

Scientific Advisory Board Briefing to the Conference of States Parties

Presented to the 24th Session of the CSP of the CWC
29 November 2019, The Hague , The Netherlands

Cheng Tang

SAB Chair

Christophe Curty

SAB Vice Chair



OPCW

Organisation for the Prohibition of Chemical Weapons



Scientific Advisory Board 2019



OPCW

Organisation for the Prohibition of Chemical Weapons



“

“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

Reports on the Developments of Science and Technology to the Review Conferences by the SAB

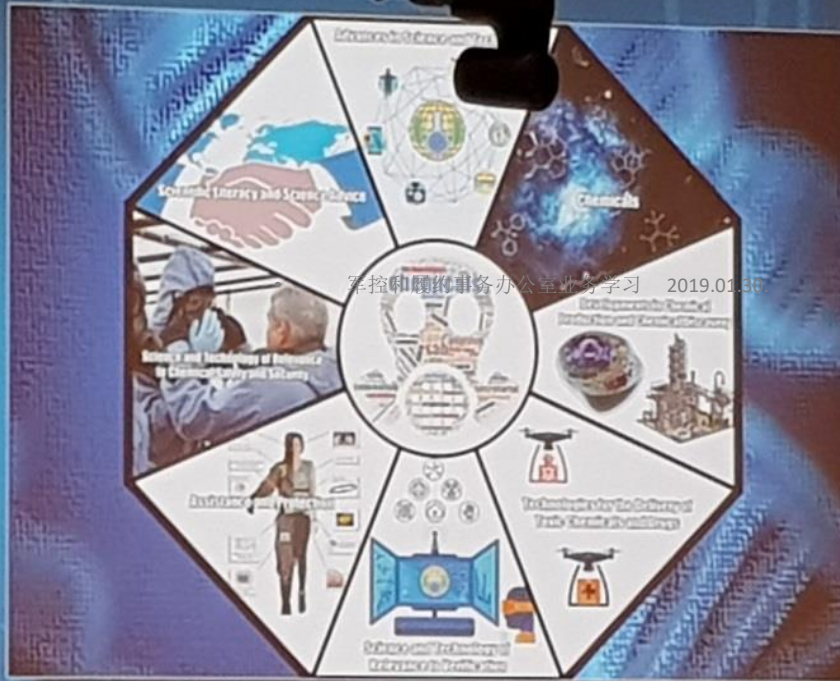
“To enable the Director-General, in the performance of his functions, to render specialized advice in areas of science and technology relevant to this Convention, to the Conference, the Executive Council or States Parties.”
- CWC Article VIII, Paragraph 21(h)

Scientific Advisory Board 2019

The Fourth Review Conference

(21 – 30 November 2018, World Forum, The Hague)

- 0 Floor
- 1 العربية
- 2 中文
- 3 English
- 4 Français
- 5 Русский
- 6 Español



Conference of the States Parties
to the Chemical Weapons Convention



The Fourth Review Conference

(21 – 30 November 2018, World Forum, The Hague)



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.





The 28th Session of the SAB
10-14 June 2019



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 using sciences could usefully be developed and Chemical Weapons Convention-based

Question 4:

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

Question 7:

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

Question 10:

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

management of data including compilation,



methodologies (whether the provenancing of collected in an



methodologies (whether ensure the integrity of



provide advice on Technical methodologies, procedures, management for investigative



5th meeting of the TWG on investigative science and technology
18-20 November 2019, Helsinki Finland



@opcw
@opcw_st



/opcwonline



/opcwonline



/company/opcw



/photos/opcw



/opcw



ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS

Working Together For a World Free of Chemical Weapons

Temporary Working Group on Investigative Science and Technology

Establishment of a “TWG on Investigative Science and Technology” originally proposed



OPCW Scientific Advisory Board Workshop

Chemical Forensics: Capabilities across the field and the potential applications in CWC Implementation
Helsinki Finland, 20-22 June 2016



ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS

Working Together For a World Free of Chemical Weapons

Temporary Working Group on Investigative Science and Technology



2nd Meeting of the TWG on Investigative Science and Technology
14-16 Nov 2019, The Hague



ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS

Working Together For a World Free of Chemical Weapons

Temporary Working Group on Investigative Science and Technology

Areas of focus

Forensic methods
and capabilities

Data collection and
management

Sampling, detection
and analysis

Integrity of scene and
evidence collection

Provenance

Other considerations

- **More than 100 technical briefings received**
- **Over 145 experts from 36 States Parties attended**



ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS

Working Together For a World Free of Chemical Weapons

Temporary Working Group on Investigative Science and Technology

Areas of focus

Forensic
and o

Sampling
and

Pro

ion and
ment

Scene and
Collection

erations

Science For Diplomats at CSP-24 Presents:

The Return of the Chemical Mystery

The inspectorate joins us to take you on a chemistry mission guided with advice from the Temporary Working Group on Investigative Science and Technology

Wednesday 27 November 2019
13:15-14:45
Europe Room, World Forum
Light Lunch available at 13:00

OPCW

- More than 100 technical briefings received
- Over 145 experts from 36 States Parties attended



Science for Diplomats





Science for Diplomats



Science is fun!



