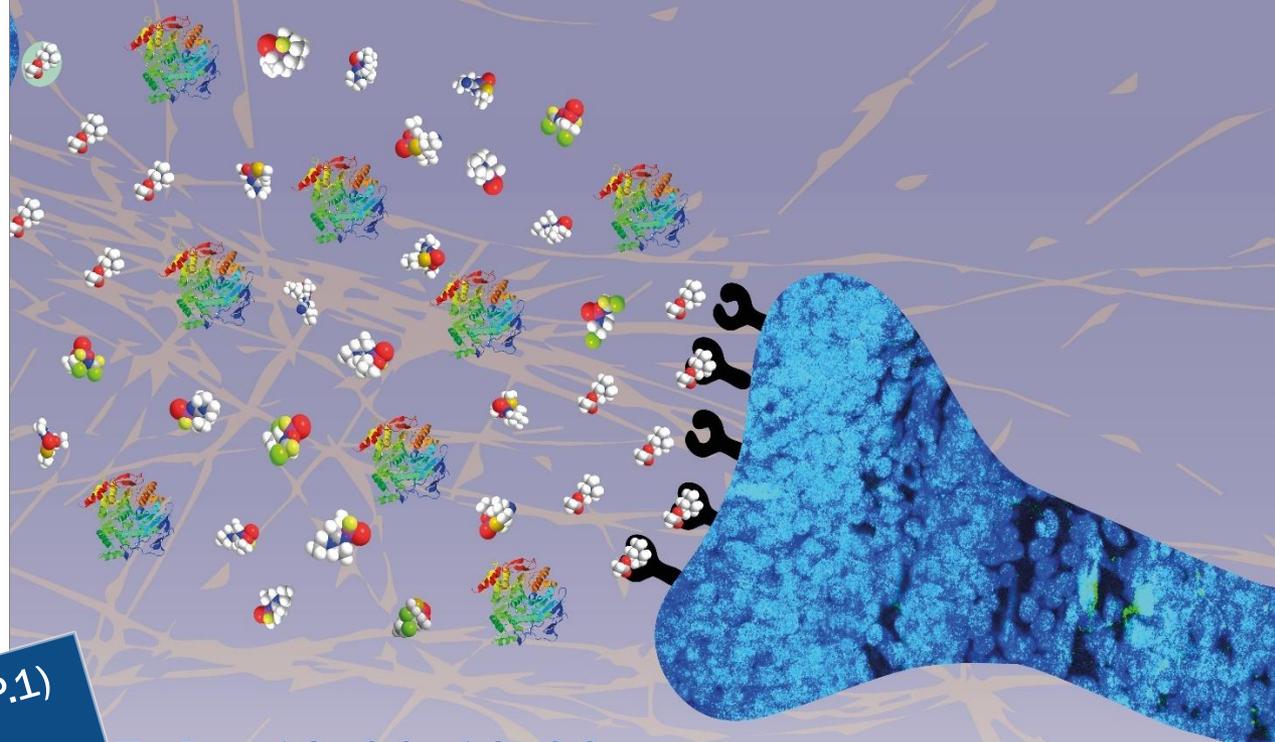
² Note by the Technical Secretariat: Summary of the Report on Activities Carried Out in Support of a Request for Technical Assistance by the United Kingdom of Great Britain and Northern Ireland (Technical Assistance Visit TAV/02/18); S/1612/2018, dated 12 April 2018; www.opcw.org/fileadmin/OPCW/S_series/2018/en/s-1612-2018_e_1.pdf

³ Information from OPCW on the Salisbury Incident is available at: www.opcw.org/special-sections/salisbury-incident/

⁴ Annex on Chemicals, *Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction*, Organisations for the Prohibition of Chemical Weapons, The Hague, 1997; www.opcw.org/chemical-weapons-convention/annexes/annex-on-chemicals/. Chemical structure guide available at: www.opcw.org/fileadmin/OPCW/Science_Technology/Guide_to_Schedules.pdf

⁵ Due to OPCW confidentiality requirements, the SAB was not provided with information on the name or structure of the chemical contained within the Salisbury Incident TAV report.

CS-2018-1163(E) distributed 03/07/2018



Final Report (SAB-28/WP.1)
Issued 3 July 2018

July, 12:00-13:00
Jeper Room



Organisation for the Prohibition of Chemical Weapons

Scientific Advisory Board Briefing on the Director-General's Request for Advice on New Types of Nerve Agents



OPCW

Organisation for the Prohibition of Chemical Weapons

The Director-General's Request to the Scientific Advisory Board to Provide Advice on New Types of Nerve Agents

*Briefing to States Parties
The Hague, 9 July 2018*

Cheng Tang

SAB Vice Chair/2019 Chair Elect

Jonathan E. Forman, Ph.D.

Science Policy Adviser and Secretary to the Scientific Advisory Board



Scientific Advisory Board Briefing on the Director-General's Request for Advice on New Types of Nerve Agents



OPCW
Organisation for the Prohibition of Chemical Weapons

The Director-General's
Scientific Advisory Board
Advice on

Science Policy

Scheduled Chemicals under the Chemical Weapons Convention (CWC)

Schedule 1

Guidelines for Schedule 1

The following criteria shall be taken into account in considering whether a toxic chemical or precursor should be included in Schedule 1:

- It has been developed, produced, stockpiled or used as a chemical weapon as defined in Article II;
- It poses otherwise a high risk to the object and purpose of this Convention by virtue of its high potential for use in activities prohibited under this Convention because one or more of the following conditions are met:
 - It possesses a chemical structure closely related to that of other toxic chemicals listed in Schedule 1, and has, or can be expected to have, comparable properties;
 - It possesses such lethal or incapacitating toxicity as well as other properties that would enable it to be used as a chemical weapon;
 - It may be used as a precursor in the final single technological stage of production of a toxic chemical listed in Schedule 1, regardless of whether this stage takes place in facilities, in reactions or elsewhere;
 - It has little or no use for purposes not prohibited under this Convention.

Schedule 2

Guidelines for Schedule 2

The following criteria shall be taken into account in considering whether a toxic chemical not listed in Schedule 1 or a precursor to a Schedule 1 chemical or to a chemical listed in Schedule 1, part A, should be included in Schedule 2:

- It poses a significant risk to the object and purpose of this Convention because it possesses such lethal or incapacitating toxicity as well as other properties that would enable it to be used as a chemical weapon;
- It may be used as a precursor in one of the chemical reactions at the final stage of formation of a chemical listed in Schedule 1 or Schedule 1, part A;
- It poses a significant risk to the object and purpose of this Convention by virtue of its importance in the production of a chemical listed in Schedule 1 or Schedule 1, part A;
- It is not produced in large commercial quantities for purposes not prohibited under this Convention.

Schedule 3

Guidelines for Schedule 3

The following criteria shall be taken into account in considering whether a toxic chemical or precursor, not listed in other Schedules, should be included in Schedule 3:

- It has been produced, stockpiled or used as a chemical weapon;
- It poses otherwise a risk to the object and purpose of this Convention because it possesses such lethal or incapacitating toxicity as well as other properties that might enable it to be used as a chemical weapon;
- It poses a risk to the object and purpose of this Convention by virtue of its importance in the production of one or more chemicals listed in Schedule 1 or Schedule 1, part B;
- It may be produced in large commercial quantities for purposes not prohibited under this Convention.

In line with Scientific Advisory Board recommendations to the Fourth Review Conference about chemicals, consideration of whether any changes to the Schedules, involving new nerve agents and their precursors, would be warranted to ensure appropriate restrictions on, and monitoring of, such chemicals.

ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS
Working Together for a World Free of Chemical Weapons

Relationship between Schedules. Illustrated with sulfur mustard.

Number of Publications

Publication Year

Scheduled chemicals including those in schedules 1 and 2, cite their scientific and economically important uses. This chart captures the number of peer-reviewed publications that cite its uses.

Scientific Advisory Board Briefing on the Director-General's Request for Advice on New Types of Nerve Agents



OPCW
Organisation for the Prohibition of Chemical Weapons

The Director-General's
Scientific Advisory Board
Advice on

Scheduled Chemicals under the Chemical Weapons Convention (CWC)

Schedule 1

Guidelines for Schedule 1

The following criteria shall be taken into account in considering whether a toxic chemical or precursor should be included in Schedule 1:

- (i) it has been developed, produced, stockpiled or used as a chemical weapon as defined in Article II;
- (ii) it poses otherwise a high risk to the object and purpose of this Convention by virtue of its high potential for use in activities prohibited under this Convention because one or more of the following conditions are met:
 - (a) it possesses a chemical structure closely related to that of other toxic chemicals listed in Schedule 1, and has, or can be expected to have, comparable properties;
 - (b) it possesses such lethal or incapacitating toxic properties that would enable it to be used as a chemical weapon;
 - (c) it may be used as a precursor in the production of such toxic chemicals;

Schedule 2

Guidelines for Schedule 2

The following criteria shall be taken into account in considering whether a toxic chemical not listed in Schedule 1, or a precursor to a Schedule 1 chemical or to a chemical listed in Schedule 2, part A, should be included in Schedule 2:

- (i) it poses a significant risk to the object and purpose of this Convention because one or more of the following conditions are met:
 - (a) it possesses such lethal or incapacitating toxic properties that would enable it to be used as a chemical weapon;
 - (b) it may be used as a precursor in the production of such toxic chemicals;

Schedule 3

Guidelines for Schedule 3

The following criteria shall be taken into account in considering whether a toxic chemical not listed in Schedule 1, or a precursor to a Schedule 1 chemical or to a chemical listed in Schedule 2, part A, should be included in Schedule 3:

- (i) it poses a significant risk to the object and purpose of this Convention because one or more of the following conditions are met:
 - (a) it possesses such lethal or incapacitating toxic properties that would enable it to be used as a chemical weapon;
 - (b) it may be used as a precursor in the production of such toxic chemicals;

Article XV Proposals submitted by States Parties to be continued...

Recommendations to the Fourth Review Conference on the consideration of whether any changes to the Convention regarding new nerve agents and their precursors, would be warranted to ensure appropriate restrictions on, and monitoring of, such chemicals.

ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS
Working Together for a World Free of Chemical Weapons

Relationship between Schedules. Illustration with sulfur mustard.

Schedule 2 (Precursor) → Sulfur mustard (Schedule 1) → Sulfur mustard (Schedule 1)

Number of Publications vs. Publication Year

SAB's report to the 4th Review Conference

21 – 30 November 2018, World Forum, The Hague



OPCW

SAB's report to the 4th Review Conference



OPCW

Review Conference

Fourth Session
21 – 30 November 2018

RC-4/DG.1
30 April 2018
Original: ENGLISH

REPORT OF THE SCIENTIFIC ADVISORY BOARD ON DEVELOPMENTS IN SCIENCE AND TECHNOLOGY FOR THE FOURTH SPECIAL SESSION OF THE CONFERENCE OF THE STATES PARTIES TO REVIEW THE OPERATION OF THE CHEMICAL WEAPONS CONVENTION

Introduction

1. The Scientific Advisory Board (SAB) was established by the Director-General in accordance with subparagraph 21(b) and paragraph 45 of Article VIII of the Chemical Weapons Convention (hereinafter "the Convention"), so that he could render to the Conference of the States Parties (hereinafter "the Conference") and the Executive Council (hereinafter "the Council") specialised advice in areas of science and technology relevant to the Convention. In keeping with this mandate, and as its contribution to the Fourth Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention (hereinafter "the Fourth Review Conference"), to be held from 21 to 30 November 2018, the SAB has prepared this report, which analyses relevant developments in science and technology over the past five years and presents recommendations and observations that the SAB considers to be important for the review of the operation of the Convention and its future implementation.
2. This report contains an executive summary and recommendations addressing issues that may impact the implementation of the Convention and the work of the Technical Secretariat (hereinafter "the Secretariat"). The analysis of developments in science and technology that informed the recommendations, as well as additional, more detailed recommendations, are provided in Annex 1.
3. This is the fourth report for a Review Conference by the SAB on developments in science and technology relevant to the Convention. The three earlier reports were presented to the First Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention¹ (hereinafter "the First Review Conference"), the Second Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention² (hereinafter "the Second Review Conference"), and the Third Special Session of the Conference

¹ RC-1/DG.2, dated 23 April 2003.

