



Toxicology Group Newsletter 2023

Contents

- Welcome from the Editor
- [Committee / Keep in Touch](#)
- [Forthcoming Meetings](#)
- [Meeting Reports](#)
- [Faces of Toxicology](#)
- [Toxicology Topics in Brief](#)
- [Latest publications from IARC](#)

Dear Readers,

Welcome to the Toxicology Group's Newsletter for 2023.

In this issue I should like to highlight the inaugural RSC Toxicology Early Career Award. Nominations are now open and close **16 October 2023** so please consider nominating the rising stars of toxicology that you interact with. The [nomination form](#) can be found on the website.

Thanks to Mike Quint (E H Sciences Ltd) for his long-standing service on the committee; he has now stood down but will see through our Environmental Toxic Tort meeting (scheduled now for 20 November), for which he was instrumental in developing the programme. Our call for committee members was very successful (thanks to everyone who nominated themselves and to everyone who participated in the voting). We have welcomed four new members to the committee and they are already actively participating.

Enjoy the reading, be well, and feel free to get in touch. Please also complete the survey about a fourth "plastics" meeting – see p4.

Kate Jones
Chair, RSC Toxicology Group

Committee members

Chair: Kate Jones (HSE)

Treasurer: John MacLachlan (retired)

Secretary: Chris Waine (bibra)

Members: Lindsay Bramwell (University of Northumbria), Sarah Bull (TARA Consulting), David Hart (retired), Mark Hosford (International Platinum Group Metals Association), Ehi Idahosa-Taylor (Exponent), Anais Kahve (Exponent), Trudy Knight (Birmingham University), George Kowalczyk (Consultant), Margaret McGuinness (Guernsey Water), David O'Loughlin (MRC), Shirley Price (University of Surrey), Martin Rose (Consultant), Paul Russell (Unilever), Ovnair Sepai (UKHSA), Andrew Smith (MRC-Leicester).

Keep in Touch

We post an eAlert every month for the group so please make sure that you are signed up to receive emails from RSC – check your account settings.

Our web pages will continue to host forms and more static content.

For more immediate updates we use **LinkedIn** (<https://www.linkedin.com/groups/12014086>) and **Twitter** ([@RSCToxGroup](https://twitter.com/RSCToxGroup)).

Please do join in with the conversation!



Forthcoming Meetings

Please take note of the following meetings and sign up early to avoid disappointment. Bursaries are available to any RSC Toxicology member for attendance at our meetings, subject to the usual [conditions](#).

2023 Current Issues in Contaminated Land Risk Assessment

12 December 2023, London and online

An annual meeting to update those in the field on new and emerging topics in contaminated land risk assessment. Booking opens in September.

Confirmed topics include:

- Environment Agency and NCLOG updates
- Measuring background concentrations of PFAS in English soils
- Microplastics and potential risks to human health
- Microplastics - ITRC guidance
- Updates from the NAPL and CSM/statistics subgroups
- and much more.....

Early Careers poster competition - this year we are running an early careers poster competition, for which the prize is £250. This is an opportunity to showcase your work in advancing UK (or international) risk assessment best practice or unusual nonstandard projects. The competition is open to all early career professionals with less than seven years' experience in the field of risk assessment. Posters should be prepared in A1 portrait format for the conference and submitted in advance (in pdf format) to info@sobra.org.uk by **1 November 2023**.

Toxic Tort in the UK: Current Perspectives and Recent Cases

20 November 2023, London, United Kingdom.

A one-day event of discussion and case studies to bring together practicing lawyers and legal academics, with toxicologists and scientists, to increase understanding between the two and to appreciate each other's strengths and limitations.

Environmental toxic tort claims are personal injury lawsuits in which claimants allege adverse health impacts from environmental exposure to toxic substances, due to wrongful acts, or omissions, of defendants. These claims fall within the remit of civil law and are therefore distinct from the enforcement of environmental regulations by government bodies, such as the Environment Agency. Remedies for successful claimants typically involve financial compensation, which may include punitive damages. The Hollywood movies Dark Waters and Erin Brockovich depict such lawsuits.