Periodic Table of States Parties to the Chemical Weapons Convention

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

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

1 SE Sweden 17/06/1993																	2 NO Norway 07/04/1994																																																									
3 AU Australia 06/05/1994	4 ES España 03/08/1994																	5 BG Bulgaria 10/08/1994	6 DE Deutschland 12/08/1994	7 MX México 25/08/1994	8 GR Grecia 22/12/1994	9 RO Romania 15/02/1995	10 FR Francia 02/10/1995																																																			
11 HR Hrvatska 23/05/1995	12 MC Monaco 01/06/1995																	13 DZ Algérie 14/08/1995	14 AT Österreich 17/08/1995	15 PL Polska 23/08/1995	16 JP Japan 15/09/1995	17 CA Canada 26/09/1995	18 AR Argentina 02/10/1995																																																			
19 NA Namibia 24/11/1995	20 IT Italia 08/12/1995	21 CI Côte d'Ivoire 18/12/1995	22 MA Maroc 28/12/1995	23 BR Brasil 13/03/1996	24 GB Grande-Bretagne 13/05/1996	25 MD Moldova 08/07/1996	26 PT Portugal 10/09/1996	27 HU Hongrie 31/10/1996	28 PH Philippines 11/12/1996	29 BE Belgique 27/01/1997	30 LU Luxembourg 27/01/1997	31 TN Tunisie 15/04/1997	32 TG Togo 23/04/1997	33 CN Chine 25/04/1997	34 US États-Unis 25/04/1997	35 ZW Zimbabwe 25/04/1997	36 IS Islande 26/04/1997																																																									
37 ML Malawi 28/04/1997	38 MT Malte 28/04/1997	39 FJ Fidji 20/01/1993	40 MU Maurice 09/02/1993	41 AL Albanie 11/05/1994	42 CK Cook Islands 15/02/1994	43 LK Sri Lanka 10/08/1994	44 PY Paraguay 01/12/1994	45 TJ Tadjikistan 11/01/1995	46 MN Mongolie 17/01/1995	47 FI Finlande 07/02/1995	48 CH Suisse 10/03/1995	49 NL Pays-Bas 30/06/1995	50 DK Danemark 11/07/1995	51 PE Pérou 20/07/1995	52 EC Équateur 06/09/1995	53 ZA Afrique du Sud 13/09/1995	54 SK Slovaquie 17/10/1995																																																									
55 SV El Salvador 30/10/1995	56 GE Géorgie 27/11/1995	57 CZ République tchèque 06/03/1996	58 PA Panama 07/10/1998	59 ET Éthiopie 13/05/1996	60 CR Costa Rica 31/05/1996	61 IE Irlande 24/06/1996	62 BY Biélorussie 11/07/1996	63 CL Chili 12/07/1996	64 NZ Nouvelle-Zélande 15/07/1996	65 IN Inde 03/09/1996	66 CM Cameroun 16/09/1996	67 NE Niger 09/04/1997	68 BD Bangladesh 25/04/1997	69 GQ Guinée équatoriale 25/04/1997	70 KR Corée du Sud 28/04/1997	71 SC Seychelles 07/04/1999	72 UY Uruguay 06/10/1994	73 KE Kenya 24/07/1994	74 SA Arabie saoudite 09/08/1998	75 OM Oman 08/02/1995	76 BH Bahreïn 28/04/1997	77 AM Arménie 27/01/1997	78 LC Saint-Christophe-et-Niévès 09/04/1997	79 LV Lettonie 23/07/1996	80 LA Laos 25/02/1997	81 SZ Swaziland 20/11/1996	82 MV Maldives 31/05/1994	83 TM Turkménistan 25/02/1997	84 LS Lesotho 07/12/1994	85 UZ Ouzbékistan 23/07/1996	86 BA Bosnie-Herzégovine 25/02/1997																																											