² RC-2/DG.1, dated 28 February 2008 and Corr. 1, dated 5 March 2008.

18, World Forum, The Hague

Third Special Session of the
Conference of the States
Parties to Review the
Operation of the Chemical
Weapons Convention
8 – 15 April 2013
Organisation for the Prohibition of Chemical Weapons

83 pages

product of 5 years' intensive
review process



OPCW

SAB's report to the 4th Review Conference

Scientific Advisory Board's Recommendations to the Fourth Review Conference of the Chemical Weapons Convention



recommendations
focused on 8 thematic areas

A quick reference guide to the executive summary recommendations of the OPCW Scientific Advisory Board's report on developments in science and technology to the Fourth Review Conference (RC-4/DG.1, dated 30 April 2018).



Download RC-4/DG.1



OPCW

SAB's report to the 4th Review Conference



OPCW

Review Conference

Fourth Session
21 – 30 November 2018

RC-4/3/Rev.1
30 November 2018
Original: ENGLISH

CHAIRPERSON'S REPORT OF THE PROCEEDINGS OF THE FOURTH SPECIAL SESSION OF THE CONFERENCE OF THE STATES PARTIES TO REVIEW THE OPERATION OF THE CHEMICAL WEAPONS CONVENTION (FOURTH REVIEW CONFERENCE)

The Chairperson of the Fourth Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention (hereinafter "the Fourth Review Conference") issues this report under the general powers of the presiding officer (Rule 50 of the Rules of Procedure of the Conference of the States Parties). Before presenting this report the Chairperson submitted a Draft Informal Report on the Review of the Operation of the Chemical Weapons Convention for the consideration of the Fourth Review Conference. Based on comments received, he concluded that, despite broad consultations and best efforts, consensus could not be achieved. The Review Conference worked on the principle that nothing was agreed until everything was agreed.



Download RC-4/DG.1



OPCW

SAB's report to the 4th Review Conference



Fourth Session
21 – 30 November

CHAIRPERSON
SESSION OF THE
OPE

The Chairperson of the Review of the Operation of the Conference”) issued the Rules of Procedure. The Chairperson stated that the Chairperson of the Chemical Weapons Convention. Based on comments, a consensus could not be reached and nothing was agreed.

9.23 The Fourth Review Conference acknowledged the impact of scientific and technological progress on the effective implementation of the Convention and the importance for the OPCW and its policy-making organs of taking due account of such developments. In that context, it stressed that the Scientific Advisory Board (SAB) should continue its role in advising the Director-General and noted the report of the SAB prepared for the Fourth Review Conference (RC-4/DG.1, dated 30 April 2018), as well as the response by the Director-General thereto (RC-4/DG.2, dated 1 June 2018). It requested the Director-General and the Council to take into account the recommendations made therein.

9.45 The Fourth Review Conference noted that the verification system should continue to be improved and adapted in a manner consistent with the Convention in response to advances in science and technology, taking into consideration, as appropriate, the SAB's advice to the Director-General, as circulated to the Council and the Review Conference.

9.84 The Fourth Review Conference welcomed the increased engagement of the SAB and the Secretariat with other scientific advisory boards, scientific communities and relevant international organisations, including security focused ones, to explore scientific and technological issues and share experiences to achieve the object and the purpose of the Convention.

9.86 The Fourth Review Conference acknowledged the establishment of “The Hague Ethical Guidelines”, which constitute an important step to advance understanding among chemistry practitioners of the importance of nurturing responsible and ethical norms for scientific research and development.



OPCW

SAB's report to the 4th Review Conference



Fourth Session
21 – 30 November 2018

CHAIRPERSONS
SESSION

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9.84 The Fourth Review Conference welcomed the increased engagement of the SAB and the Secretariat with other scientific advisory boards, scientific communities and relevant international organisations, including security focus initiatives, to explore scientific and technological issues and share expertise to achieve the object and the purpose of the Convention. **Chairpersons Report encouraged these initiatives to continue**

9.86 The Fourth Review Conference acknowledged the establishment of “The Hague Ethical Guidelines”, which constitute an important step to advance understanding among chemistry practitioners of the importance of nurturing responsible and ethical norms for scientific research and development.



OPCW

Remarks from Individual States Parties



OPCW

Review Conference

Fourth Session
21 – 30 November 2018

RC-4/NAT.11
23 November 2018
ENGLISH only

**Positive comments
and support**

BULGARIA

**STATEMENT BY H.E. AMBASSADOR KRASSIMIR KOSTOV
PERMANENT REPRESENTATIVE OF THE REPUBLIC OF BULGARIA
TO THE OPCW AT THE FOURTH SPECIAL SESSION OF THE
CONFERENCE OF THE STATES PARTIES TO REVIEW
THE OPERATION OF THE CHEMICAL WEAPONS**

On the eve of the 150th anniversary of the Mendeleev Table, which we will celebrate next year, we have a special word of gratitude to all colleagues from the OPCW and, in particular, to Dr Jonathan Forman, OPCW Science Policy Adviser and Secretary to the SAB, for naming the fifth element on the just published Periodic Table of the States Parties to the Chemical Weapons Convention “Bulgarium” in recognition of the fact that my country was the fifth to join the Chemical Weapons Convention.

Words from all paragraphs from national papers that mentioned “science” and/or “scientific” (31 individual States Parties, 4 Joint Papers; out of 73 available submissions in 4th Review Conference)



OPCW

TWG on Investigative Science and Technology



ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS

Working Together For a World Free of Chemical Weapons

Temporary Working Group on Investigative Science and Technology

Reporting to the Scientific Advisory Board (SAB), the Temporary Working Group (TWG) will in particular consider the following questions:

Question 1:

Which methods and capabilities used in the forensic sciences could usefully be developed and/or adopted for Chemical Weapons Convention-based investigations?



Question 2:

What are the best practices and analysis tools used in the forensic sciences for effectively cross-referencing, validating, and linking together information related to investigation sites, materials collected/analysed, and individuals interviewed?



Question 3:

What are the best practices for management of data collected in investigations, including compilation, curation, and analytics?



Question 4:

What are the best practices for the collection, handling, curation and storage, and annotation of evidence?



Question 5:

Which technologies and methodologies (whether established or new) allow point-of-care and non-destructive measurements at an investigation site to help guide evidence collection?



Question 6:

Which technologies and methodologies (whether established or new) can be used in the provenancing of chemical and/or material samples collected in an investigation?



Question 7:

Which methods are available (or are being developed) for the sampling and analysis of environmental and biomedical materials and can be used in the detection of toxic industrial chemicals relevant to the Chemical Weapons Convention?



Question 8:

Which technologies and methodologies (whether established or new) can be used in ensuring chain of custody and verifying authenticity (especially in regard to digital images and video recordings)?



Question 9:

Which technologies and methodologies (whether established or new) can be used to ensure the integrity of an investigation site?



Question 10:

Do collections of physical objects, samples, and other information for chemical weapons-related analysis exist and can they be made available to investigators for retrospective review? How might these collections be used to support investigations?

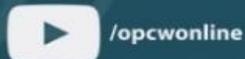


Question 11:

Are there stakeholders that the Technical Secretariat could usefully engage with to leverage their capabilities on investigative matters?



In addition, the TWG will provide advice on Technical Secretariat proposals for methodologies, procedures, technologies, and equipment for investigative purposes.



TWG on Investigative Science and Technology



Dr. Veronica Borrett

2nd meeting , 14 November 2018

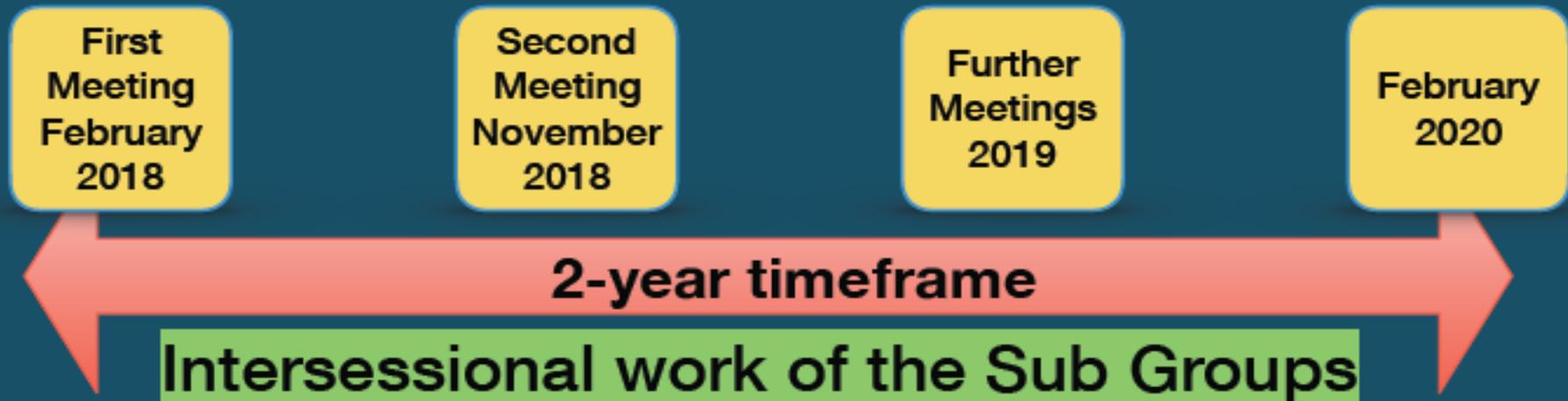
TWG on Investigative Science and Technology

TIMELINE

- ▶ First meeting was held 12 to 14 February 2018
- ▶ Second meeting was held 14 to 16 November 2018
- ▶ Third meeting 2 to 4 April 2019

REPORTING

- ▶ Report to the SAB
- ▶ Potential for Interim Report
- ▶ Potential for DG request to SAB for Advice