The goal of this conference is to explore current perspectives on environmental toxic tort claims and review recent cases as well as forging links between the communities of toxicology and law. Observations regarding the relevance of this area of law to environmental protection will also be discussed, while technical challenges, especially those relating to causation, will be highlighted.

The conference will end with a networking reception.

Plastics IV?

We are thinking about the scope and interest for a fourth meeting in our plastics series. We have already covered a number of topics over the years and would like to seek views on whether to arrange a new meeting and, if so, what topics would be relevant. If this is an area of interest to you, please do provide your views via this [survey](#).

You can check out the content of the previous meetings from the links below.

[Plastics, from Cradle to Grave and Resurrection I](#) – 2019

Challenges for waste and recycling.

[Plastics, from Cradle to Grave and Resurrection II](#) – 2021

Focus on microplastics and packaging.

[Plastics, from Cradle to Grave – and Resurrection III](#) – 2022

Microplastics in the environment and migration from recycled food contact materials.

2023 RSC Toxicology Early Career Award seminar

As noted in the editorial, nominations are now open for this award for early career scientists working in toxicology.

The award includes a contribution of up to £750 towards expenses for attendance at a relevant scientific conference plus £250 to spend as the awardee chooses. They will also get to co-ordinate a seminar where they can present their own work and select some speakers to support them in their theme. The plan is for the seminar to be held in **early 2024**.

Nominations are open until 16 October 2023. Proposals require a nominator, a seconder and a citation of ~500 words. Complete the [form](#) and send to the RSC Secretary, Chris Waine, at chris.waine@bibratoxadvice.co.uk.

2023 Toxicology Group Early Career Award

- Call for [nominations](#) now open
- Deadline – Monday 16th October 2023
- Prize and own, curated, presentation seminar
- [Nomination form](#) available from the [website](#)

Follow us on social media for news of upcoming events

 [Toxicology Group - Royal Society of Chemistry](#)

 [@RSCToxGroup](#)

 [YouTube](#) [Faces of Toxicology](#)

 RSC INTEREST GROUP
TOXICOLOGY



Meeting Reports

BTS Annual Congress Session 2023

As has become traditional the RSC Toxicology group organised a themed session at the BTS Congress; this year's theme was confident physiologically-based kinetic (PBK) modelling in next generation risk assessment (NGRA).

NGRA is human-relevant, exposure-led, hypothesis-driven and designed to prevent harm^a. PBK modelling is a critical tool in NGRA (as well as in traditional risk assessment) for estimating human exposure. Without good quality PBK models describing internal exposure, safety decision making using new approaches is severely limited. Traditionally, PBK model outputs have been validated by comparison against in vivo data, and confidence in the predictive capacity of a PBK model is based partly on the concordance between model predictions and in vivo kinetic data not used to parameterize the model^b. In NGRA, the challenge for the PBK modelling community is to parameterize models partially or entirely based on data from in vitro and in silico studies, with limited or no availability of in vivo kinetic data to parametrize/calibrate and to compare predictions. Therefore, this symposium/session focuses on critical considerations in the application of PBK, e.g. on parametrisation, interpretation of in vitro data, as well as identifying and quantifying the uncertainties in the PBK models, and how to increase the confidence in using PBK modelling to help make safety decisions in the absence of human pharmacokinetic data, which is especially important for regulatory acceptance.

Session presentations included:

Alicia Paini (ESQ Labs) - Systematic review of PBK models to facilitate a read across approach.

Joseph Leedale (Syngenta) - The potential of PBK modelling to inform agrochemical safety and reduce toxicity testing.

Tessa van Tongeren (Wageningen University, Netherlands) - Next Generation Risk Assessment of the Anti-Androgen Flutamide Including the Contribution of Its Active Metabolite Hydroxyflutamide.