87 SR Suriname 28/04/1997	88 CU Cuba 29/04/1997	89 TR Turquie 22/05/1997	90 SG Singapour 21/05/1997	91 KW Koweït 26/05/1997	92 GN Guinée 09/06/1997	93 SI Slovénie 11/06/1997	94 MK Macédoine 20/06/1997	95 TT Trinité-et-Tobago 24/06/1997	96 BF Burkina Faso 08/07/1997	97 GH Ghana 09/07/1997	98 BN Brunei 28/07/1997	99 QA Qatar 03/08/1997	100 GY Guyane 12/09/1997	101 PK Pakistan 28/10/1997	102 JO Jordanie 29/10/1997	103 IR Iran 05/11/1997	104 RU Russie 05/11/1997	105 NP Népal 18/11/1997	106 VE Venezuela 03/12/1997	107 MR Mauritanie 09/02/1998	108 LT Lituanie 15/04/1998	109 BJ Bénin 14/05/1998	110 GM Gambie 19/05/1998	111 MW Malawi 11/06/1998	112 TZ Tanzanie 25/06/1998	113 SN Sénégal 20/07/1998	114 BO Bolivie 14/08/1998	115 CY Chypre 28/08/1998	116 BW Botswana 31/08/1998	117 BI Burundi 04/09/1998	118 VN Vietnam 30/09/1998																																											
119 PA Panama 07/10/1998	120 UA Ukraine 14/10/1998	121 ID Indonésie 12/11/1998	122 VA Vatican 12/05/1999	123 NG Nigeria 20/05/1999	124 SD Soudan 24/05/1999	125 EE Estonie 26/05/1999	126 FM Micronésie 21/06/1999	127 NI Nicaragua 05/11/1999	128 LI Liechtenstein 24/11/1999	129 SM Saint-Marin 10/12/1999	130 ER Érythrée 24/02/2000	131 AZ Azerbaïdjan 29/02/2000	132 KZ Kazakhstan 23/03/2000	133 CO Colombie 05/04/2000	134 MY Malaisie 20/04/2000	135 RS Serbie 20/04/2000	136 MZ Mozambique 15/08/2000	137 KI Kiribati 07/09/2000	138 GA Gabon 08/09/2000	139 JM Jamaïque 08/09/2000	140 YE Yémen 02/10/2000	141 AE Émirats arabes unis 28/11/2000	142 ZM Zambie 09/02/2001	143 DM Dominique 12/02/2001	144 NR Nauru 12/11/2001	145 UG Ouganda 30/11/2001	146 VC Saint-Christophe-et-Niévès 18/09/2002	147 WS Samoa 27/09/2002	148 TH Thaïlande 10/12/2002	149 PW Palévoine 05/02/2003	150 GT Guatemala 12/02/2003	151 AD Andorre 27/03/2003	152 TL Timor-Leste 07/05/2003	153 TO Tonga 29/05/2003	154 AF Afghanistan 24/09/2003	155 ST Sao Tomé-et-Principe 09/09/2003	156 KG Kirghizistan 29/09/2003	157 CV Cap-Vert 10/10/2003	158 BZ Belize 01/12/2003	159 LY Libye 06/01/2004	160 TV Tonga 19/01/2004	161 TD Chad 13/02/2004	162 RW Rwanda 31/03/2004	163 MH Marshall 19/05/2004	164 KN Saint-Kitts-et-Nevis 21/05/2004	165 SB Salomon 23/09/2004	166 SL Sierra Leone 30/09/2004	167 MG Madagascar 20/10/2004	168 NU Niue 21/04/2005	169 GD Grenade 03/06/2005	170 KH Cambodge 19/07/2005	171 BT Bhoutan 18/08/2005	172 HN Honduras 30/08/2005	173 AG Antigua-et-Barbude 08/09/2005	174 VU Vanuatu 16/09/2005	175 CD Congo (Kinshasa) 09/02/2001	176 DJ Djibouti 21/01/2006	177 HT Haïti 22/02/2006	178 LR Libéria 23/02/2006	179 ME Monténégro 15/04/1998	180 KM Comores 18/08/2006	181 CF Congo (Brazzaville) 21/01/2006	182 BB Barbade 07/03/2007	183 CG Congo (Brazzaville) 04/12/2007	184 GW Guinée-Bissau 20/05/2008	185 LB Liban 20/11/2008	186 IQ Irak 13/01/2009	187 DO Dominique 27/03/2009	188 BS Bahamas 21/04/2009	189 SO Somalie 29/05/2013	190 SY Syrie 14/09/2013	191 MM Myanmar 06/07/2015	192 AO Angola 16/09/2015	193 PS État de Palestine 17/05/2018