TWG on Investigative Science and Technology

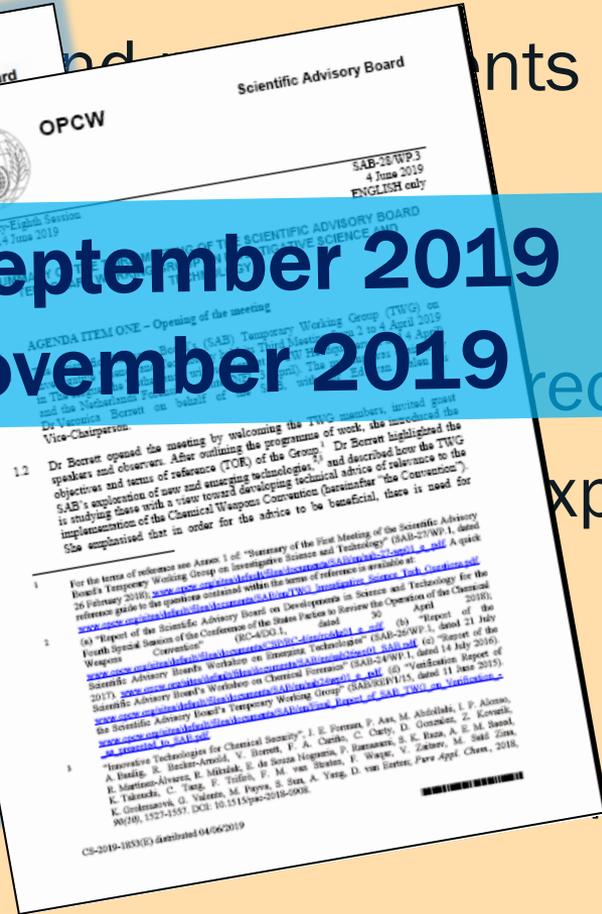
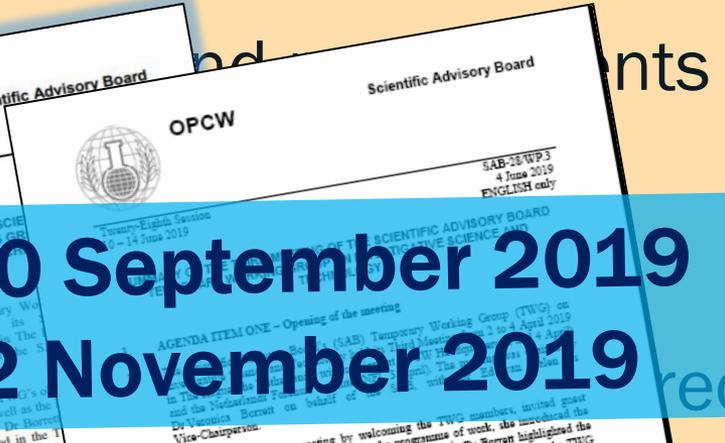
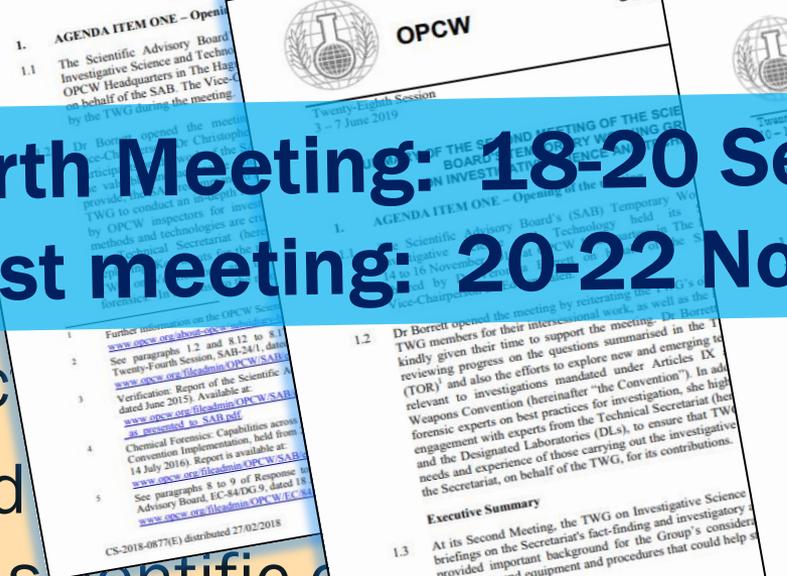
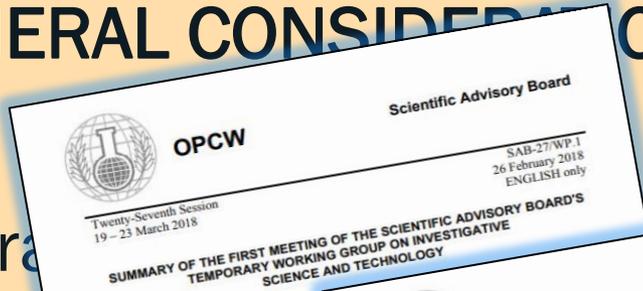
■ GENERAL CONSIDERATIONS

- Operational context - challenges and requirements
- Laboratory capabilities
- Current best-practice and SOPs
- What new capabilities and connections are required?
- Connections with forensic community and other experts
- Forward thinking and emerging technologies from broader scientific community
- Approaches to combine multiple information streams

TWG on Investigative Science and Technology

GENERAL CONSIDERATIONS

- Operational
 - Laboratory
 - Cultural
 - What
 - Connect
 - Forward
 - broader scientific
 - Approaches to con
- Fourth Meeting: 18-20 September 2019
- Last meeting: 20-22 November 2019
- Experts
- nts
- red?
- ns



Engagement with the BWC communities



BTWC MX2- 9-10 August 2018, Geneva

Engagement with the BWC communities



Shared experience on
“The Hague Ethical Guidelines”



Engagement with the BWC communities



CBW Events
@CBWEvents

@OPCW breakfast side event on Disarmament and Technological Change #1972BWC #BWCMX #BWCMX2 @OPCW_ST #SciTech

翻译自英语

A poster for an OPCW side event. The title is 'Disarmament and Technological Change'. Below it, it says 'An OPCW Side Event at BWC MX2' and 'A Review of Developments in Science and Technology Relevant to the Chemical and Biological Weapons Conventions'. The event is scheduled for 13:00 - 15:00 on Thursday, 9 August 2018. The poster features a blue background with a globe, chemical structures, and gears. It includes the OPCW logo and a QR code for downloading a report (RC-4/DG.1).

OPCW
Organisation for the Prohibition of Chemical Weapons

Disarmament and Technological Change

An OPCW Side Event at BWC MX2
A Review of Developments in Science and Technology Relevant to the Chemical and Biological Weapons Conventions

13:00 - 15:00
Thursday, 9 August 2018

Scientific Advisory Board's Recommendations to the Fourth Review Conference of the Chemical Weapons Convention

Download RC-4/DG.1



Side events at ECs & RC4



Science for Diplomats Initiative

Delegates taking part in OPCW's interactive Science for Diplomats initiative

Side events at ECs & RC4

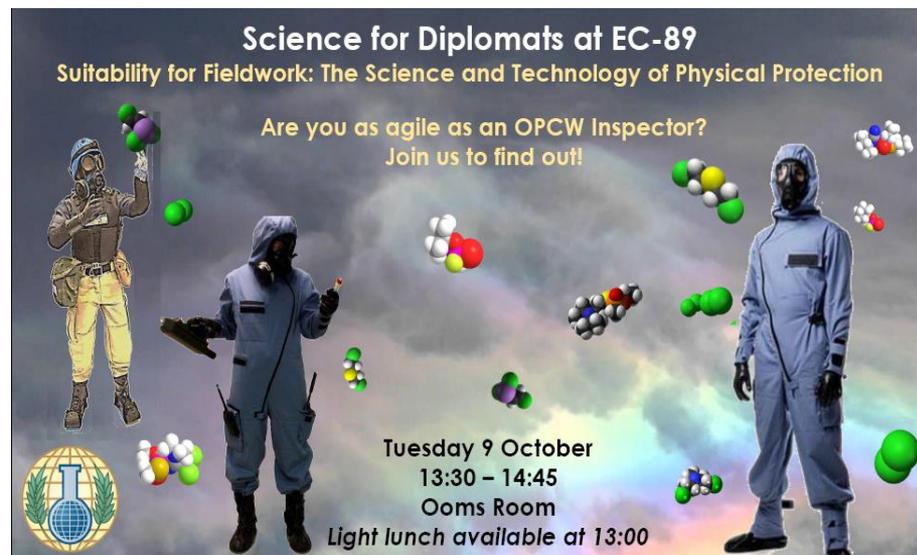
Science for Diplomats at EC-88
The Chemical Universe: Scheduled and Unscheduled



Tuesday, 10 July 2018
Ooms Room, OPCW
13:30 - 14:45
Light lunch served at 13:00

Science for Diplomats at EC-89
Suitability for Fieldwork: The Science and Technology of Physical Protection

Are you as agile as an OPCW Inspector?
Join us to find out!



Tuesday 9 October
13:30 - 14:45
Ooms Room
Light lunch available at 13:00

SCIENCE FOR DIPLOMATS
Tuesday 12 March 2019
Ooms Room 13:30 - 14:45
Light Lunch Available at 13:00

AT EC-90

The Expanding Chemical Universe: From C1 to C10 and beyond



A lunch time mission to boldly go
where no delegation has gone before...

Science for Diplomats at RC-4
and the Spiez Laboratory Present:

Convergence
and Solving Chemical Mysteries

a Transdisciplinary Look
at Scientific Advances
and Problem Solving



Friday, 23 November 2018
13:00 - 15:00 Europe Room World Forum
Light lunch provided

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Science for Diplomats: EC 88



OPCW SciTech
@OPCW_ST

Join us at EC-88 for [#ScienceforDiplomats](#), a journey across the chemical universe & a look at the [@OPCW](#) Scientific Advisory Board [#CWCR4](#) recommendations on schedules.

翻译自英语

Science for Diplomats at EC-88
The Chemical Universe: Scheduled and Unscheduled

Tuesday, 10 July 2018
Ooms Room, OPCW
13:30 - 14:45
Light lunch served at 13:00

18年6月12日, 23:08

Explore the Chemical Universe

Scan  with your phone,

Press ,
insert your phone and
enjoy!



Science for Diplomats: EC 88



OPCW

Organisation for the Prohibition of Chemical Weapons

The Chemical Universe: Scheduled and Unscheduled

*Science for Diplomats at EC-88
The Hague, 10 July 2018*

Cheng Tang,; 2019 SAB Chair Elect

Christopher Timperley, Ph.D.; SAB Chair

Jonathan E. Forman, Ph.D.; Science Policy Adviser and SAB Secretary

Mr Joel De Saint Ours, Ms Siqing Sun, and Mr Vivek Suri

Support Staff, Office of Strategy and Policy

Science for Diplomats: EC 88

Scheduled Chemicals under the Chemical Weapons Convention (CWC)

Schedule 1

Schedule 1

Schedule 1

Schedule 3

Scheduled Chemicals under the Chemical Weapons Convention (CWC)

Schedule 2

Schedule 2

Schedule 2 Part A, Toxic Chemicals

Schedule 3

Answers from the Audience

How many chemicals are contained within the Schedules?