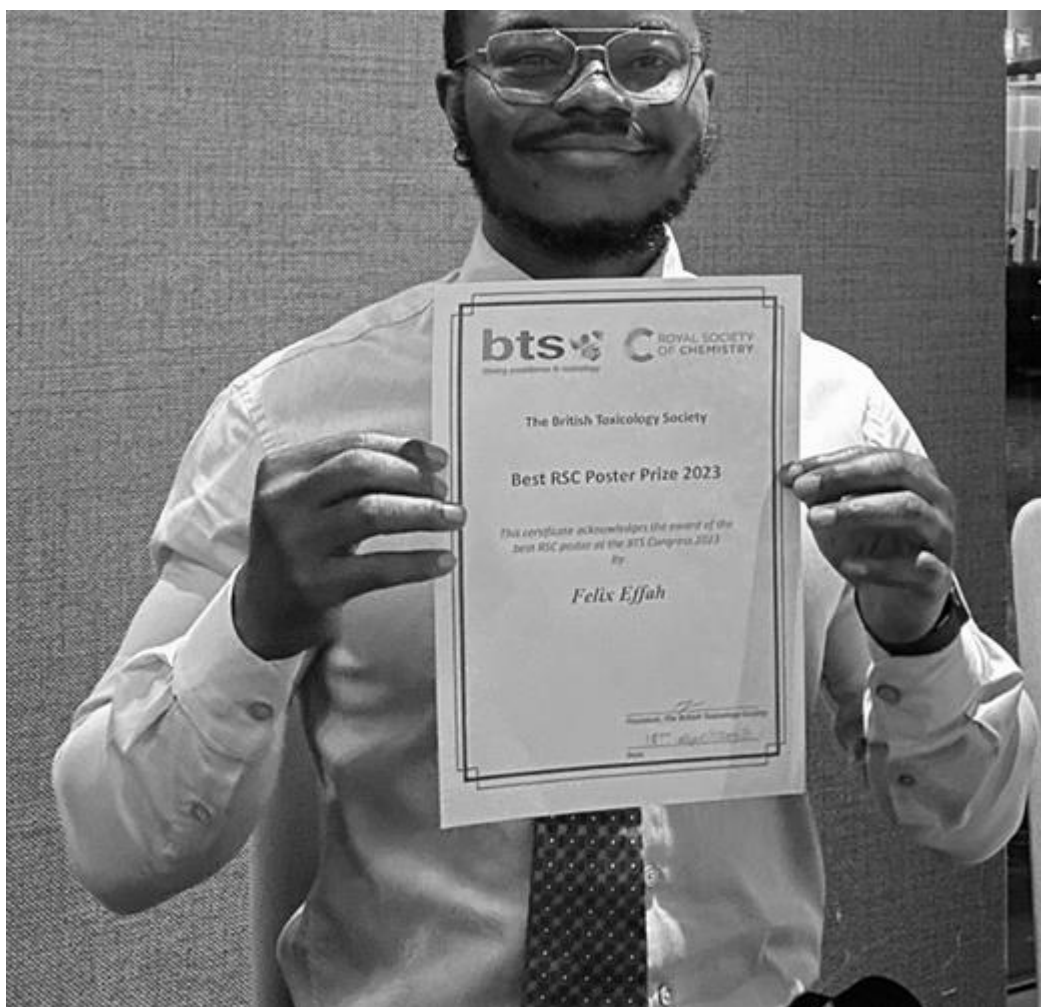
RSC-sponsored poster prize

In addition to hosting this session, we also sponsored a poster prize and Felix Effah (UKHSA) was the deserving winner with his poster on "High-Throughput In Vitro

^a Dent, M., et al., Computational Toxicology, 2018. 7: p. 20-26.

^b<https://www.oecd.org/chemicalsafety/risk-assessment/guidance-document-on-the-characterisation-validation-and-reporting-of-physiologically-based-kinetic-models-for-regulatory-purposes.pdf>

Toxicological Assessment of E-Cigarette Flavours in Human Bronchial Epithelial Cells and the Role of TRPA1 in cinnamon flavour-induced Toxicity.”



A few words from the prize winner:

“I am thrilled to share that I recently attended the British Toxicology Society Congress for the first time, and it was an incredible experience. The congress provided an amazing opportunity to learn about the latest developments and cutting-edge research in the field of toxicology, as well as connect with experts from various areas of the discipline.

I was particularly honoured to have been selected as the winner of the Royal Society of Chemistry Prize for Best Poster on the toxicity of flavours in e-liquids. Winning this prestigious award was an incredible achievement, and it is a testament to the hard work and dedication that I have put into my research.