1

H

Hydrogen

dd/mm/yyyy

Country Element

Order of Entry into Force

Country Symbol

Date of Deposit

Western Europe and Other States (WEOG)


Eastern Europe

Africa

Latin America and the Caribbean (GRULAC)

Asia

LEGEND



OPCW

United Nations
Educational, Scientific and
Cultural Organisation

International Year
of the Periodic Table
of Chemical Elements

2019

1913-2019

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

Order of Entry into Force

Country Element

Country Symbol

Date of Deposit

LEGEND

- Western Europe and Other States (WEOG)
- Eastern Europe
- Africa
- Latin America and the Caribbean (GRULAC)
- Asia



Periodic Table of States Parties to the Chemical Weapons Convention

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

¹ SE
Swedenium
17/06/1993

² NO
Norwegium
07/04/1994

Financial and/or catering support to the SAB and the Science for Diplomats initiative



全學網 www.quanxue.com

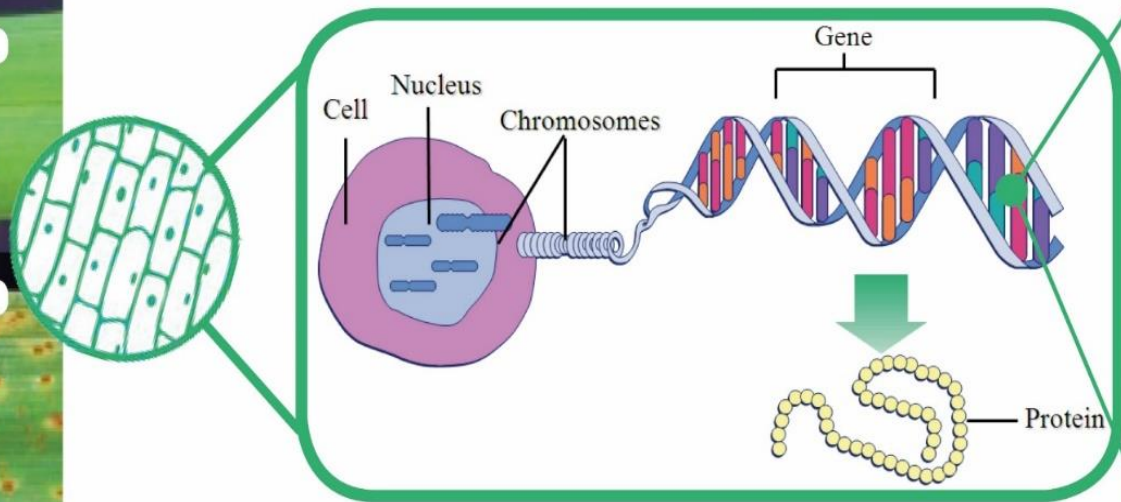
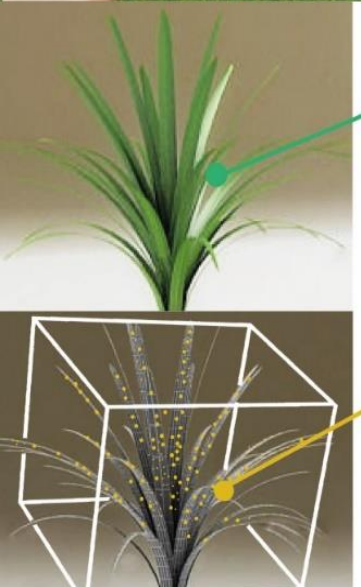
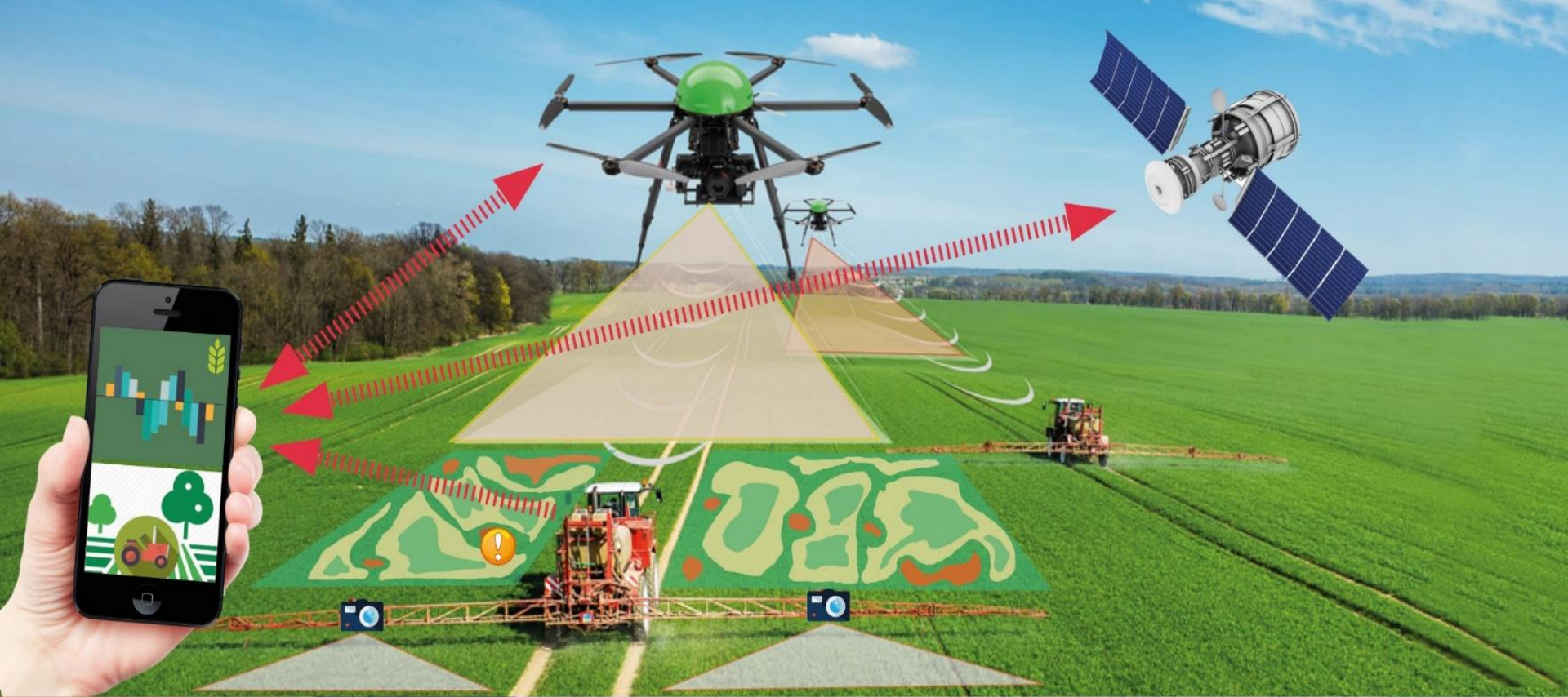


