



Welcome to Dr Federica Madia *IARC Monographs* Senior Toxicologist

Tell us about your background

I am a biologist with a doctorate in pharmacology and toxicology. I worked for many years in academia in Italy and the USA. Before joining IARC, I was at the European Commission Joint Research Centre.

What is your area of specialization?

Carcinogenicity and genotoxicity testing.

Why did you choose the IARC Monographs programme?

Mainly because of the relevance and impact of the activities carried out, and because the work so perfectly matches my strong interest in cancer hazard identification, and my background and experience.

What was your impression of your first Monographs meeting?

It was a great experience. I participated in Meeting 132 and was struck by the quantity of work done in only 8 days; how all the data were combined, integrated, and then summarized over the course of the week; and by the rigour of the process.

I was impressed by the engagement of all the Working Group members and the readiness with which they shared their knowledge and expertise; the outstanding commitment of my IARC colleagues; and the huge amount of pre- and post-meeting work carried out.

What advice would you give to early career researchers?

Always consider the impact of your own research and its potential applications and importance for society; and have fun doing science!



Call for Data

IARC is interested in identifying studies that are relevant to the carcinogenicity of the agents that will be reviewed in each volume. This includes all pertinent cancer epidemiology studies, cancer bioassays, and mechanistic evidence in both exposed humans and experimental systems. Eligible studies should be published or accepted for publication in the openly available scientific literature. Relevant exposure data (particularly from low- and middle-income countries) that are or can be made publicly available are also requested. Please see the [IARC Monographs Preamble](#) for details of the types of study that may be reviewed.

The **Call for Data** and **Call for Experts** are announced approximately 1 year before the meeting on the [IARC Monographs website](#).

Meeting 134: Aspartame, Methyleugenol, and Isoeugenol

Meeting dates: 6–13 June 2023

[Call for Data](#) closing date: 6 May 2023

[Call for Experts](#) closing date: 6 September 2022

Meeting 133: Anthracene, 2-Bromopropane, Butyl Methacrylate, and Dimethyl Hydrogen Phosphite

Meeting dates: 28 February–7 March 2023

[Call for Data](#) closing date: 28 January 2023

IARC encourages the participation of Representatives of national and international health agencies. If you are interested in serving as a Representative, contact us at imonews@iarc.fr.

Results of IARC Monographs Meeting 132: Occupational Exposure as a Firefighter

Meeting held in Lyon, France, 7–14 June 2022.

The results of Meeting 132 have now been published in [The Lancet Oncology](#).

Read the [Q&A and IARC Press Release](#).

International Agency for Research on Cancer
World Health Organization

IARC MONOGRAPHS VOL. 132: OCCUPATIONAL EXPOSURE AS A FIREFIGHTER

Occupational exposure as a firefighter is **carcinogenic to humans (Group 1)** on the basis of **sufficient evidence for cancer in humans**

GROUP 1 (Red), GROUP 2A (Orange), GROUP 2B (Yellow), GROUP 3 (Blue)

The IARC Monographs classification indicates the level of certainty that an agent can cause cancer (*hazard identification*)

Higher level of certainty (Red) to Lower level of certainty (Blue)

Cancer types with **sufficient evidence for cancer in humans**:
Mesothelioma, Bladder cancer

Cancer types with **limited evidence for cancer in humans**:
Colon cancer, Prostate cancer, Testicular cancer, Melanoma of the skin, Non-Hodgkin lymphoma

Strong mechanistic evidence in exposed firefighters
Genotoxicity, Epigenetic alterations, Oxidative stress, Chronic inflammation, Modulation of receptor-mediated effects

Exposures of firefighters include combustion products, diesel exhaust, building materials, asbestos, chemicals, shift work, ultraviolet radiation

Firefighters respond to various types of fire: Structure, Wildland, Vehicle

[Click to enlarge](#)

Firefighters respond to various types of fire and non-fire events. They may be exposed to a mixture of combustion products, chemicals in firefighting foams, flame retardants, diesel exhaust, building materials, and other hazards, such as night shift work and ultraviolet radiation. Changes in types of fire, building materials, personal protective equipment, and roles and responsibilities among firefighters have resulted in significant changes in firefighter exposures over time.