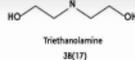
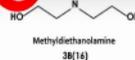
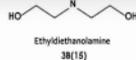
Mentimeter

100000 250
100000 failed
40000 too many
3 millions chemistry
infinity endless 300
2400
1000000 lots
numbers 150 tens of thousands

18



OPCW
ORGANIZATION FOR
PROHIBITION OF
CHEMICAL WEAPONS



OPCW

120 1201 Chemicals that are not on the Convention's list but are nevertheless prohibited under the Convention
121 1202 Chemicals that are not on the Convention's list but are nevertheless prohibited under the Convention
122 1203 Chemicals that are not on the Convention's list but are nevertheless prohibited under the Convention

123 1204 Chemicals that are not on the Convention's list but are nevertheless prohibited under the Convention
124 1205 Chemicals that are not on the Convention's list but are nevertheless prohibited under the Convention

Science for Diplomats: EC 89

Suitability for Fieldwork: The Science and Technology of Physical Protection

Are you as agile as an OPCW Inspector?
Join us to find out!



Tuesday 9 October
13:30 – 14:45
Ooms Room
Light lunch available at 13:00



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Science for Diplomats: EC 89

And Now... Your Chance to Hear Directly from the Inspectors



Science for Diplomats: EC 89



Science for Diplomats: EC 89



What do you know about PPE?



Answers from Participants

Tell us what you know about PPE?

Mentimeter



Science for Diplomats: EC 89



Science for Diplomats: EC 89



Science for Diplomats: EC 89



Heidemaria Gürer @heidiguerer · 2018年10月9日

#OPCW Science for Diplomats; Informative as always - this time well protected!



Scientific Advisory Board's Recommendations to the Fourth Review Conference of the Chemical Weapons Convention



Science for Diplomats: RC4

Science for Diplomats at RC-4 and the Spiez Laboratory Present:

**Convergence
and Solving Chemical Mysteries**

**a Transdisciplinary Look
at Scientific Advances
and Problem Solving**

Friday, 23 November 2018

13:00 -15:00 Europe Room World Forum

Light Lunch provided



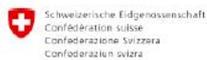
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Science for Diplomats: RC4



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Office for Civil Protection FOCP
SPIEZ LABORATORY

Spiez CONVERGENCE 2018

S&T @ crossroad of chemistry and biology
RC-4, Science for Diplomats, 23 Nov. 2018

Stefan Mogl, Beat Schmidt Spiez Laboratory



Spiez CONVERGENCE workshop series 2014 / 2016 / 2018



- Explore S&T challenges to CWC and BWC
- 3rd Review of S&T at intersection of biology and chemistry
- Participants from academia, industry, arms control

https://www.labor-spiez.ch/pdf/ue/Spiez_Convergence_2014_web.pdf
https://www.labor-spiez.ch/pdf/en/Report_on_the_second_workshop-5-9_September_2016.pdf

Federal Office for Civil Protection FOCP
SPIEZ LABORATORY

Science for Diplomats: RC4



TEMPORARY WORKING GROUP (TWG) ON INVESTIGATIVE SCIENCE AND TECHNOLOGY

Dr Veronica Borrett, Member, SAB
Chair, TWG on Investigative Science and Technology



OPCW TWG on Investigative Science and
Technology Second Meeting
14 to 16 November 2018

TWG ON INVESTIGATIVE SCIENCE AND TECHNOLOGY

TECHNOLOGY SOLUTIONS

- ▶ The ability to access and apply new technology solutions for evaluating and documenting a scene or equipment, and detection and sampling.
 - ▶ help highlight sampling hotspots (the best place to take a sample)
 - ▶ can reduce the number of samples and increase their utility, reduce logistic burden and workload for OPCW lab and DL
 - ▶ increase effectiveness of time spent at the scene
 - ▶ support risk assessment for inspectors
 - ▶ support planning to reduce the time required at a scene - e.g. to reduce hazards that may be associated with working in personal protective equipment
- ▶ Robust forensic methods to ensure the integrity of information and sampled materials
 - ▶ Best practice for chain of custody, scene documentation, detection and analysis
- ▶ Site assessment, documentation, sampling and analysis, and Chain of Custody may benefit from the application of technology solutions, such as:
 - ▶ UGV/UAVs,
 - ▶ imaging (particularly satellite imaging),
 - ▶ 3D and 2D scanning, and
 - ▶ inclusion of RFIDs (i.e. electronic tags) for monitoring, tracking and Chain of Custody.

Science for Diplomats: RC4



Science for Diplomats: RC4



Science for Diplomats: RC4

The world in the age of Industry 4.0

Massive Connectivity

Data the "New Oil"

Increased Transparency

Quantification and Profiling

Mass Customization

Sharing

BASF
The World Community



Science for Diplomats: RC4

Side event on Digitalization

Renate Backer-Arnold (SAB Member):

Leading the digital transformation in chemicals



Science for Diplomats: EC 90

SCIENCE FOR DIPLOMATS *AT EC-90*

Tuesday 12 March 2019
Ooms Room 13:30 - 14:45
Light Lunch Available at 13:00

The Expanding Chemical Universe: From C1 to C10 and beyond



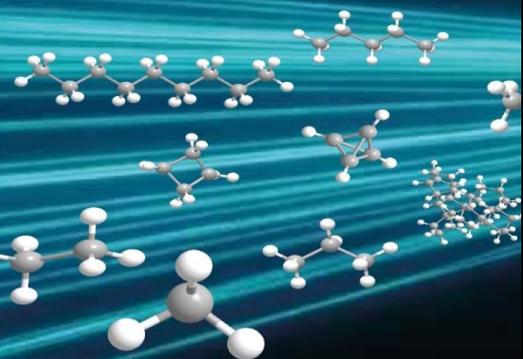
OPCW

Science for Diplomats: EC 90

SCIENCE

Tuesday 12 March 2019
Ooms Room
Light Lunch 12:30-1:30

The Expanding Chemical Universe



A lunch time presentation where no deleterious chemical is left out

Expanding Chemical Universe Bingo

Listen to the presentation. If you hear any word from the chart below, mark it! 5 in a row in any direction, it's a BINGO! Hold up your molecule and get your prize. Middle space is a free word.

Cycloalkyl	Isomers	Nuances	Plastic parts	Schedule 3
Carbons	Ice cream	Molecules	Proposal	Universe
Cycle	Group		Periodic table	Sulfur
Article	Enzyme	Nested	Precursors	Toxicity
Alkyl	Fluorine	Nomenclature	Phosphonamido	Unscheduled

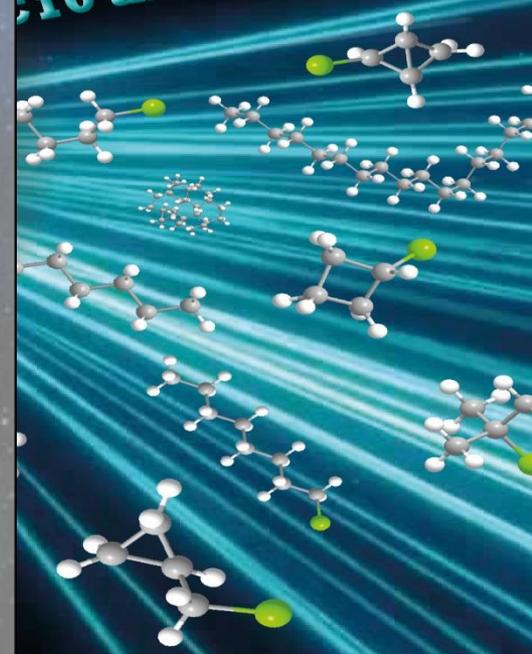
SCIENCE FOR DIPLOMATS
AT EC-90 Tuesday 12 March 2019



OPCW

DIPLOMATS
EC-90

10 and beyond



OPCW

Science for Diplomats: EC 90



OPCW

Organisation for the Prohibition of Chemical Weapons

The Expanding Chemical Universe: From C1 to C10 and Beyond

Science for Diplomats at EC-90

The Hague, 12 March 2019

Starring:

Mr Cheng Tang, SAB Chair

Dr Jonathan E. Forman, Science Policy Adviser and SAB Secretary

Mr Peter Brud, Ms Maria Hemme, and Ms Giovanna Pontes

Office of Strategy and Policy

With special guest star Ms Andrea Dymytrva



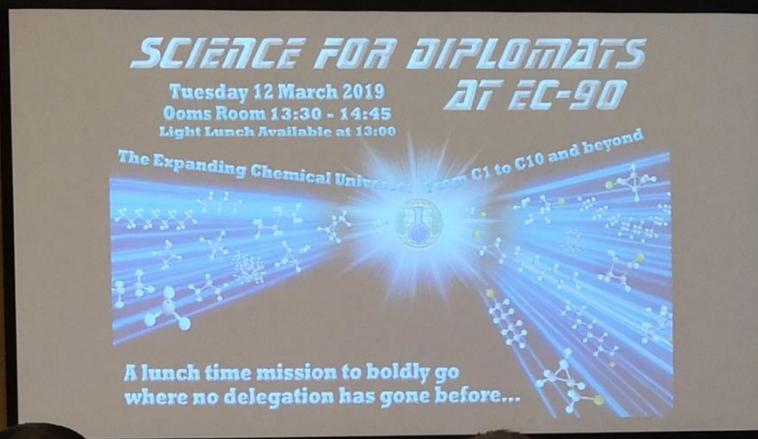
OPCW

SCIENCE FOR DIPLOMATS
AT EC-90 Tuesday 12 March 2019



OPCW

Science for Diplomats: EC 90



Science for Diplomats Crew at EC 90

Maintaining Visibility: Peer-Reviewed Publications

RSC Advances



REVIEW

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Check for updates

Advice from the Scientific Advisory Board of the Organisation for the Prohibition of Chemical Weapons on riot control agents in connection to the Chemical Weapons Convention†

Christopher M. Timperley,¹ Jonathan E. Forman,² Pal Aas,³ Mohammad Abdollahi,⁴ Djafer Benachour,⁵ Abdullah Saeed Al-Amri,⁶ Augustin Baulig,⁷ Renate Becker-Arnold,⁸ Veronica Borrett,⁹ Flerida A. Cariño,¹⁰ Christophe Curty,¹¹ David Gonzalez,¹² Michael Geist,¹³ William Kane,¹⁴ Zrinka Kovarik,¹⁵ Roberto Martínez-Álvarez,¹⁶ Robert Mikulak,¹⁷ Nícia Maria Fusaro Mourão,¹⁸ Slawomir Neffe,¹⁹ Evandro De Souza Nogueira,²⁰ Ponnadurai Ramasami,²¹ Tang,²²

Talanta 188 (2018) 806–832

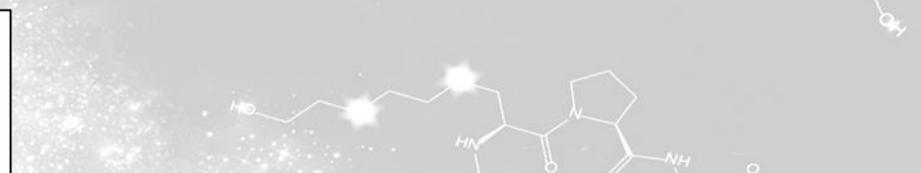
Contents lists available at ScienceDirect

Talanta

journal homepage: www.elsevier.com/locate/talanta

Advice on chemical weapons sample stability and storage provided by the Scientific Advisory Board of the Organisation for the Prohibition of Chemical Weapons to increase investigative capabilities worldwide