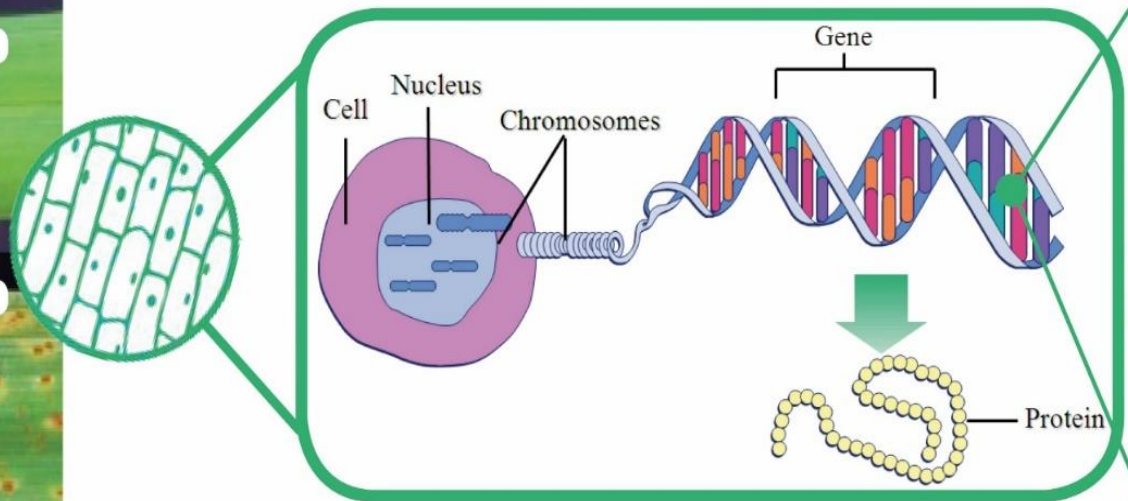
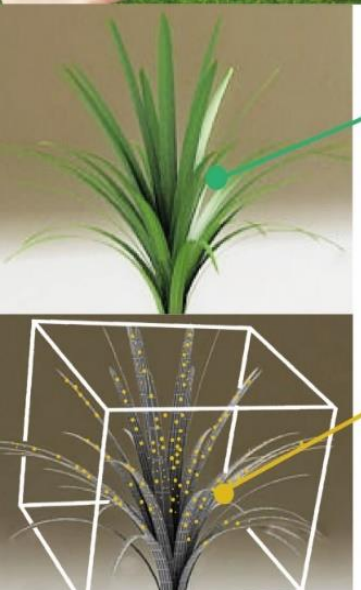
IUPAC




INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY







Science supports policy deliberations



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...

The poster features a central sun-like glow with radiating blue lines and various molecular structures, including a complex polycyclic amine.



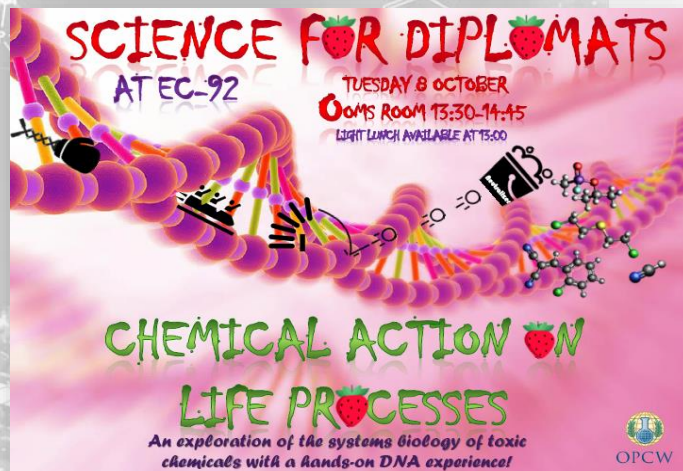
Science For Diplomats
Starring the OPCW Laboratory

Illuminating Chemical Reactivity

Tuesday 9 July 2019
13:30 - 14:45
Ooms Room
(Light lunch available at 13:00)

...an event guaranteed to brighten up your day!

The poster has a black background with a vibrant rainbow bar chart and a chemical structure of a complex amine.



SCIENCE FOR DIPLOMATS
AT EC-92

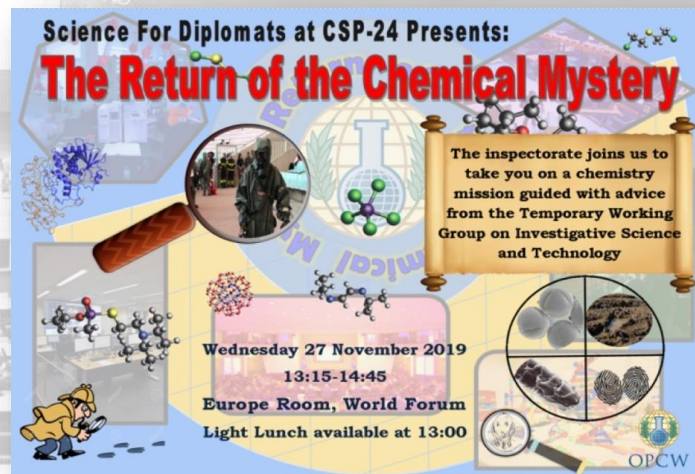
TUESDAY 8 OCTOBER
Ooms Room 13:30-14:45
LIGHT LUNCH AVAILABLE AT 13:00

CHEMICAL ACTION ON LIFE PROCESSES

An exploration of the systems biology of toxic chemicals with a hands-on DNA experience!

OPCW

The poster features a pink background with a DNA double helix, chemical structures, and a small illustration of a person in a lab coat.



Science For Diplomats at CSP-24 Presents:

The Return of the Chemical Mystery

The inspectorate joins us to take you on a chemistry mission guided with advice from the Temporary Working Group on Investigative Science and Technology

Wednesday 27 November 2019
13:15-14:45
Europe Room, World Forum
Light Lunch available at 13:00

OPCW

The poster has a blue background with a magnifying glass over a chemical structure, a cartoon detective, and a grid of chemical images.