The Working Group evaluated occupational exposure as a firefighter as *carcinogenic to humans (Group 1)* on the basis of *sufficient* evidence for cancer in humans. Occupational exposure as a firefighter causes mesothelioma and cancer of the bladder. There was *limited* evidence in humans for cancers of the colon, prostate, and testis, and for melanoma of the skin and non-Hodgkin lymphoma. There was also *strong* mechanistic evidence.

Webinar: IARC Monographs – past, present, and future

In this webinar, current and former Heads of the IARC Monographs programme will gather to discuss their views on which IARC Monographs meetings have had the greatest impact on public health and cancer prevention, and what key changes to the programme were implemented under their leadership.

Wednesday 2 November 2022, 16:00–18:00 (Paris time)

Register [here](#)



Returning to Lyon for *IARC Monographs Meeting 132*



The *IARC Monographs* programme was delighted to be able to hold Meeting 132, “Occupational exposure as a firefighter”, on 7–14 June 2022, in Lyon. This was our first in-person meeting in 2.5 years, given global

disruptions to travel resulting from the coronavirus disease (COVID-19) pandemic beginning in March 2020. Capitalizing on lessons learned from experience in convening six remotely held meetings, IARC staff organized hybrid participation for Meeting 132: 23 Working Group Members, Invited Specialists, and Observers were present on-site, and 6 Working Group Members and Representatives attended remotely. Another distinctive feature of Meeting 132 is that it was the very last *IARC Monographs* meeting to be held in IARC’s current facility in Grange Blanche before the move to the purpose-built Nouveau Centre in the Gerland district of Lyon later this year. The attendees of Meeting 132 greatly appreciated the opportunity for fertile discussions and cross-disciplinary enrichment afforded by in-person participation during the 8-day meeting. The photos show the meeting participants, and the Working Group engaging in plenary discussions to finalize the evaluation of the carcinogenicity of occupational exposure as a firefighter, which was classified in Group 1 (see p. 2).



The Team

Introducing Dr Aline de Conti (top photo) and Ms Solène Quennehen (bottom photo)

Where are you from?

AdC: I am from São Paulo, Brazil.

SQ: I am from Amiens, in the north of France.

How long have you been at IARC?

AdC: I have been working for IARC for 1 year.

SQ: I worked for the Communications Group at first and moved to the *IARC Monographs* programme a year later, in 2015.

What is your role in the team?

AdC: I am a scientist in the toxicology group. My specialization is the mechanisms of carcinogenesis.

SQ: I am a project assistant – I work with the scientific team to coordinate the technical side of publication of the *IARC Monographs* (and also of the *IARC Handbooks of Cancer Prevention*).

Recommend one place in Lyon to visit: where would it be and why?

AdC: I really like Parc de la Tête d’Or. It is one of the most beautiful parks I have ever seen and surprises me every time I go there.



SQ: I would recommend walking or cycling along the Saône river; the quays were renovated recently and lead all the way from the city centre to more scenic parts of the outskirts of Lyon.

The use of mechanistic data in *IARC Monographs* evaluations

Consideration of mechanistic data is critical to understanding human cancer hazards. The increasing prominence of mechanistic data was reflected in the latest revision in 2019 of the [Preamble to the *IARC Monographs*](#), which for the first time placed mechanistic evidence alongside evidence for cancer in humans and experimental animals in the integration of evidence for the overall evaluation. This has since allowed the direct classification of two agents ([arecoline and crotonaldehyde](#)) as *possibly carcinogenic to humans* (Group 2B) solely on the basis of *strong* mechanistic evidence, despite *inadequate* evidence for cancer in humans and less than *sufficient* evidence for cancer in experimental animals.

The “10 key characteristics of carcinogens” concept is currently used by the *IARC Monographs* programme to screen and organize the scientific literature, and to assess the strength of the mechanistic evidence to support cancer hazard identification. It is a very efficient method to broadly access the scientific literature, which is constantly increasing in volume, diversity, and relevance. The United States Environmental Protection Agency, California Environmental Protection Agency, and National Toxicology Program have also illustrated the applicability of this approach. The availability of mechanistic studies has increased substantially in recent years. For example, in the recent evaluation of [cobalt metal and soluble cobalt\(II\) salts](#) by the *IARC Monographs* programme, more than 700 references related to mechanistic evidence were identified and organized according to the 10 key characteristics. Importantly, while analysing the strength of evidence, the Working Group of experts reviews all the identified references and must consider not only the quality and completeness of the studies but also the consistency and coherence of the data overall.