Christopher M. Timperley,¹ Jonathan E. Forman,² Mohammad Abdollahi,³ Abdullah Saeed Al-Amri,⁴ Isel Pascual Alonso,⁵ Augustin Baulig,⁶ Veronica Borrett,⁷ Flerida A. Cariño,⁸ Christophe Curty,⁹ David González Berrutti,¹⁰ Zrinka Kovarik,¹¹ Roberto Martínez-Álvarez,¹² Robert Mikulak,¹³ Nícia Maria Fusaro Mourão,¹⁴ Ramasami Ponnadurai,¹⁵ Slawomir Neffe,¹⁶ Syed K. Raza,¹⁷ Valentin Rubaylo,¹⁸ Koji Takeuchi,¹⁹ Cheng Tang,²⁰ Ferruccio Trifirò,²¹ Francois Mauritz van Straten,²² Paula S. Vanninen,²³ Volodymyr Zaitsev,²⁴ Farhat Waqar,²⁵ Mongia Said Zina,²⁶ Marc-Michael Blum,²⁷ Hugh Gregg,²⁸ Elena Fischer,²⁹ Siqing Sun,³⁰ Pei Yang³¹



Toxicology 415 (2019) 56–69

Contents lists available at ScienceDirect

Toxicology

journal homepage: www.elsevier.com/locate/toxicol



Advice on assistance and protection provided by the Scientific Advisory Board of the Organisation for the Prohibition of Chemical Weapons: Part 1. On medical care and treatment of injuries from nerve agents

Christopher M. Timperley,¹ Jonathan E. Forman,² Mohammad Abdollahi,³

Toxicology 413 (2019) 13–23

Contents lists available at ScienceDirect

Toxicology

journal homepage: www.elsevier.com/locate/toxicol



Advice on assistance and protection from the Scientific Advisory Board of the Organisation for the Prohibition of Chemical Weapons: Part 2. On preventing and treating health effects from acute, prolonged, and repeated nerve agent exposure, and the identification of medical countermeasures able to reduce or eliminate the longer term health effects of nerve agents

Christopher M. Timperley,¹ Mohammad Abdollahi,² Abdullah Saeed Al-Amri,³ Augustin Baulig,⁴ Djafer Benachour,⁵ Veronica Borrett,⁶ Flerida A. Cariño,⁷ Michael Geist,⁸ David Gonzalez,⁹ William Kane,¹⁰ Zrinka Kovarik,¹¹ Roberto Martínez-Álvarez,¹² Nícia Maria Fusaro Mourão,¹³ Slawomir Neffe,¹⁴ Syed K. Raza,¹⁵ Valentin Rubaylo,¹⁶ Alejandra Graciela Suárez,¹⁷ Koji Takeuchi,¹⁸ Cheng Tang,¹⁹ Ferruccio Trifirò,²⁰ Francois Mauritz van Straten,²¹ Paula S. Vanninen,²² Slavica Vučinić,²³ Volodymyr Zaitsev,²⁴ Muhammad Zafar-Uz-Zaman,²⁵ Mongia Said Zina,²⁶ Stian Hølen,²⁷ Jonathan E. Forman,²⁸ Wesam S. Alwan,²⁹ Vivek Suri³⁰



OPCW

Maintaining Visibility: Peer-Reviewed Publications

RSC Advances



Taylor & Francis
Taylor & Francis Group

AUSTRALIAN JOURNAL OF FORENSIC SCIENCES
<https://doi.org/10.1080/00450618.2018.1559356>

Check for updates

Investigative science and technology supporting the Organization for the Prohibition of Chemical Weapons (OPCW)

Veronica Borrett^a, Christopher M. Timperley^b, Jonathan E. Forman^c and Cheng Tang^d

Toxicology 415 (2019) 56–69

Full lists available at ScienceDirect

Toxicology

Page: www.elsevier.com/locate/toxicol



provided by the Scientific Advisory Board of the Organization for the Prohibition of Chemical Weapons: Part 1. Injuries from nerve agents

Forman^{d,*}, Mohammad Abdollahi^c,
Cheng Tang^d, Jonathan E. Forman^c, Christopher M. Timperley^b,
Veronica Borrett^a, Slawomir Neffe^e, Syed K. Raza^f, Valentin Rubaylo^g,
Alejandra Graciela Suárez^h, Koji Takeuchiⁱ, Ferruccio Trifirò^j,
Francois Mauritz van Straten^k, Paula S. Vanninen^l,
Slavica Vučinić^m, Volodymyr Zaitsev^{n,z}, Muhammad Zafar-Uz-Zaman^a,
Mongia Said Zina^b, Stian Holen^c, Jonathan E. Forman^{d,*}, Wesam S. Alwan^{e,f}, Vivek Suri^g

Toxicology 413 (2019) 13–23

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Current Opinion in
Green and Sustainable Chemistry



Available online at www.sciencedirect.com

ScienceDirect



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Is there a role for green and sustainable chemistry in chemical disarmament and nonproliferation?

Jonathan E. Forman¹ and Christopher M. Timperley²



journal homepage

Advice on chemical weapons sample collection for the Scientific Advisory Board of the Organization for the Prohibition of Chemical Weapons to increase investment in research and development

Christopher M. Timperley^{a,*}, Jonathan E. Forman^b, Abdullah Saeed Al-Amri^c, Ise Pascual Alonso^d, Florida A. Carriño^e, Christophe Curty^h, David Goebel^f, Roberto Martínez-Álvarez^k, Robert Mikulak^l, Nidhi Ramasami Ponnadurai^m, Slawomir Neffe^o, Syed K. Raza^p, Valentin Rubaylo^q, Koji Takeuchi^r, Cheng Tang^s, Ferruccio Trifirò^t, Francois Mauritz van Straten^u, Paula S. Vanninen^v, Volodymyr Zaitsev^w, Farhat Waqar^x, Mongia Said Zina^y, Marc-Michael Blum^z, Hugh Gregg^{aa}, Elena Fischer^{ab}, Siqing Sun^{ac}, Pei Yang^{ad}

William Kane¹, Zrinka Kovarik², Roberto Martínez-Álvarez³, Nidia María Fusaro Mourao⁴, Slawomir Neffe⁵, Syed K. Raza⁶, Valentin Rubaylo⁷, Alejandra Graciela Suárez⁸, Koji Takeuchi⁹, Cheng Tang¹⁰, Ferruccio Trifirò¹¹, Francois Mauritz van Straten¹², Paula S. Vanninen¹³, Slavica Vučinić¹⁴, Volodymyr Zaitsev^{15,z}, Muhammad Zafar-Uz-Zaman¹⁶, Mongia Said Zina¹⁷, Stian Holen¹⁸, Jonathan E. Forman^{19,*}, Wesam S. Alwan²⁰, Vivek Suri²¹



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A Special Issue of *Pure and Applied Chemistry* (Volume 90, Issue 10, October 2018)

OPCW | 1997-2017 | INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY | The National Academies of SCIENCES ENGINEERING AND MEDICINE | ACADEMIA BRASILEIRA DE CIENCIAS

03-05 | JULY - 2017
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OPCW

A Special Issue of *Pure and Applied Chemistry*

(Volume 90, Issue 10, October 2018)

Preface

Mark C. Cesa, Vitor Francisco Ferreira, Jonathan E. Forman*, Cheng Tang, Christopher M. Timperley, Camly Tran and Bernard West

OPCW-IUPAC Workshop on Innovative Technologies for Chemical Security

Conference paper

Jonathan E. Forman*, Christopher M. Timperley, Siqing Sun and Darcy van Eerten

Chemistry and diplomacy

<https://doi.org/10.1515/pac-2018-0902>

Conference paper

Jonathan E. Forman*, Christopher M. Timperley*, Pål Aas, Mohammad Abdollahi, Isel Pascual Alonso, Augustin Baulig, Renate Becker-Arnold, Veronica Borrett, Florida A. Cariño, Christophe Curty, David Gonzalez, Zrinka Kovarik, Roberto Martínez-Álvarez, Robert Mikulak, Evandro de Souza Nogueira, Ponnadurai Ramasami, Syed K. Raza, Ahmed E. M. Saeed, Koji Takeuchi, Cheng Tang, Ferruccio Trifirò, Francois Mauritz van Straten, Farhat Waqar, Volodymyr Zaitsev, Mongia Saïd Zina, Katarína Grolmusová, Guy Valente, Marlene Payva, Siqing Sun, Amy Yang and Darcy van Eerten

Innovative technologies for chemical security

<https://doi.org/10.1515/pac-2018-0908>



thenasem

academiabrasciencias

Conference paper

Christopher M. Timperley*, Jonathan E. Forman*, Mohammad Abdollahi, Abdullah Saeed Al-Amri, Isel Pascual Alonso, Augustin Baulig, Veronica Borrett, Florida A. Cariño, Christophe Curty, David Gonzalez, Zrinka Kovarik, Roberto Martínez-Álvarez, Robert Mikulak, Nícia Maria Fusaro Mourão, Ponnadurai Ramasami, Slawomir Neffe, Syed K. Raza, Valentin Rubaylo, Koji Takeuchi, Cheng Tang, Ferruccio Trifirò, Francois Mauritz van Straten, Paula S. Vanninen, Volodymyr Zaitsev, Farhat Waqar, Mongia Saïd Zina, Stian Holen and Hope A. Weinstein

Advice from the Scientific Advisory Board of the Organisation for the Prohibition of Chemical Weapons on isotopically labelled chemicals and stereoisomers in relation to the Chemical Weapons Convention

<https://doi.org/10.1515/pac-2018-0803>



OPCW

A Special Issue of *Pure and Applied Chemistry* (Volume 90, Issue 10, October 2018)

Preface

Mark C. Cesa, Vitor Francisco Ferreira, Jonathan E. Forman*, Cheng Tang,
Christopher M. Timperley, Camly Tran and Bernard West

OPCW-IUPAC Workshop

Technical

**Seven additional contributions
(six from workshop speakers)**

Conference paper

Jonathan
Isel Pas
Florida
Robert
Ponnac
Ferrucc
Mongia
Amy Ya

Inno

<https://doi.org/10.1039/C8PY00000A>

Conference paper

**12 SAB Related Publications
2018 – June 2019
Additional papers in preparation**



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Outline

- **The SAB and its current composition**
- **Updates on activities since the SAB 27**
- **Summary of the SAB 28**
- **SAB's road map to the 5th RevCon**