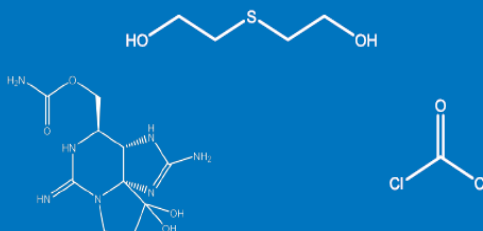
OPCW

Science supports policy deliberations

ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS

THE "SCIENCE FOR DIPLOMATS" ANNEX ON CHEMICALS

A user friendly and scientifically annotated version of the Chemical Weapons Convention Annex on Chemicals



OPCW

LIFE PROCESSES

An exploration of the systems biology of chemicals with a hands-on DNA exper

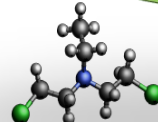
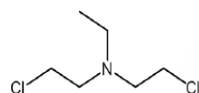


OPCW

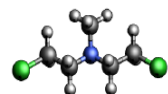
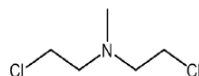


(6) Nitrogen mustards:

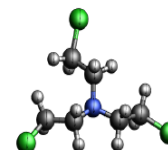
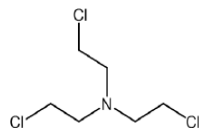
HN1: Bis(2-chloroethyl)ethylamine
(IUPAC Name: 2-chloro-N-(2-chloroethyl)-N-ethylethanamine)
Scientific Advisory Board recommendation: including corresponding protonated salts.



HN2: Bis(2-chloroethyl)methylamine
(IUPAC Name: 2-chloro-N-(2-chloroethyl)-N-methylethanamine)
Scientific Advisory Board recommendation: including corresponding protonated salts.



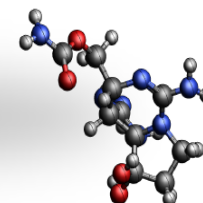
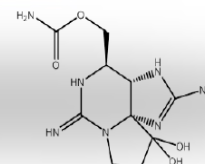
HN3: Tris(2-chloroethyl)amine
(IUPAC Name: 2-chloro-N,N-bis(2-chloroethyl)ethanamine)
Scientific Advisory Board recommendation: including corresponding protonated salts.



(35523-89-8)

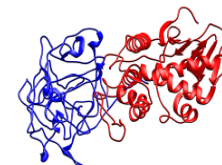
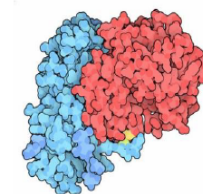
2,2,6,6-tetrahydro-1H-

including corresponding protonated salts.



(8) Ricin

(9009-86-3)



Ricin is a protein composed of toxic (A-chain) and cell-targeting (B-chain) subunits, illustrated in red (A-chain) and blue (B-chain) in the structure on the left. The right structure is an interactive ribbon model of the ricin molecule.⁸

⁸ E. Rutenber, B. J. Kozma, S. Ernst, E. J. Collins, M. P. Resdy, J. D. Roberts; Crystallographic refinement of ricin to 2.5 Angstroms; *Protein*; 1991, 10, 240-250. DOI: 10.1002/pro.340100308. Protein Data Bank structure 2AA1. Available at: <https://www.rcsb.org/structure/2AA1>

Engagement with the BWC Communities



BIOLOGICAL WEAPONS CONVENTION



Meeting of Experts 2

Review of Developments in the Field of Science
and Technology Related to the Convention

31 July, 2 August 2019
Room XX, Palais des Nations



UNITED NATIONS
GENEVA



Engagement with the BWC Communities




موجبات
لاهيا الأخلاقية

تطبيق قواعد ممارسة
الكيمياء لدعم
اتفاقية الأسلحة الكيميائية

منظمة حظر الأسلحة الكيميائية
التي تديرها الأمم المتحدة

[@OPCW](#)
[@OPCW_ST](#)
[/OPCWONLINE](#)
[/OPCWONLINE](#)
[/OPCWCOMPANY](#)
[/OPCW](#)



Applying the norms of
the practice of chemistry to
support the
Chemical Weapons Convention

THE HAGUE
ETHICAL
GUIDELINES

ORGANISATION FOR THE
PROHIBITION OF CHEMICAL WEAPONS

[@OPCW](#)
[@OPCW_ST](#)
[/OPCWONLINE](#)
[/OPCWONLINE](#)
[/OPCWCOMPANY](#)
[/OPCW](#)



运用化学实践
规范以支持
化学武器公约
的实施

海牙伦
理准则

禁止化学武器组织
携手共同打造一个无化学武器世界

[@OPCW](#)
[@OPCW_ST](#)
[/OPCWONLINE](#)
[/OPCWONLINE](#)
[/OPCWCOMPANY](#)
[/OPCW](#)



Aplicar las normas
de la práctica
de la química para apoyar
la Convención sobre
las Armas Químicas

DIRECTRICES
ÉTICAS DE LA
HAYA

ORGANIZACIÓN PARA LA
PROHIBICIÓN DE LAS ARMAS QUÍMICAS

[@OPCW](#)
[@OPCW_ST](#)
[/OPCWONLINE](#)
[/OPCWONLINE](#)
[/OPCWCOMPANY](#)
[/OPCW](#)