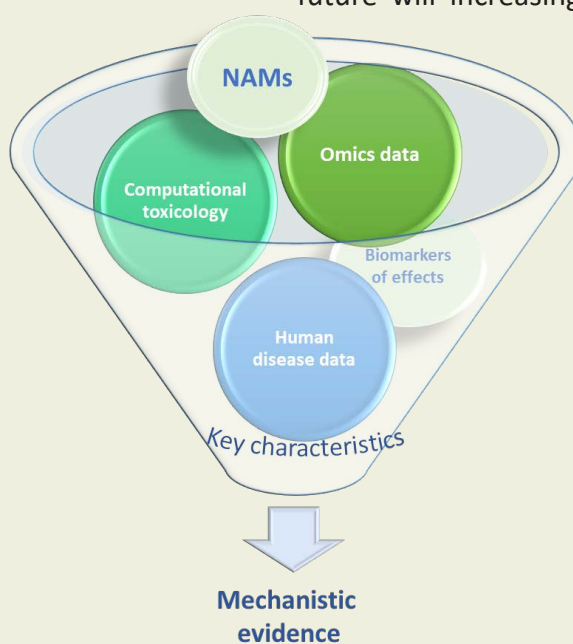
With growing confidence in the relevance of mechanistic information, it is likely that cancer hazard identification in the future will increasingly rely on mechanistic data. Thus, it is important to identify and incorporate scientific advances that provide insights into carcinogen mechanisms. For example, omics data, computational toxicology, and new-approach methodologies (NAMs) will improve mechanistic understanding and help to identify specific molecular and cellular changes related to human tumour development. The application of these advances, especially when integrated directly with new data on human disease, will enhance and support mechanistic evidence appraisal. In addition, such information can be used together with biomarkers of exposure and effects to strengthen biological plausibility connecting environmental or occupational exposure with cancer. Efforts towards the development and application of such strategies will contribute to expediting and enriching cancer hazard assessment in the *IARC Monographs* programme.

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Aline de Conti and Federica Madia



Call for Experts

Working Group Members are responsible for all scientific reviews and evaluations developed during the *IARC Monographs* meeting. The Working Group is interdisciplinary and comprises subgroups of experts in the fields of: (1) exposure characterization; (2) cancer in humans; (3) cancer in experimental animals; and (4) mechanistic evidence.

IARC selects Working Group Members on the basis of expertise related to the subject matter and relevant methodologies, and absence of conflicts of interest. Consideration is also given to diversity in scientific approaches and views, as well as demographic composition. Self-nominations and nomination of women and of candidates from low- and middle-income countries are particularly encouraged.

Nomination of Agents

For each new volume of the *IARC Monographs*, IARC selects the agents for review from those recommended by the most recent [Advisory Group Report](#), considering the availability of pertinent research studies and current public health priorities. IARC encourages the general public, the scientific community, national health agencies, and other organizations to nominate agents for review in future *IARC Monographs* volumes.

If you would like to nominate an agent, please complete the [online form](#) (one agent per form) and the accompanying WHO Declaration of Interests.

Published in 2022

IARC Monographs

March 2022: Volume 129

Gentian Violet, Leucogentian Violet, Malachite Green, Leucomalachite Green, and CI Direct Blue 218

Available from:

<https://publications.iarc.fr/603>

The Lancet Oncology

Demers P, DeMarini D, Fent K, et al. (2022). Carcinogenicity of occupational exposure as a firefighter. *The Lancet Oncology*. [Published online 1 July 2022](#).

Karagas M, Wang A, Dorman DC, et al. (2022). Carcinogenicity of cobalt, antimony compounds, and weapons-grade tungsten. *The Lancet Oncology*. 23(5):577–78. [Published online 7 April 2022](#).



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