

ISO-TOPICS: THE FIRMS NETWORK NEWSLETTER

May 2024

ABOUT US

The Forensic Isotope Ratio Mass Spectrometry (FIRMS) Network was founded to develop the scope of stable isotope techniques in forensic applications.

FIRMS brings together chemists, physicists, materials scientists, and life scientists who employ isotopic analysis in their respective fields. FIRMS is helping to focus collective knowledge and expertise on improving methods for crime detection and reduction.



Content from the 8th FIRMS Network conference was published in a special issue of *Science & Justice* with support from CSFS.

WELCOME

Welcome to the FIRMS May 2024 newsletter.

DISCLAIMER

Reference to or mention of any commercial product or process by specific trademark or manufacturer within this newsletter does not necessarily represent an endorsement by the FIRMS Network.

SPECIAL ISSUE OF SCIENCE & JUSTICE

Proceedings of the 8th Conference of the FIRMS Network have been published as a special issue of *Science & Justice*. The included articles are listed online (<https://www.sciencedirect.com/special-issue/10FFFBP3HNT>) and are also highlighted in the Publications List, below.

Seven articles from the 8th Conference of the FIRMS Network have been published in a special issue.

Guest Editors for the special issue were Chair Helen Salouros and Director Jim Carter. In an editorial, they thanked The Chartered Society of Forensic Sciences (CSFS) for hosting the virtual meeting in 2022 and the staff at *Science & Justice* for their help with the online publishing process. That appreciation is echoed again here. Thanks also to all the authors who contributed articles to the proceedings.

UPDATES FROM THE STEERING GROUP

The FIRMS Network's website (<https://www.forensic-isotopes.org/>) is being redesigned to enhance functionality for members and visitors. The Steering Group is working with native Web Design Wollongong of Australia on the redesign. **High quality images are needed for the new website.** If you think you could help with sourcing images related to isotope ratio mass spectrometry, please email news@forensic-isotopes.org.

The Steering Group is still collecting additions and updates for a 3rd edition of the *Good Practice Guide for Isotope Ratio Mass Spectrometry*. Don't forget that you can **submit suggested edits** to gpg@forensic-isotopes.org.

Please reach out with suggested additions, edits, and/or updates to the Good Practice Guide.

Finally, it's time to start planning for the **9th Conference of the FIRMS Network!** Exact date and location are to be determined, but the meeting is scheduled to take place in September 2025 in the UK. Details will be published in the October 2024 newsletter and on the website as soon as available.

NEWS AND NOTICES

The 28th Advances in Stable Isotope Techniques and Applications (**ASITA 2024**) conference will be held at Dalhousie University, Halifax, Nova Scotia, Canada 16-19 June 2024.

The 13th International Conference on the Applications of Stable Isotope Techniques to Ecological Studies (**IsoEcol 2024**) will take place 29 July 29 to 2 August 2024 at the University of New Brunswick, Fredericton, Canada.

The **1st International Summer Course on Stable Isotopes in Nature** will be held 9-13 September 2024 at the Leibniz Institute for Zoo and Wildlife Research in Berlin, Germany.

National Forensic Science Week is 15-21 September 2024. More information about this event is available online (<https://thecfso.org/national-forensic-science-week/>).

HIGHLIGHTED PUBLICATIONS

A *MethodsX* publication in 2023 and included in the Publications List of the October 2023 Newsletter described a microbalance autosampler that was open-source and that could be modified to allow for automated weighing of powdered materials (<https://www.sciencedirect.com/science/article/pii/S2215016123002054>). The article is highlighted here as it may be of particular interest for many FIRMS Network members.

As noted earlier, the special issue for the Proceedings of the 8th Conference of the FIRMS Network is now complete. Articles that are part of this issue are marked with an asterisk (*) in the below list.

PUBLICATIONS LIST

Disclaimer: This section contains a non-comprehensive list of recent publications that may be of interest to members. Inclusion does not necessarily mean that the FIRMS Network approves the content. You are encouraged to consider critically whether (i) the experimental work complies with SI guidelines and the Good Practice Guide; and (ii) the conclusions drawn are based on sound scientific background information.

Ammer STM, Routhledge N, Davies GR, et al (2024) Enhancing the contemporary human and water isotope reference database for the Netherlands: New insights from Sr-O-C-N-H isotope data. *iScience* 27:109561. <https://doi.org/10.1016/j.isci.2024.109561>

*Bowman JR, Cresswell SL, Peter T, Carter JF (2024) Once upon a twine: The Donna Steele murder investigation and an improved methodology for the comparison of synthetic twine. *Science & Justice* 64:19–27. <https://doi.org/10.1016/j.scijus.2023.11.006>

Brlík V, Procházka P, Bontempo L, et al (2024) Geographic distribution of feather $\delta^{34}\text{S}$ in Europe. *Ecosphere* 15:e4690. <https://doi.org/10.1002/ecs2.4690>

Bruenisholz E, Bunford J, Jones K, et al (2024) Operational relevance of the Sydney Declaration: The example of the Australian Federal Police (AFP) Forensics Command. *Forensic Science International* 359:112035. <https://doi.org/10.1016/j.forsciint.2024.112035>

Bunford J, Bruenisholz E, Jones K (2024) Transitioning forensic service providers to evaluative reporting: The example of the Australian Federal Police (AFP) Forensics Command. *Australian Journal of Forensic Sciences* 56:36–39. <https://doi.org/10.1080/00450618.2024.2324728>