Применяя нормы
практики химии
поддержки
Конвенции о
химическом оружии

Гаагские
этические
принципы

ОПХВ
ОПХВ-СТ
ОПХВОНЛАЙН
ОПХВОНЛАЙН
ОПХВКОМПАНИ
ОПХВ



Appliquer les normes
de la pratique de la
chimie afin de soutenir
la Convention sur les
armes chimiques

LES PRINCIPES
DIRECTEURS
ÉTHIQUES DE LA
HAYE

ORGANISATION POUR
L'INTERDICTION DES ARMES CHIMIQUES

[@OPCW](#)
[@OPCW_ST](#)
[/OPCWONLINE](#)
[/OPCWONLINE](#)
[/OPCWCOMPANY](#)
[/OPCW](#)



2019

Biological Weapons
Convention
Meeting of Experts

29 JULY - 8 AUGUST
PALAIS DES NATIONS, GENEVA



BIOLOGICAL WEAPONS CONVENTION



Meeting of Experts 2

Review of Developments in the Field of Science
and Technology Related to the Convention

31 July, 2 August 2019
Room XX, Palais des Nations



UNITED NATIONS
GENEVA



The Scientific Advisory Board 2014-2019



**Thank all SAB members past and present for their
dedication and contributions!**

The Scientific Advisory Board 2014-2019



SAB 2014



SAB 2017



SAB 2016



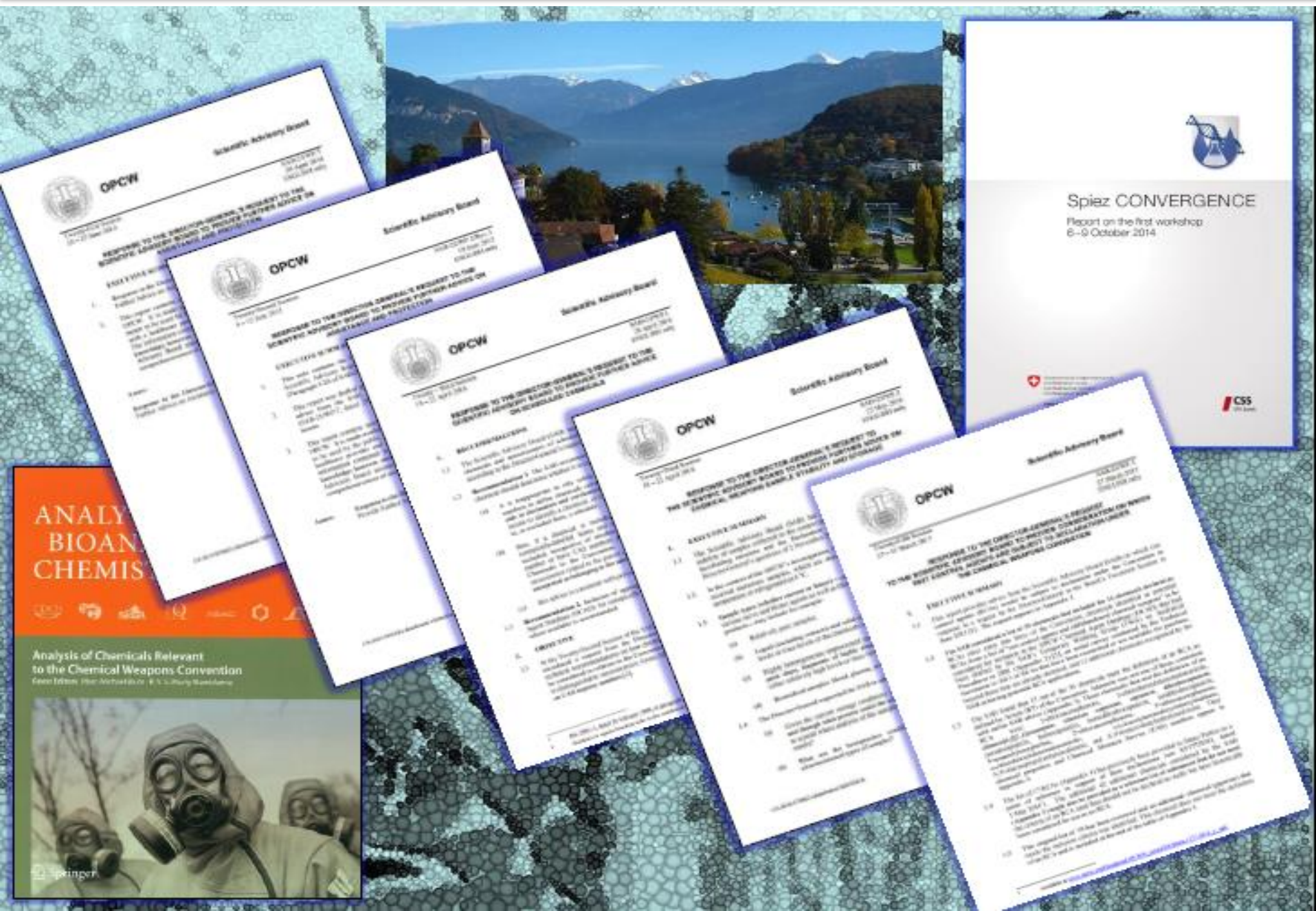
SAB 2019

**Thank all SAB members past and present for their
dedication and contributions!**

SAB'S visibility significantly raised



SAB'S visibility significantly raised



SAB'S visibility significantly raised



OPCW | 1997-2017



INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY



The National Academies of SCIENCES ENGINEERING MEDICINE



ACADEMIA BRASILEIRA DE CIÊNCIAS

03-05 | JULY - 2017
RIO DE JANEIRO - BRAZIL

INTERNATIONAL WORKSHOP ON INNOVATIVE TECHNOLOGIES FOR CHEMICAL SECURITY

Science for Peace

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



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

RSC Advances



REVIEW

View Article Online
View Journal | View Issue



Cite this: *RSC Adv.*, 2018, 8, 41731

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,^{a,*} Jonathan E. Forman,^{b,*} Pal Aas,^c Mohammad Abdollahi,^d Djafer Benachour,^e Abdullah Saeed Al-Amri,^f Augustin Baulig,^g Renate Becker-Arnold,^h Veronica Borrett,ⁱ Flerida A. Cariño,^k Christophe Curty,^{l,m} David Gonzalez,ⁿ Michael Geist,^o William Kane,^p Zrinka Kovarik,^q Roberto Martinez-Álvarez,^r P. Robert Mikulak,^s Nícia Maria Fusaro Mourão,^t Slawomir Neffe,^u Evandro De Souza Nogueira,^v Ponnadurai Ramasami,^w Syed K. Raza,^x Valentin Rubaylo,^y Ahmed E. M. Saeed,^z Koji Takeuchi,^{aa} Cheng Tang,^{ab} Ferruccio Trifiro,^{ac} Francois Mauritz van Straten,^{ad} Alejandra G. Suárez,^{ae} Farhat Waqar,^{af} Paula S. Vanninen,^{ag} Mohammad Zafar-Uz-Zaman,^{ah} Slavica Vučinić,^{ai} Volodymyr Zaitsev,^{aj} Mongia Said Zina,^{ak} Stian Holen^{al} and Fauzia Nurul Izzati^{al}

