

ISO-TOPICS: THE FIRMS NETWORK NEWSLETTER

October 2026

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.



Forensic Chemistry

Reminder: Proceedings of the 9th Conference of the Forensic Isotope Ratio Mass Spectrometry Network will be published in a special issue of Forensic Chemistry.

WELCOME

Welcome to the FIRMS October 2026 newsletter. To provide feedback on this newsletter, please contact us at news@forensic-isotopes.org

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.

FROM FEASIBILITY STUDY TO ROUTINE APPLICATION

On behalf of the Chair (Phil Dunn): One only has to go back through the lists of presentations at past FIRMS conferences and pick out the different matrices to see the many applications of isotope analysis in forensic science. At the 2025 conference, matrices and applications included steroids in urine for the detection of doping; analysis human remains including bones, teeth, hair, fingernails and extracted components such as collagen; insects from decomposing bodies; foodstuffs such as honey, tomatoes and extracted compounds such as vanillin and caffeine; materials for wildlife forensics such as feathers and scales, explosives, polymers and timber (including violin bows).

Assessment of data quality will be covered in detail in upcoming guidance for stable isotope databases.

Initial, small scale feasibility studies, that demonstrate the potential for isotopic analyses to glean additional information hidden to other chemical analyses, are the natural starting point. However, once feasibility has been demonstrated, the process of validating a particular measurement approach in a forensic context, where the consequences can be significant, is a significant undertaking.

Foremost, there is the need to ensure the quality of data that underpins any interpretation. This is true, not only, for in-house data but is of particular importance when using data published elsewhere to supplement in-house data. Assessing the quality of data requires an examination of measurement

methodology as this can reveal whether e.g. two isotope delta values are on the same measurement scale and can therefore be directly compared, how uncertainties have been evaluated and whether sample preparation procedures might lead to different degrees of fractionation. Upcoming FIRMS guidance for the use of stable isotope databases will cover the assessment of data quality in some detail.

There are already minimum requirements for reporting isotope delta values from IUPAC. Following these guidelines does not mean that comparability and compatibility are ensured but can be evaluated. This, in turn, maximises the usability of the data. We all have a role to play in ensuring adoption of those guidelines, whether writing, reviewing or editing manuscripts. We should also encourage critical evaluation of published methods and data before making broad statements regarding possible impacts.

Those of you who are members of the Royal Society of Chemistry or who otherwise read *Chemistry World* magazine may have noticed that Jim Carter and I wrote a letter in the October 2025 issue on a related matter.

UPDATES FROM THE STEERING GROUP

The FIRMS Steering Group (SG) recently welcomed Anastasia Edsell from the University of Amsterdam as the student representative. Additionally, Emma Kent will be joining us from NMIA, replacing Alex Doddridge who is moving on to a new adventure. The SG would like to thank Alex for joining the SG over the past two years.

Welcome to our new SG members, Anastasia and Emma!

Finally, congratulations are in order for Joe Meikle (Membership), who recently earned his PhD. Well done, Joe!

NEWS AND NOTICES

Save the date: **ASITA 2027** will take place 20-23 June 2027. This next meeting of Advances in Stable Isotope Techniques and Applications will be hosted by Memorial University in St. John's, Newfoundland (Canada).

The International Atomic Energy Agency (IAEA) is organizing an **International Symposium on Isotope Hydrology - Shaping the Future of Water: Tracers**

to Trends. The symposium is scheduled for 10–14 May 2027 in Vienna, Austria.

Finally, the 1st **Isotope Fingerprints: Global Science Insights** will take place 11-13 November 2026 at the Biotechnology Center at the University of Madison-Wisconsin (USA).

HIGHLIGHTED PUBLICATIONS

The letter published October 2025 in *Chemistry World* and referenced above in the note from the Chair is titled “Mammoth lack of peer review” and is available to subscribers of the journal. It references a 2022 IUPAC technical report and summarizes two important requirements for publishing stable-isotope delta values: “...at least two reference materials (of well characterised isotope-delta value) must be used to normalise results” and “...the assigned isotope-delta values for these materials and quality control materials must be reported.”

The 2022 technical report is available here: <https://doi.org/10.1515/pac-2021-1108>. It is also included in the below list and marked with an asterisk.

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, Kootker LM (2026) Protocol-dependent variability in $^{87}\text{Sr}/^{86}\text{Sr}$ in human hair: A cautionary note for forensic provenancing. *Forensic Science International* 389:113123. <https://doi.org/10.1016/j.forsciint.2026.113123>

Babič K, Strojnik L, Potočnik D, et al (2026) Stable isotope and multi-element analysis coupled with DD-SIMCA for verification of Slovenian pork origin and Krško polje pig authenticity. *Meat Science* 240:110166. <https://doi.org/10.1016/j.meatsci.2026.110166>

Balzani P, Belouard N, Veselý L, Kouba A (2026) The single, the whole, and the pooled: Implications of tissue choice for stable isotope analysis. *Journal of Experimental Zoology Part A: Ecological and Integrative Physiology* e70122. <https://doi.org/10.1002/jez.70122>

Brasileiro L, Costa FJV, Ramos PRR, et al (2026) Stable isotope analysis as a tool to prevent illicit wildlife trade of songbirds in Brazil. *Animal Conservation* acv.70052. <https://doi.org/10.1111/acv.70052>