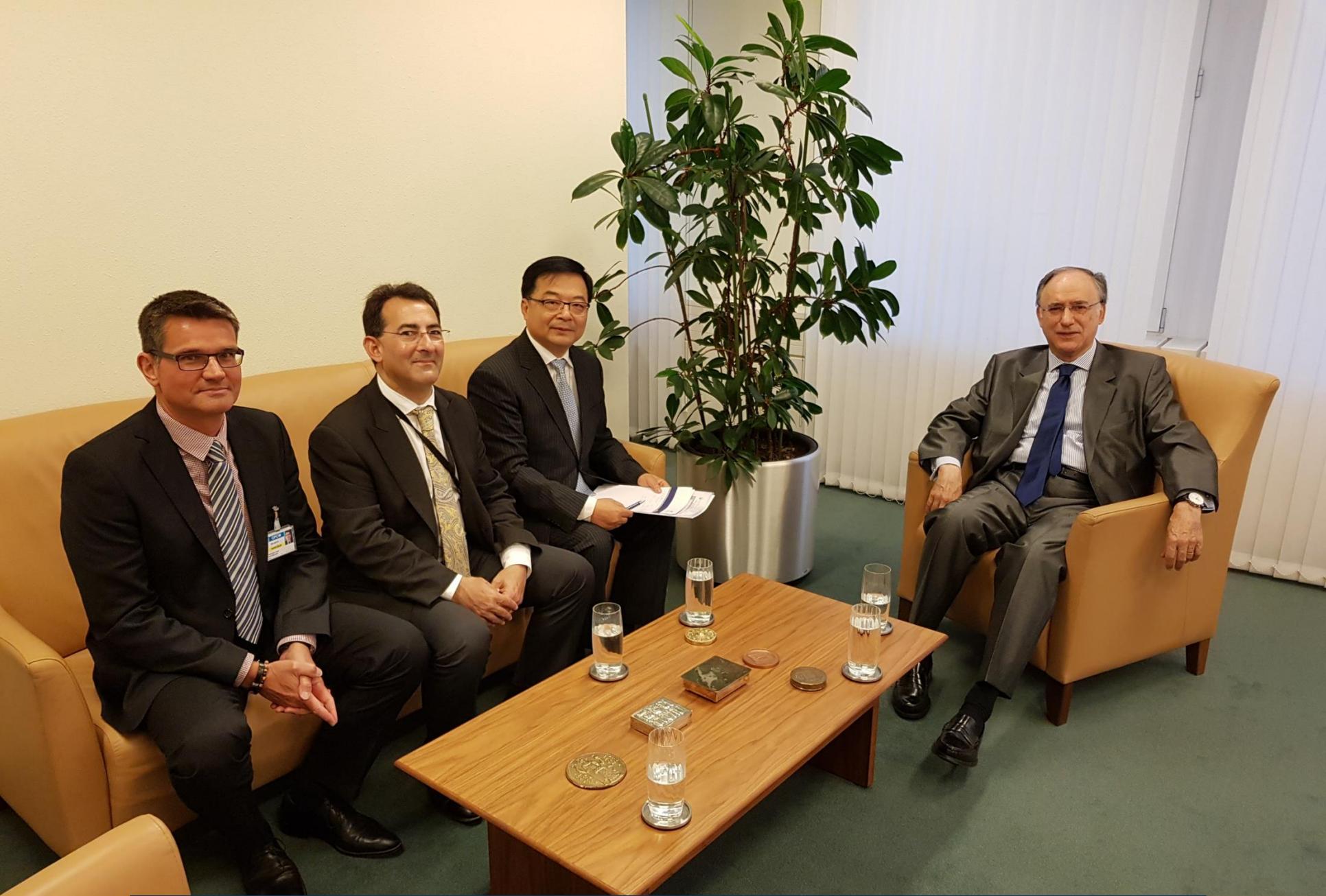
The DG opened the 28th session of the SAB

- Highlighted major developments at the OPCW:
 - ✓ on-going activities of the Secretariat in the Syrian Arab Republic;
 - ✓ the decision adopted last June by States Parties tasking the OPCW with identifying perpetrators of chemical weapons use in the Syrian Arab Republic
 - ✓ a second incident in the United Kingdom involving a new type of nerve agent;
 - ✓ States Parties submitting proposals to add new families of nerve agents to the Annex on Chemicals.
- Emphasised other significant challenges faced by the Convention.
 - ✓ particularly those posed by chemical terrorism;
 - ✓ the critical role of chemical security for preventing toxic substances from being diverted for malicious purposes.
 - ✓ informed the Board that the Secretariat is working to develop new tools and approaches in to assisting States Parties to identifying their own chemical security needs



The DG opened the 28th session of the SAB

- Asked the Board to continue its valuable considerations on where emerging tools and new scientific approaches fit into the dynamic and evolving operating environment of the Secretariat:
 - science and technology will only continue advancing at rapid pace, leaving us with open-ended questions on its implications for the Convention;
 - science advice for our decision makers must be practical and understandable, and it must address the needs of the OPCW;
 - the Board's views should serve to inspire and guide the OPCW in seizing enabling opportunities arising from technological change;
 - to support the project to upgrade the OPCW Laboratory into a "Centre for Chemistry and Technology", and especially to draw upon the findings from the TWG on investigative science and technology for formulating advice.



DG met with SAB Chair, Vice-Chair and Secretary

Agenda of the SAB 28

- ◆ Overview of development at the OPCW since the last session of the Scientific Advisory Board
- ◆ Outreach and engagement
- ◆ Advice on chemicals
- ◆ Investigative science
- ◆ Legacy chemical weapons
- ◆ Scientific and technological element of verification technologies, emerging technologies and new equipment
- ◆ Assistance and protection
- ◆ Digitalisation
- ◆ OPCW Laboratory
- ◆ Development in science and technology



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Investigative science and technology

- ❑ Identification and Investigation Team (IIT)
Briefing *(Mr Santiago Oñate, IIT)*
- ❑ Second and third meetings of the temporary working (TWG) group on investigative science and technology *(Dr Veronica Borrett)*
- ❑ Scenario based planning for non-routine missions *(Dr Michael Hoefler, Head of Capacity Building & Contingency Planning Cell)*
- ❑ Further considerations on investigative science and technology *(Dr Veronica Borrett)*



Investigative science and technology

- Identification and Investigation Team (IIT) Briefing (*Mr Santiago Oñate, IIT*)
- Second and third meetings of the temporary working (TWG) group on investigative science
- **Recommendations on forensic advisor and training forthcoming**

Contingency Planning Cell

- Further considerations on investigative science and technology (*Dr Veronica Borrett*)



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Overview of development at the OPCW since the last session of the Scientific Advisory Board



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Organisation for the Prohibition of Chemical Weapons

Updates After SAB-27
28th Session of the Scientific Advisory Board
10 - 14 June 2019



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Organisation for the Prohibition of Chemical Weapons

**The Fourth Review Conference
of the Chemical Weapons Convention**



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Organisation for the Prohibition of Chemical Weapons

**Chemical Information
Repository**

Zaven Hakopov
Senior Knowledge Management Officer
Technical Secretariat
11 June 2019



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Organisation for the Prohibition of Chemical Weapons

**Article VI
Verification Regime**

Larry Denyer, Barbara Hedler
Industry Verification Branch, Technical Secretariat
11 June 2019



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Outreach and engagement

OPCW SAB at the CONGRESS- CONVERGENCE!!!!

ORGANIZED BY:



Cuban Section of
Biochemistry and
Molecular Biology



Isel Pascual
Alonso, PhD



Maday Alonso
del Rivero, PhD



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33rd LATIN AMERICAN CONGRESS OF CHEMISTRY
(CLAQ) AND 10th CONGRESS OF CHEMICAL
SCIENCES, TECHNOLOGY AND INNOVATION



Isel Pascual Alonso (SAB) Center for
Protein Studies
University of Havana, Cuba
Secretary of Biochemistry and
Molecular Biology, Cuban Society of
Chemistry
isel@fbio.uh.cu



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Outreach and engagement

OPCW SAB at the CONGRESS- CONVERGENCE!!!!

ORGANIZED BY:



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Organisation for the Prohibition of Chemical Weapons

Chemistry and diplomacy :
OPCW Scientific Advisory Board

Dr Christopher M. Timperley (S)

The 33rd Latin-American Congress
Chemistry, Havana, 12 October 2014



Pseudo-catalytic nerve agents scavenging by
acetylcholinesterase assisted with aldoximes

Zrinka Kovarik

Institute for Medical Research and Occupational Health, Zagreb, Croatia

E-mail: zkovarik@imi.hr



OPCW

Advice on chemicals



OPCW

Organisation for the Prohibition of Chemical Weapons

The Scientific Advisory Board's Report on New Types of Nerve Agents and States Parties Proposals to Add Chemicals to Schedule 1

*28th Session of the Scientific Advisory Board
The Hague, 16 November 2018*

Cheng Tang

Chairperson, Scientific Advisory Board

Jonathan E. Forman, Ph.D.

Science Policy Adviser and Secretary to the Scientific Advisory Board

Science Policy Adviser and Secretary to the Scientific Advisory Board

Jonathan E. Forman, Ph.D.

Chairperson, Scientific Advisory Board

Cheng Tang

The Hague, 16 November 2018

28th Session of the Scientific Advisory Board



OPCW

Advice on chemicals



OPCW

Organisation for the Prohibition of Chemical Weapons

The Scientific Advisory Board New Types of Nerve Agents and States Parties Proposals to Schedule

28th Session of the Scientific Advisory Board
The Hague, 16 November 2018

Cheng Tan
Chairperson, Scientific Advisory Board
Jonathan E. Forman
Science Policy Adviser and Secretary to the Board

Scientific Advisory Board Briefing on the Director-General's Request for Advice on New Types of Nerve Agents



9 July, 12:00-13:00
Jeper Room



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Organisation for the Prohibition of Chemical Weapons



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Advice on chemicals



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Organisation for the Prohibition of Chemical Weapons

Ponnadurai Ramasami

Computational Chemistry Group
University of Mauritius
Mauritius



Department of Applied Chemistry,
University of Johannesburg

Department of Chemistry,
University of South Africa



Chairperson, Scientific Advisory Board
Jonathan E. Forman
Science Policy Adviser and Secretary to the Board

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Research articles

Theoretical study of the molecular aspect of the suspected novichok agent

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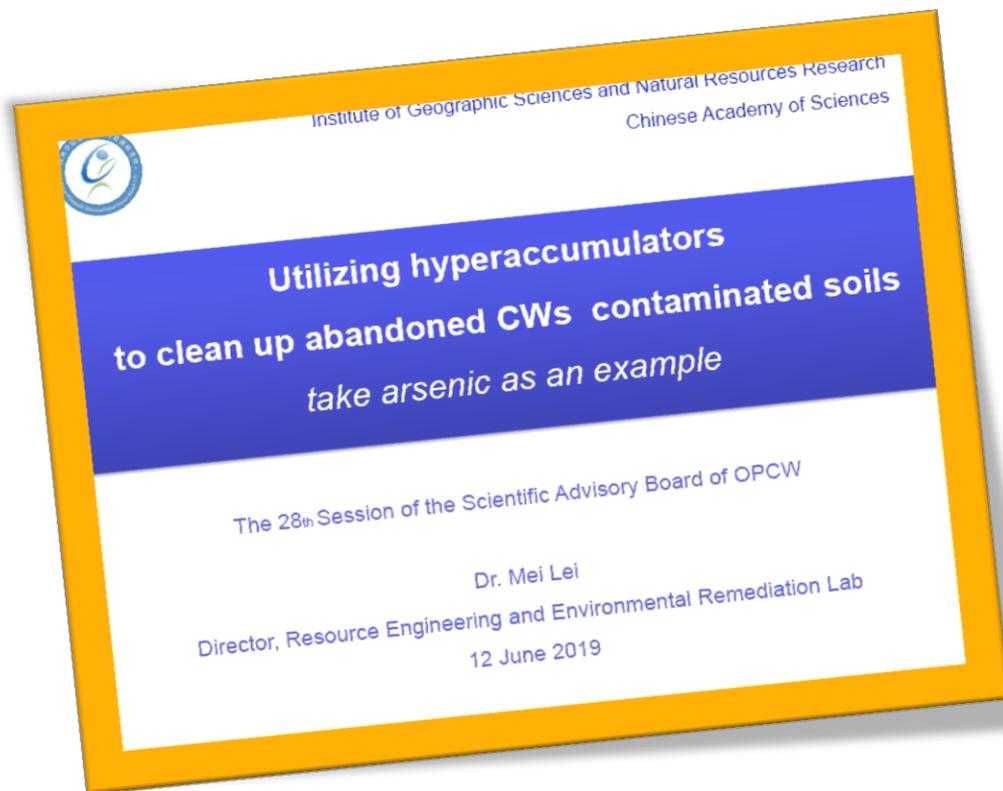
Processing math: 100%