One of the highlights of the congress for me was being able to attend the presentations and discussions of experts in the field, and to learn from their extensive experience and expertise. I also appreciated the chance to connect with other attendees and share ideas and insights, as well as build new professional relationships.

Attending this congress has been an invaluable experience for me, and I am already looking forward to next year's event. I am excited to continue to learn, grow, and

contribute to the field of toxicology, and I am grateful for the opportunity to be part of such an incredible community of experts and researchers.

I would like to extend my sincere thanks to the organizers, the Royal Society of Chemistry, and all the attendees for making this such an unforgettable experience. I look forward to seeing you all again next year!”

Felix Effah (UKHSA)



BTS poster.pdf

UK PARC Science Day

3-4 July 2023, London, United Kingdom



The Partnership for the Assessment of Risks from Chemicals (PARC) is a €400 million public initiative aiming to develop next-generation chemical risk assessment to protect health and the environment. It is a 7-year project which was launched in Paris on 11 May 2022.

It involves 200 partners in 28 countries and at the EU level, national agencies and research organisations working in the areas of the environment or public health, the European Chemicals Agency (ECHA), the European Food Safety Authority (EFSA), and the European Environment Agency (EEA).

The main objectives are:

- Develop the scientific skills needed to address current and future challenges in chemical safety
- Provide new data, methods and innovative tools to those responsible for assessing and managing the risks of chemical exposure
- Strengthen the networks which bring together actors specialised in the different scientific fields contributing to risk assessment

The Science Day aimed to highlight UK research and policy developments across relevant PARC Work Packages. The objectives of the day were to:

- Increase awareness of the many PARC activities taking place in the UK

- Increase networking between PARC partners
- Host discussions on how PARC contributes to UK ambitions on the future of chemicals management

As well as presentations, there were a good selection of posters, many of relevance to toxicology. RSC Toxicology awarded a poster prize, judged by the attendees; Xiaojing Li from University of Birmingham won the popular vote for her poster on “Precision Environmental Health: Leveraging AI for Prioritizing Hazardous Components in Unintentional Chemical Mixtures”.

Xiaojing had this to say about the event: “I found this event to be both stimulating and enlightening. The talks provided valuable insights into the role and mission of the PARC UK national hub, and how its objectives align with the UK government's 25-year plan to enhance the environment. I gained a deeper understanding of the potential role that new approach methodologies (NAMs) could play in formulating guidelines for emerging chemical pollutants, such as PFAS, nanomaterials, and unintentional chemical mixtures. The discussions highlighted the knowledge gaps that require scientific input and how these insights can contribute to policy reform. The dialogue between scientists and regulators was particularly intriguing, as it offered a glimpse into the exchange of knowledge and understanding, all aimed at improving UK regulation in the post-EU-exit era. I received a substantial amount of positive feedback on my research work, which has enhanced my understanding of how my Precision Environmental Health framework could be adapted to meet regulatory needs - providing a holistic approach for early warning of health hazards from unintentional chemical mixtures and identifying hazardous chemical components for prioritization in future risk assessment, monitoring, and regulation.”

Congratulations to Xiaojing, her poster can be found below.



PARC poster.pdf

SoBRA December 2022 Conference



The annual SoBRA Christmas conference was held on December 08, 2022. The hybrid event was well attended in-person and online. The morning session featured speakers from the Environment Agency, UK Health Security Agency and consultancies. Rebeka Norbury provided an update From the National Contaminated Land Officers Group (NCLOG) an organisation that was formed in 2019 to act as the representative body for contaminated land officers on a national, government and industry level.