Canavan A, Prechtel L, Al-Ghoul H, et al (2026) Coupling liquid chromatography to Orbitrap isotope ratio mass spectrometry: Overcoming isotope effects of chromatography and amount-dependency by peak homogenization. *Analytical Chemistry* 98:590–600. <https://doi.org/10.1021/acs.analchem.5c05530>

Capucho HLV, Oliveira JHD, Lopes R, et al (2026) Traceability of *Manilkara huberi* using stable isotope ratio analysis to support deforestation prevention in the Amazon. *ACS Omega*. <https://doi.org/10.1021/acsomega.6c03050>

Da Filicaia EG, Peggie DA, Kendall IP, et al (2026) Pyrolysis compound-specific isotope analysis of proteins in aged paintings: Diketopiperazine $\delta^{13}\text{C}$ values as collagen source indicators. *Analytical Chemistry* 98:21183–21196. <https://doi.org/10.1021/acs.analchem.5c07901>

Dos Santos ND, Dos Santos AV, Muniz MC, et al (2026) Tracing oil spill contamination in coastal and estuarine ecosystems using $\delta^{13}\text{C}$ and $\Delta^{14}\text{C}$ isotopes: A review. *Radiocarbon* 68:822–849. <https://doi.org/10.1017/RDC.2026.10204>

Eckmann JD, Beussman DJ (2026) Differentiation of cotton fabrics using stable isotope ratio mass spectrometry. *Journal of the American Society for Mass Spectrometry*. <https://doi.org/10.1021/jasms.6c00162>

Groß J, Fry B, Eggebo J, Bengtson Nash S (2026) Influence of solvent lipid extraction on tissue-specific carbon isotopes. *Ecology and Evolution* 16:e73829. <https://doi.org/10.1002/ece3.73829>

Hülsemann F, Franke L, Wissenbach DK, et al (2026) Identification of synthetic urine by analysis of stable carbon and nitrogen isotope ratios and comparison to established GC-MS/MS and LC-MS/MS analysis. *Drug Testing and Analysis* 18:1145–1151. <https://doi.org/10.1002/dta.70106>

Lee K-S, Shin W-J (2026) Recent advances in forensic application of strontium isotope analysis of human hair. *Forensic Chemistry* 50:100752. <https://doi.org/10.1016/j.forc.2026.100752>

Lima RD, Navarro AB, Newton J, et al (2026) Stable isotope data indicate origins of mislabelled historical bird specimens. *Ibis* 168:779–784. <https://doi.org/10.1111/ibi.70001>

Newsome SD, Elliott Smith EA, Mancuso CJ, et al (2026) Exploring the use of amino acid stable hydrogen isotope ($\delta^2\text{H}$) analysis to improve geographic assignment of wildlife. *Isotopes in Environmental and Health Studies* 1–19. <https://doi.org/10.1080/10256016.2026.2699461>



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

Have Feedback? Contact Us

FIRMS Network

news@forensic-isotopes.org

forensic-isotopes.org

Park J, Heraty LJ, Sturchio NC, et al (2026) Establishing Orbitrap-based methods for multi-element compound-specific isotope analysis of per- and polyfluoroalkyl substances. *Analytical Chemistry* 98:21709–21720. <https://doi.org/10.1021/acs.analchem.6c02558>

Patarnello T, Russo A, Pavlovič B, et al (2026) Isotopes, Genetic Markers and Microbiome: Tools for seafood traceability. *Reviews in Fisheries Science & Aquaculture* 1–21. <https://doi.org/10.1080/23308249.2026.2713632>

Pavlovič B, Stojnik L, Potočnik D, et al (2026) Stable isotope and multi-elemental fingerprinting for seafood authenticity: Discriminating production type and geographical origin. *Food Chemistry* 151243. <https://doi.org/10.1016/j.foodchem.2026.151243>

Shawar L, Piper T, Eiler JM (2026) Fragment-resolved carbon and hydrogen isotope analysis of urinary steroids by Orbitrap mass spectrometry. *Analytical Chemistry* 98:28201–28217. <https://doi.org/10.1021/acs.analchem.6c03178>

Silva Filho GA, Costa FJV, Nascentes CC, Nardoto GB (2026) A multi-tracer approach using stable isotopes and elements to assess provenance of *Arapaima gigas*. *Isotopes in Environmental and Health Studies* 1–21. <https://doi.org/10.1080/10256016.2026.2710121>

*Skrzypek G, Allison CE, Böhlke JK, et al (2022) Minimum requirements for publishing hydrogen, carbon, nitrogen, oxygen and sulfur stable-isotope delta results (IUPAC Technical Report). *Pure and Applied Chemistry* 94:1–10. <https://doi.org/10.1515/pac-2021-1108>

Wang W, Zhao B, Cai Z, et al (2026) Geographical traceability of bacteria based on a systematic stable isotope analysis method. *Applied Microbiology and Biotechnology* 110:27. <https://doi.org/10.1007/s00253-025-13704-x>

Yamada S, Saitoh H, Saka K, et al (2026) Multiple forensic insights for human identification using single teeth with applicability to advanced postmortem remains. *Scientific Reports* 16:25134. <https://doi.org/10.1038/s41598-026-62088-z>