Part B: Microhydration of Sulfur Mustard:
A computational study



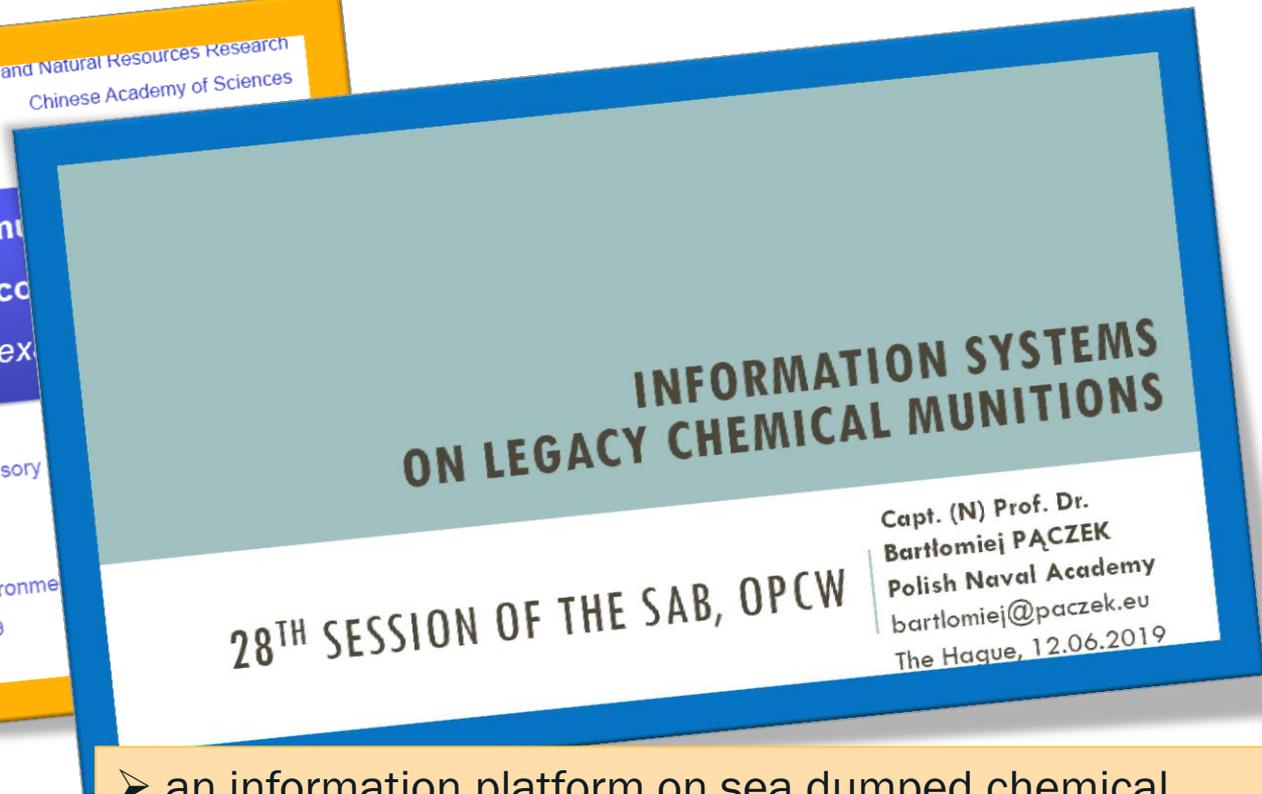
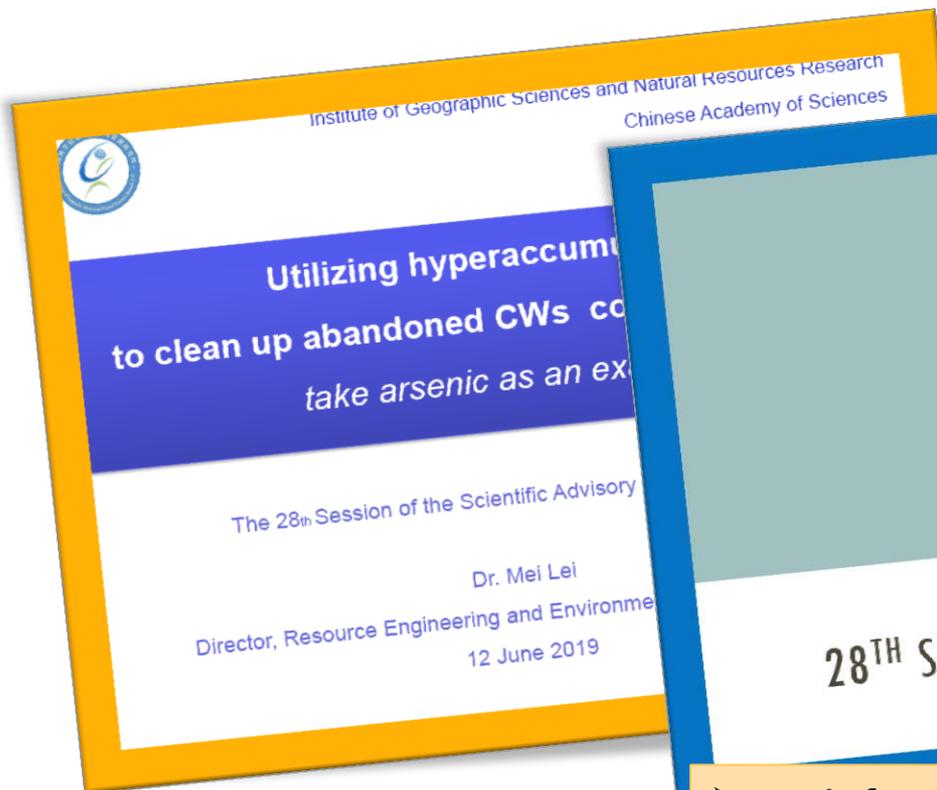
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Legacy chemical weapons



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Legacy chemical weapons



- an information platform on sea dumped chemical weapons that has been developed through international projects around the Baltic Sea.



OPCW

Scientific and technological element of verification technologies, emerging technologies and new equipment

AI for Chemical Verification

Tan Lee Han Eric
Chieu Hai Leong
Wong Jialiang Joshua
Wong Minn Xuan
Choo Xianjun Davin
Interns: Neo Neng Kai Nigel, Lim Jing
11 June 19

- use of AI to overcome the bottleneck of chemical structure elucidation in analytical chemistry



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Scientific and technological element of verification technologies, emerging technologies and new equipment

AI for Chemical Verification

Tan Lee Han Eric
Chieu Hai Leong
Wong Jialiang Joshua
Wong Minn Xuan
Choo Xianjun Davin
Interns: Neo Neng Kai Nigel
11 June 19

- use of AI to overcome bottleneck of chemical structure elucidation in analytical chemistry

Bundeswehr Institute of Pharmacology and Toxicology



Established and novel sulfur mustard adducts of human serum albumin for verification of poisoning

M.Sc. Markus Siegerl

- presented a compilation of diverse methods of the forensic analysis of plasma samples to identify SM-poisoning by peptide biomarkers.



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Scientific and technological element of verification technologies, emerging technologies and new equipment

AI for Chemical Verification

Tan Lee Han Eric
Chieu Hai Leong
Wong Jialiang Joshua
Wong Minn Xuan
Choo Xianjun Davir
Interns: Neo Neng Kai Nigel
11 June 19

- use of AI to overcome bottleneck of chemical structure elucidation analytical chemistry



Bundeswehr Institute of Pharmacology and Toxicology

Established adducts of verification

- presented diverse methods for analysis of identify SM peptide biomarkers.

Protein Adductomics: Methodologies for Untargeted Screening of Adducts to Serum Albumin and Haemoglobin in Human Blood Samples

Henrik Carlsson, Uppsala University Hospital/Uppsala University, Sweden
henrik.carlsson@akademiska.se
Presentation for the Scientific Advisory Board of the OPCW, June 12 2019

- ▣ briefed the Board on in vivo measurements of reaction products of electrophiles as adducts to the abundant proteins haemoglobin (Hb) and human serum albumin (HSA) in human blood samples



OPCW

Assistance and protection



- new US Federal guidance (“PRISM”) for responding to a mass casualty chemical incident;
- The PRISM is based on a comprehensive, six-year programme of laboratory studies, clinical research and field trials that underpin various aspects of the new response process



Assistance and protection

University of Hertfordshire **UH**



- new US Federal guidance (“PRISM”) for responding to a mass casualty chemical incident;
- The PRISM is based on a comprehensive, six-year programme of laboratory studies, clinical research and field trials that underpin various aspects of the new response process



OPCW

Organisation for the Prohibition of Chemical Weapons

International Support Network for Victims of Chemical Weapons

- the 16th CSP (2011) decision on the establishment of an international support network for victims of chemical weapons
- informed the board on the “International Symposium on Medical Treatment of Chemical Warfare Victims: Challenges and Hopes” which was organized by the OPCW in The Hague from 28-29 June 2018



OPCW

Assistance and protection



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Organisation for the Prohibition of Chemical Weapons

HOSPREP Decon Overview for SAB

Guy Valente, Programme Officer, APB
OPCW Technical Secretariat
28th Session of the Scientific Advisory Board
12 June 2019



of Chemical Weapons

Support Network for
Chemical Weapons

➤ new US
("PRISM")

mass casualty chemical incident;

➤ The PRISM is based on a comprehensive, six-year programme of laboratory studies, clinical research and field trials that underpin various aspects of the new response process

➤ HOSPREP - the chemical incident preparedness for hospitals project,

➤ a model of a decontamination shower system designed to be assembled from easily available materials and suitable to resource limited settings was demonstrated,

1) decision
t of an
network for
weapons
on the
posium on
f Chemical
allenges and
organized by
gue from 28-



OPCW

29 June 2018

Digitalisation

- Digital transformation powered by AI and related cybersecurity considerations (*Mr Maciej Surowiec, Microsoft*)
- Digitalisation in the chemical industry (*Dr Carsten Hoff, BASF Digitalization Team*)
- From EDNA to EDIS, the new Electronic Declarations platform (*Mr Alejandro Hernandez, Data Analytics, Reporting and Quality Control Section, OPCW Declarations Branch*)



OPCW Laboratory

- ❑ **OPCW ChemTech Centre Project** (Ms Sakiko Hayakawa, Senior planning officer from ODG, *Dr Marc-Michael Blum, Head OPCW Laboratory*)
- ❑ **OPCW Laboratory Updates** (*Dr Marc-Michael Blum, Head OPCW Laboratory*)