The second part the morning was dominated by updates on PFAS provided by Jo Wilding and Sarah Bull from Cambridge Environmental Assessments and Camilla Alexander-White, on behalf of the Toxicology group. Camilla Alexander-White provided the RSC's policy position on PFAS including an overview of some of the challenges associated with the analyses, risk assessment and management of these group of compounds. Given the widespread use of PFAS, the RSC advocate a risk-based approach and maintain that a multisector approach will be required to create pragmatic and proportionate solutions. Camilla explained, the RSC will be part of a Defra-led subgroup within the UK Chemical Stakeholder Forum to develop work in this area in 2023 and as part of their exploration of realistic policy options for the UK. The RSC also held a PFAS in water workshop in Nov 2022, and following this engagement and evidence gathering, a policy position on PFAS in drinking water will be developed. In many areas, decisions have to be made in the absence of good evidence, and the case of PFAS pollution is one such area. The RSC also held a workshop in July 2022 on 'When the science is uncertain, what is the role of risk-based approaches and precautionary control in chemicals policy?'. Both the RSC policy position on 'Risk-based regulation for PFAS' and the 'PFAS in drinking water' policy position and the workshop report on risk and precautionary control, can be found on the RSC website at: [A chemicals strategy for a sustainable chemicals revolution](#).

The afternoon sessions included a comprehensive overview of vapour intrusion investigations and odour assessments. Chair Simon Cole outlined the Society's activities for the year including discussions on potential future groups.

Ehi Idahosa-Taylor (RSC Toxicology committee)

View [programme](#).

Exposure Science 2022

“I had the pleasure of presenting a poster at Exposure Science Conference for the first time. The friendly environment at this conference made me feel confident presenting my work. The poster presentation introduction was an excellent idea for getting to know what topics were being presented in the poster section. Also, I gained valuable insight into current research through the oral presentation. Furthermore, the conference was well organized, which was beyond my expectations.

I am most pleased that the committee appreciated my work. I am looking forward to attending the Exposure Science Conference in the near future.”

Halah Aljofi, University of Manchester

Full poster embedded below:



ExpSci poster.pdf

[Dioxin 2022: 42nd International Symposium on Halogenated Persistent Organic Pollutants](#)

New Orleans, Louisiana, USA

Dioxin 2020 in Nantes (France) was cancelled due to Covid, and Dioxin 2021 in Xi An (China) was largely an on-line event, so this was a welcome return to a face-to-face event. Although the ‘Dioxin’ name remains for the conference, the breadth of topics is in fact much wider and a large focus at this meeting was on the Per- and Poly- fluorinated Alky Substances (PFASs), and on chlorinated paraffins (CPs). There were about 350 delegates which is roughly half of the usual numbers, probably due to the fact that the conference was moved from the end of August to October in order to avoid hurricane season, thus reducing the number of academics who could attend, the low number of Asian visitors due to visa problems and strict travel restrictions in place due to Covid, and still a general reluctance to travel by some people at the time arrangements needed to be made.

This conference in New Orleans offered a comprehensive array of topics including environmental levels, analytical advances, sampling, toxicity, and impacts. A broad scope of halogenated organic pollutants was covered, including the historical focus on chlorinated dioxins and furans as well as increasing areas of attention such as microplastics and compounds such as those mentioned above.

The US EPA has recently declared that Per- and Poly- fluorinated Alky Substances (PFASs) should be considered as persistent and hazardous substances, highlighting concerns about their release into the environment, and holding the polluter responsible for cleaning up any

contamination. The use and disposal of flame retardants, including non-brominated alternatives, remains of high interest and is the subject of study for physical-chemical properties, environmental fate and transport, aquatic and mammalian toxicity, occurrence in humans and the environment, and use, market, and regulatory information.

The meeting had a strong US focus e.g., on clean-up of hazardous sites, and there were no specific sessions on occurrence in food or dietary exposure which typically has a stronger emphasis in Europe.

It was good to hear some plenary talks from established experts in the dioxin and halogenated POPs field with Linda Birnbaum drawing comparisons between the histories of dioxins and PFASs. Miriam Diamond spoke about the need for evidence based global solutions for chemical pollution to protect the next generations. Some of the key talks were also given by individuals who I was less familiar with, and this gave a refreshing new outlook on some topics. Ricardo Barra from Chile spoke about POPs in the South American environment and Hrisi Karapanagioti spoke about microplastics and their relevance to the POPs would in that they can carry them either within the matrix or adsorbed on the surface.