Toxicology 415 (2019) 56–69



ELSEVIER

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^{a,*}, Jonathan E. Forman^{b,*}, Mohammad Abdollahi^c, Abdullah Saeed Al-Amri^d, Augustin Baulig^e, Renate Becker-Arnold^f, Veronica Borrett^g, Flerida A. Cariño^h, Christophe Curtyⁱ, David Gonzalez^j, Michael Geist^k, William Kane^l, Zrinka Kovarik^m, Roberto Martinez-Álvarezⁿ, P. Robert Mikulak^o, Nícia Maria Fusaro Mourão^p, Slawomir Neffe^q, Evandro De Souza Nogueira^r, Ponnadurai Ramasami^s, Syed K. Raza^t, Valentin Rubaylo^u, Ahmed E. M. Saeed^v, Koji Takeuchi^w, Cheng Tang^x, Ferruccio Trifiro^y, Francois Mauritz van Straten^z, Alejandra G. Suárez^{aa}, Farhat Waqar^{ab}, Paula S. Vanninen^{ac}, Mohammad Zafar-Uz-Zaman^{ad}, Slavica Vučinić^{ae}, Volodymyr Zaitsev^{af}, Mongia Said Zina^{ag}, Stian Holen^{ah} and Fauzia Nurul Izzati^{ai}



Toxicology 413 (2019) 13–23



ELSEVIER

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



Talanta 188 (2018) 808–832



ELSEVIER

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^{a,*}, Jonathan E. Forman^{ab,*}, Mohammad Abdollahi^b, Abdullah Saeed Al-Amri^c, Isel Pascual Alonso^d, Augustin Baulig^e, Veronica Borrett^f, Flerida A. Cariño^g, Christophe Curty^h, David Gonzalez Berruttiⁱ, Zrinka Kovarik^j, Roberto Martinez-Álvarez^k, Robert Mikulak^l, Nícia Maria Fusaro Mourão^m, Ramasami Ponnaduraiⁿ, Slawomir Neffe^o, Syed K. Raza^p, Valentin Rubaylo^q, Koji Takeuchi^r, Cheng Tang^s, Ferruccio Trifiro^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}





Scientific Advisory Board 2019



To Jonathan Forman

In grateful recognition of your great support to the work of the Scientific Advisory Board of the OPCW
From

Members of the SAB (2019): Cheng Tang (Chair), Christophe Curty (Vice-Chair), Veronica Borrett (Chair of TWG), Pål Aas, Isel Pascual Alonso, Khaldoun Bachari, Renate Becker-Arnold, Chua Hoe Chee, Vladimir Dimitrov, Mostafa Ghanei, Wilford Z. Jwalshik, Zrinka Kovarik, Andrea Leisewitz, Robert Mikulak, Daan Noort, Ponnadurai Ramasami, Günter Povoden, Syed K Raza, Syeda Sultana Razia, Valentin Rubaylo, Ahmed E. M. Saeed, Yasuo Seto, Maciej Sliwakowski, Farhat Waqar

Interns of the OGP (2019): Giovanna Pontes, Peter Brud, Lucas Benderitter

@ SAB 28, 14 June 2019, The Hague.



**Working together for a world
free of chemical weapons**

Thank you !

前途是光明的 道路是曲折的

— The Future is Bright, The Road is Tortuous —