Outline

- **The SAB and its current composition**
- **Updates on activities since the SAB 27**
- **Summary of the SAB 28**
- **SAB's road map to the 5th RevCon**

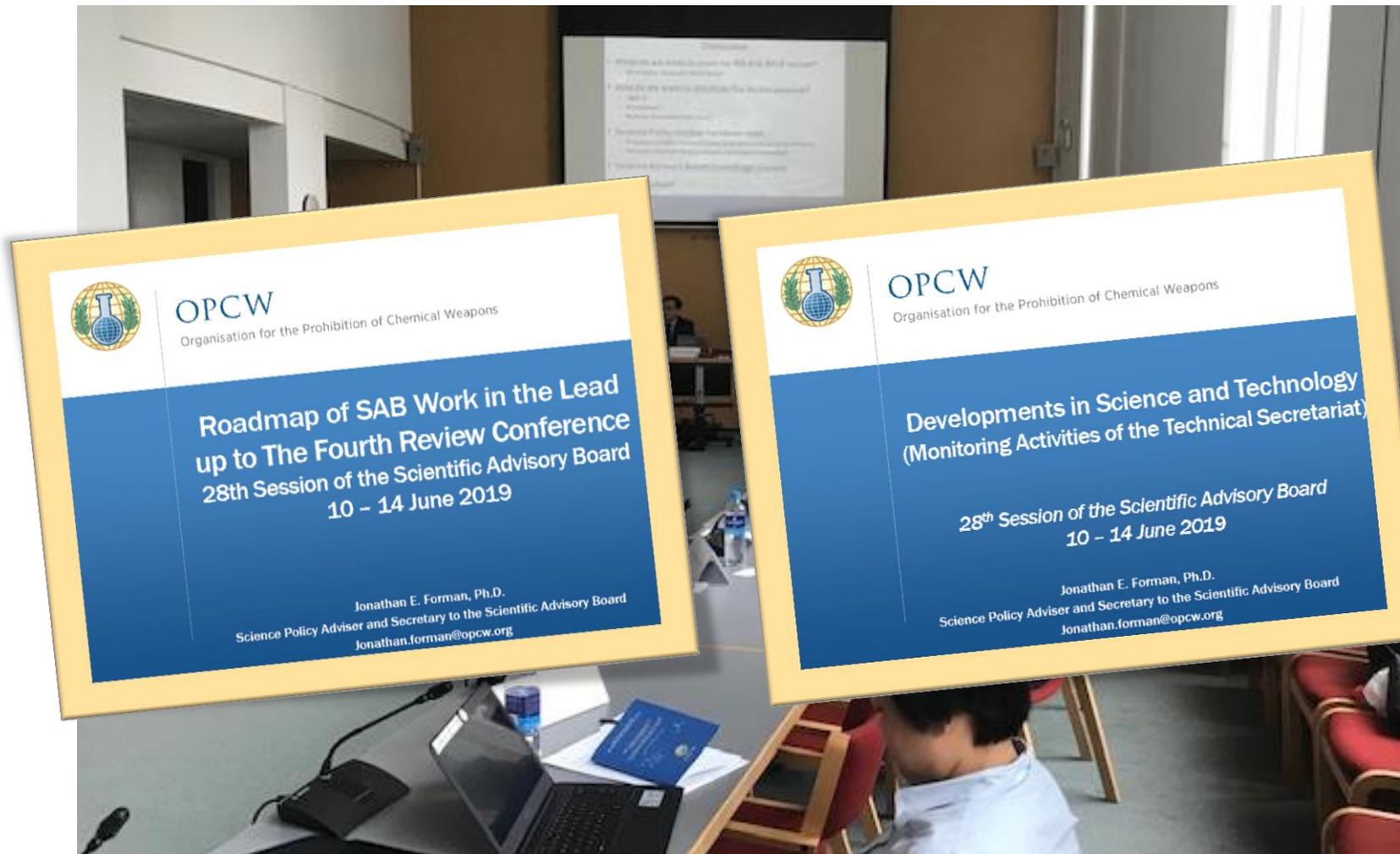


Informal Session on 10 June



OPCW

Informal Session on 10 June



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Future work of the SAB

- The Director-General's response to the recommendations to the Fourth Review Conference

(Dr Jonathan Forman)

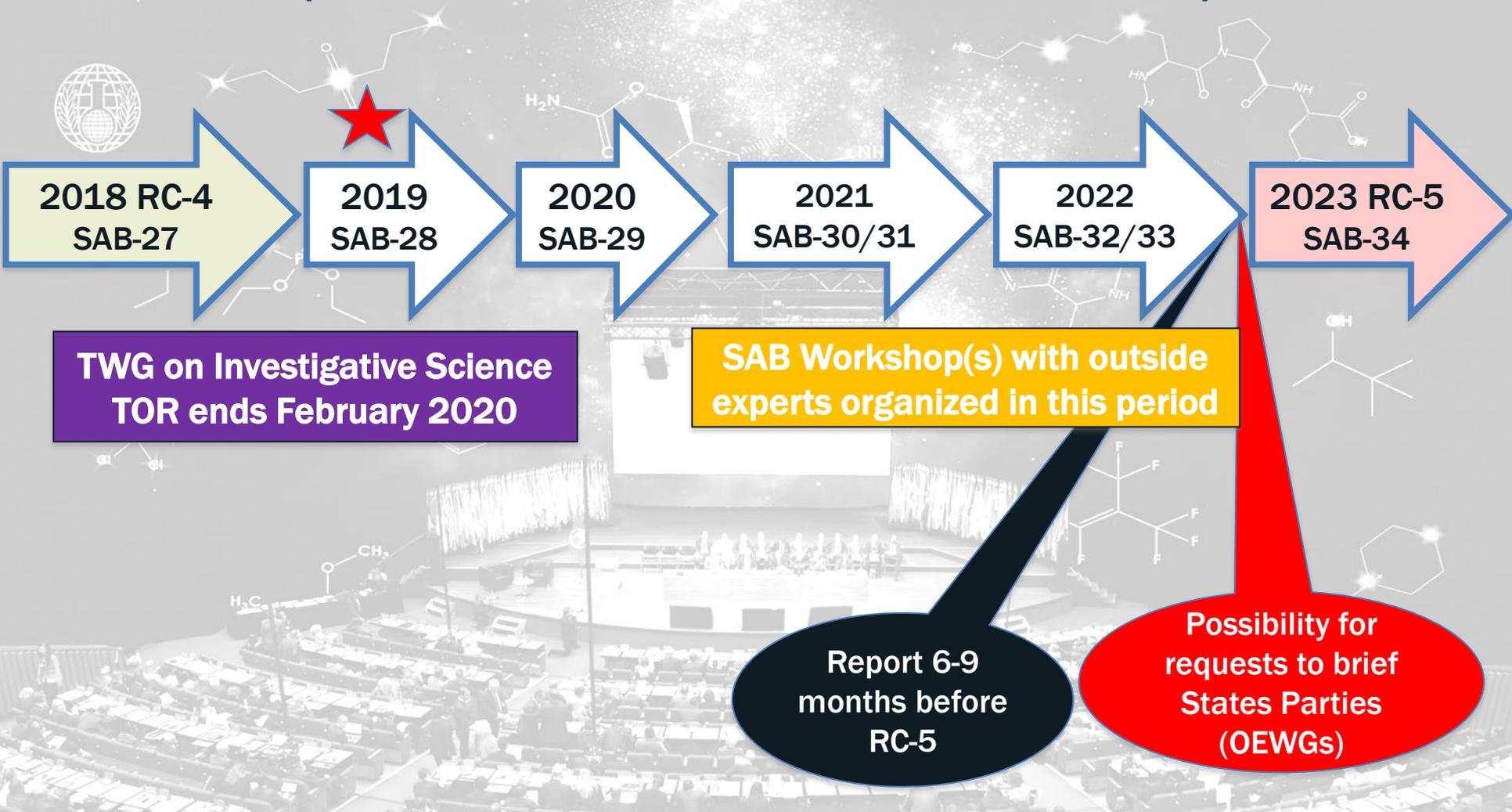
- SAB Recommendations and the Inspectorate and Verification Division

Dr Carolyn Browne, Director Verification;

Dr Evandoro de Sousa Nogueira, Director Inspectorate



Proposal for Road map towards RC-5 (SAB to further discuss and define)



Summary

- We are now living in an era of unprecedented scientific advancement and technological innovation with equally unprecedented access to, and diffusion of, scientific knowledge.
- As the dynamism of science can both improve and potentially undermine the ability to maintain an effective disarmament regime. The SAB must continue its efforts to review the development of science and technology and its impact to the implementation of the CWC and to enable the Director-General to render specialised advice to the States Parties



Final thoughts & Acknowledgment

- ❑ Support from all States Parties, including, attending our regular briefings and Science for Diplomats events
 - ❑ Australia, Saudi Arabia and the EU
- ❑ Special thanks to Dr. Jonathan Forman – Science Policy Officer and Secretary to the SAB and his Interns



Final thoughts & Acknowledgment

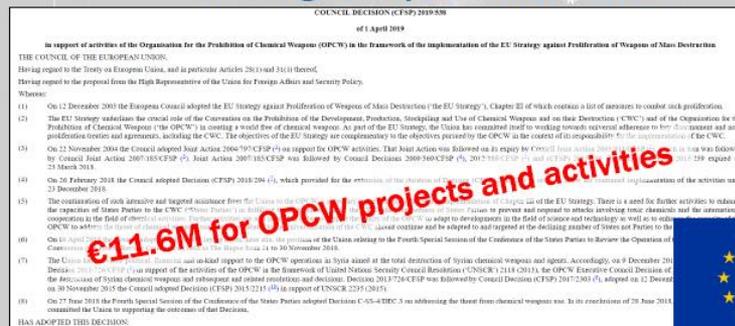
- Support from all States Parties, including, attending our regular briefings and Science for Diplomats events
- Australia, Saudi Arabia and the EU

Funding: Voluntary Contributions

- Australia donated ~€13,000 to SAB Trust Fund
- Saudi Arabia made available ~€6,000 for science communication activities



Funding: European Union Grant



- €300,000 for TWGs
 - Previous TWG grant covered TWGs and SAB workshops
- €250,000 for “Plant Biomarker Challenge”
 - Requires setting up a project review committee – to include SAB members



Final thoughts & Acknowledgment



Organisation for the Prohibition of Chemical Weapons



Scientific Advisory Board 2019

Final thoughts & Acknowledgment

apons



Which issues would you like to see the OEWG-FP address in its recommendations to the Fourth Review Conference in 2018? (2)

- Qualified organisation needs retain qualified people
 - TWG: “A number of the recommendations by the TWG are linked to the availability of adequate resources and expertise for their implementation. Additionally, and in view of tenure policy implemented in the organisation, sound knowledge management and transfer and retention of rare expertise are considered crucial in support of sustaining or enhancing verification capabilities.”
 - Is the current tenure policy is really a good policy for the organisation?
 - Do we need to address the tenure policy again?
 - SAB advises that the position of Science Policy Adviser is a vital bridge between science and technology and policy-making – a key ingredient for success

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禁止化学武器组织

Organisation for the Prohibition of Chemical Weapons

Organisation pour l'Interdiction des Armes Chimiques

Организация по запрещению химического оружия

Organización para la Prohibición de las Armas Químicas