The session that I co-chaired with Lorraine Seed from Health Canada was on the need of good science to result in good risk management and consisted of several talks and a Panel discussion on the intersection of science and policy – in particular what lessons can be learned from dioxin. The panel discussion was attended by only around 30 people but there was some good lively debate, and this was well handled by the Panel which consisted of Brian Gullet from US EPA, William Carroll and Patrick Dyke (both consultants) and Dwain Winters (retired from US EPA).

One presentation that made a personal impact was given about a high incidence of hospitalisation rates due to respiratory and cardiovascular disease in an area of Louisiana a few hundred km away from the conference venue. Within the town of Colfax, LA, there is a facility that regularly conducts open burning of hazardous waste materials using primitive methods to ignite and burn the material. I normally associate this kind of activity with less developed countries and was surprised to find it as usual practice in this part of the USA. The burning is known to produce high levels of environmentally persistent free radicals (EPFRs) that are associated with the diseases that are prevalent in the area. The inhabitants are predominantly African American and on relatively low incomes. Many work at the facility or have livelihoods that depend on it and are reluctant to make complaints.

New Orleans offered some superb social activities such as taking advantage of a paddle boat trip on the Mississippi, jazz on Frenchmen Street, the party atmosphere on Bourbon Street, and visits to historic plantation sites and to feed the alligators on the nearby swamps and bayou. A superb gala dinner was held at Generations Hall with good music, good food and good company.

Visit the conference website www.dioxin2022.org for more information and www.dioxin20xx.org for general information including abstracts of previous conferences - the abstracts from this event will be added in due course.



Music at the gala dinner



paddle boat on the Mississippi



Martin with Arlene Blum and Linda Birnbaum



Jazz at the evening reception

[Dioxin2023 Registration is open](#)

The 43rd International Symposium on Halogenated Persistent Organic Pollutants will be held 10–14 September 2023, in Maastricht, The Netherlands.

[BFR 2022: 10th International Symposium on Flame Retardants](#)

September 4-7, 2022. Athens, Greece

The year 2022 marks the 21st anniversary of the BFR Symposia, which covers all classes of flame retardants and their impact on environmental and human health. In 2001, Professor Ake Bergman organized the first symposium in Stockholm, Sweden, and over the past 20 years, there have been major advances in the analysis, fate and toxicity of these compounds. Revised flammability regulations and policies have changed the terrain, and the gradual phase out of the PBDEs and the introduction and dominance of replacement flame retardants has posed more challenges to the scientific community. BFR 2022 included the usual topics but had a focus on chlorinated paraffins.

The European Food Safety Authority organised a special session on “EFSA risk assessments of BFRs in food”, and there were 3 plenary lectures by Alwyn Fernandes (University of East Anglia, UK), Heather Patisaul (North Carolina State University, USA) and

Roxana Suehring (Ryerson University, Canada). In total there were 38 oral and 24 poster presentations. The presentation by Alwyn gave an overview of flame retardants and chlorinated paraffins with a focus on analytical challenges, prioritisation of flame retardants of concern and their occurrence in food. Heather spoke about flame retardants and developmental neurotoxicity. Roxana gave a moving professional and personal account of the work and contributions to BFR conferences made by Mehran Alaei, who sadly passed away in April 2022 with a great loss to the BFR community.

The content and quality of presentations was outstanding. Perhaps a positive result of Covid 2019 whereby delegates had 3 years' worth of data and work to present since no conferences could take place, and with fewer opportunities to travel more practical work had been done. As discussed with colleagues at the conference, perhaps this is a new kind of bioaccumulation!

More details can be found from: <https://bfr2022.org/>



BFR 2024 will take place in April 2024 in Incheon, South Korea.

[Faces of Toxicology](#)



For those of you who have not yet checked out these videos, a playlist can be found [here](#). This video series aims to demonstrate the variety of careers available in toxicology. The series begins with an animated overview of toxicology as a science followed by individual toxicologists talking about their work. The Toxicology Group Committee is working to add further videos, so if

you are interested in being a 'face' of toxicology, please [get in touch](#).

We are continuing to add new videos; the latest is [Stephanie Wright](#) from Imperial College London talking about her work on microplastics. Some of the videos are also now available on the RSC's education platform [A Future in Chemistry](#).