Campanelli G, Amenta M, Bontempo L, et al (2024) Innovative tools for nitrogen fertilization traceability in organic farming products: A cauliflower case study. *Horticulturae* 10:94. <https://doi.org/10.3390/horticulturae10010094>

Carvalho MC (2023) Automated weighing in the stable isotope lab: When less is more. *MethodsX* 10:102207. <https://doi.org/10.1016/j.mex.2023.102207>

*Chesson LA, Berg GE, Edwards AJ, et al (2024) Forensic application of isotope ratio mass spectrometry (IRMS) for human identification. *Sci Justice* 64:28–37. <https://doi.org/10.1016/j.scijus.2023.11.005>

Coleman M (2024) Martian microbes research and lessons learnt for forensic science. *Science & Justice* 64:251–257. <https://doi.org/10.1016/j.scijus.2024.02.005>

*Doyle S, Chau T, Howa J (2023) IRMS based evidence passes the test. *Science & Justice* 63:743–746. <https://doi.org/10.1016/j.scijus.2023.10.002>

Ebert CE, Hixon SW, Buckley GM, et al (2024) The Caribbean and Mesoamerica Biogeochemical Isotope Overview (CAMBIO). *Scientific Data* 11:349. <https://doi.org/10.1038/s41597-024-03167-6>

Giannioti Z, Suman M, Roncone A, et al (2024) Isotopic, mycotoxin, and pesticide analysis for organic authentication along the production chain of wheat-derived products. *Food Chemistry* 452:139519. <https://doi.org/10.1016/j.foodchem.2024.139519>

Junno J-A, Väre T, Tikkanen J, et al (2024) Stable isotope analyses of carbon and nitrogen in hair keratin of suspected man-eating wolves from 1880s. *Scientific Reports* 14:4946. <https://doi.org/10.1038/s41598-024-55521-8>

*Kafino CV, De Sousa IMC, Barbieri CB, et al (2024) A proof-of-concept study: Determining the geographical origin of Brazilwood, (*Paubrasilia echinata*) with the use of strontium isotopic fingerprinting. *Science & Justice* 64:159–165. <https://doi.org/10.1016/j.scijus.2023.12.006>

Kootker LM, Ammer STM, Davies GR, Lehn C (2024) Isotopic analysis of formula milk reveals potential challenges in geolocating bottle-fed babies. *Scientific Reports* 14:3600. <https://doi.org/10.1038/s41598-024-54173-y>

*Lambrigger T (2023) Oxygen isotope variation in drinking water in Oaxaca, Mexico and its implications for forensic provenancing efforts. *Science & Justice* 63:747–754. <https://doi.org/10.1016/j.scijus.2023.10.001>

Li A, Abraham A, Islam M, et al (2024) A new approach to detecting sugar syrup addition to honey: Stable isotope analysis of hexamethylenetetramine synthesised from honey monosaccharides (fructose and glucose). *Food Chemistry* 434:137451. <https://doi.org/10.1016/j.foodchem.2023.137451>

Macan Schönleben A, Yin S, Strak E, et al (2024) Stable isotope ratios and current-use pesticide levels in edible insects: Implications on chemical food safety. *Food Research International* 179:114020. <https://doi.org/10.1016/j.foodres.2024.114020>



This newsletter was compiled and edited by Lesley Chesson. It was created using a Microsoft® Word template.

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Miller BM, Carter JF, Cresswell SL, et al (2024) Profiling ephedrine/pseudoephedrine and methamphetamine synthesised from benzaldehyde, nitroethane and dimethyl carbonate. *Forensic Science International* 360:112063.

<https://doi.org/10.1016/j.forsciint.2024.112063>

Newton PN, Chesson LA, Mayxay M, et al (2024) Forensic investigation of falsified antimalarials using isotope ratio mass spectrometry: A pilot investigation. *Scientific Reports* 14:3995. <https://doi.org/10.1038/s41598-024-54168-9>

Reid RAG, Jans MME, Chesson LA, et al (2024) The influence of taphonomy on histological and isotopic analyses of treated and untreated buried modern human bone. *Journal of Archaeological Science* 161:105901.

<https://doi.org/10.1016/j.jas.2023.105901>

Roncone A, Kelly SD, Giannioti Z, et al (2024) Stable isotope ratio analysis: An emerging tool to trace the origin of falsified medicines. *Trends in Analytical Chemistry* 174:117666.

<https://doi.org/10.1016/j.trac.2024.117666>

Skrzypek G, Dunn PJH, Imfeld G (2024) Analytical improvements and developments in stable isotope laboratories for HCNOS analyses. *MethodsX* 12:102769. <https://doi.org/10.1016/j.mex.2024.102769>

*Spencer F, Verostick K, Serna A, et al (2024) Effects of particle size, storage conditions, and chemical pretreatments on carbon and oxygen isotopic measurements of modern tooth enamel. *Science & Justice* 64:193–201. <https://doi.org/10.1016/j.scijus.2024.01.004>

*Valenzuela LO, Otero F, Loupias LL, et al (2023) BITACORA: An isotopic database of modern human tissues (keratin, teeth) for Argentina. *Science & Justice* 63:680–688. <https://doi.org/10.1016/j.scijus.2023.10.003>