Toxicology Topics in Brief

Some years ago, the RSC had an Environment, Health and Safety Committee (EHSC) that produced information Notes on various toxicology subjects. Several of the RSC Toxicology committee contributed to this work and the Notes were widely used in educational teaching. Following the disbanding of the EHSC, the Toxicology committee is working to refresh these old Notes (now called Toxicology Topics in Brief) and to add new topics.

The first four are now complete and available on our [web page](#):

↓ [Land Contamination](#)

↓ [Brominated Flame Retardants \(BFRs\)](#)

↓ [Endocrine Disruptors](#)

↓ [Food Additives](#)

Latest publications from IARC

Latest IARC Monographs Volumes 130 to 132

The IARC Monographs identify environmental factors that can increase the risk of cancer.

[IARC Monograph Volume 130](#) provides evaluations of the carcinogenicity of five industrial chemicals: 1,1,1-trichloroethane, 1,2-diphenylhydrazine, diphenylamine, N-methylolacrylamide, and isophorone. An IARC Monographs Working Group reviewed evidence from cancer studies in humans (available for 1,1,1-trichloroethane), cancer bioassays in experimental animals, and mechanistic studies to assess the carcinogenic hazard to humans of exposure to these agents and concluded that:

- 1,1,1-Trichloroethane is probably carcinogenic to humans (Group 2A)
- 1,2-Diphenylhydrazine, diphenylamine, N-methylolacrylamide, and isophorone are possibly carcinogenic to humans (Group 2B).

[IARC Monograph Volume 131](#) provides evaluations of the carcinogenicity of nine agents: cobalt metal (without tungsten carbide or other metal alloys), soluble cobalt(II) salts, cobalt(II) oxide, cobalt(II,III) oxide, cobalt(II) sulfide, other cobalt(II) compounds, trivalent antimony, pentavalent antimony, and weapons-grade tungsten (with nickel and cobalt) alloy. An IARC Monographs Working Group reviewed evidence from cancer studies in humans (available mainly for cobalt and antimony), cancer bioassays in experimental animals, and mechanistic studies to assess the carcinogenic hazard to humans of exposure to these agents and concluded that:

- Cobalt metal (without tungsten carbide or other metal alloys), soluble cobalt(II) salts, and trivalent antimony are probably carcinogenic to humans (Group 2A);
- Cobalt(II) oxide and weapons-grade tungsten (with nickel and cobalt) alloy are possibly carcinogenic to humans (Group 2B);
- Cobalt(II,III) oxide, cobalt(II) sulfide, other cobalt(II) compounds, and pentavalent antimony were each evaluated as not classifiable as to its carcinogenicity to humans (Group 3).

[IARC Monograph Volume 132](#) provides an evaluation of the carcinogenicity of occupational exposure as a firefighter. Occupational exposure as a firefighter is complex and includes a variety of hazards resulting from fires and non-fire events. Firefighters can have diverse roles, responsibilities, and employment (e.g. full-time, part-time, volunteer) that vary widely across countries and change over their careers. Firefighters respond to various types of fire (e.g. structure, wildland, and vehicle fires) and other events (e.g. vehicle accidents, medical incidents, hazardous material releases, and building collapses). Wildland fires are increasingly encroaching on urban areas. Changes in types of fire, building materials, and personal protective equipment have resulted in significant changes in firefighter exposures over time. Firefighters may be exposed to combustion products from fires (e.g. polycyclic aromatic hydrocarbons, particulate matter), building materials (e.g. asbestos), chemicals in firefighting foams (e.g. per- and polyfluorinated substances), flame retardants, diesel exhaust, as well as other hazards (e.g. night shift work and ultraviolet or other radiation).

An IARC Monographs Working Group reviewed evidence from cancer studies and mechanistic studies in humans to assess the carcinogenic hazard to humans of occupational exposure as a firefighter and concluded that:

- Occupational exposure as a firefighter is carcinogenic to humans (Group 1).

Chemistry Humour

Q: What do you do with a sick chemist?

A: If you can't helium, and you can't curium, then you might as well barium...

-----//-----

A convict was apprehended while riding a heterocycle outside the walls of a prison, but was released as he was on pyrrole.