ISO-TOPICS: THE FIRMS NETWORK NEWSLETTER

May 2023

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.

Consider ending your workday with a true crime podcast that features FIRMS Network member Dr. Glen Jackson discussing isotope analysis and forensic human identification.

WELCOME

Welcome to the FIRMS May 2023 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*

Reminder for participants of the 8th FIRMS Network Conference: Consider submitting your work for publication in an upcoming special issue of the journal *Science & Justice*! Guest editors are Helen Salouros and James Carter. Please contact us at firms@forensic-isotopes.org with any questions about this special issue.

Submissions are now being accepted for a special issue of Science & Justice, which is open to 2022 conference participants.

In addition, don't forget to share your feedback on the 2022 conference or any other topic related to the Network (i.e., PT schemes, Good Practice Guide, etc.). You can reach us at firms@forensic-isotopes.org. We are always interested in hearing from members.

UPDATES FROM THE STEERING GROUP

FIRMS Network member Dr. Glen Jackson (West Virginia University) was interviewed in 2022 for the true crime podcast *What Remains*: Season 1, E16, Isotope Analysis | It's in the Water. From the website –

"You know the phrase, you are what you eat? Well, it's true. Isotopes from the water we drink and the water in the food we eat can tell scientists where we live, and where we have traveled and lived in the past. Isotope analysis is quickly becoming a forensic tool that when paired with DNA testing can help

solve some of the oldest cold cases. We introduce you to an expert in the field who breaks it down for us and explains how it's been used to help solve one of the most heinous crimes in Ireland."

You can listen to the podcast here: https://www.whatremainspodcast.com/e16-isotope-analysis-its-in-the-water/

The Steering Group is currently collating additions and updates for a 3rd edition of the *Good Practice Guide for Isotope Ratio Mass Spectrometry*. **Network members are encouraged to submit suggested edits** to gpg@forensic-isotopes.org.

Reach out if you have suggested additions and updates for the next edition of the Good Practice Guide for Isotope Ratio Mass Spectrometry.

Remember that **surplus materials from prior proficiency test (PT) schemes** organized by the FIRMS Network are now available for distribution to members free of charge on a first-come, first-served basis. Available materials include: caffeine, casein, cellulose, cocoa, collagen, glycine, honey, nylon, olive oil, PVC, and sodium nitrate. Please note that containers have been opened and subsampled so user beware. Contact us at firms@forensic-isotopes.org if you are interested in any of these materials.

NEWS AND NOTICES

The Ján Veizer Stable Isotope Laboratory (formerly G.G. Hatch SIL) at the University of Ottawa, Canada, will host the 27th **Advances in Stable Isotope Techniques and Applications** (ASITA) conference 11-14 June 2023.

The IAEA will host an **International Symposium on Isotope Hydrology** in Vienna, Austria 3-7 July 2023.

The European Society of Isotopes Research's **Isotope Workshop XVI** will take place 10-14 July 2023 in Salzburg, Austria.

The 13th International Conference on the Applications of Stable Isotope Techniques to Ecological Studies (**IsoEcol**) will be held in 2024 at the University of New Brunswick in Canada.

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.

Andersson A, Piper T, Ekström L, et al (2023) Usefulness of serum androgen isotope ratio mass spectrometry (IRMS) to detect testosterone supplementation in women. Drug Testing and Analysis 15:465–469. https://doi.org/10.1002/dta.3428

Bhuiyan SA, Jameel Y, Chartrand MMG, et al (2023) Spatial variations in tap water isotopes across Canada: Tracing water from precipitation to distribution and assess regional water resources. PLOS Water 2:e0000068. https://doi.org/10.1371/journal.pwat.0000068

Bontempo L, Perini M, Pianezze S, et al (2023) Characterization of beef coming from different European countries through stable isotope (H, C, N, and S) ratio analysis. Molecules 28:2856. https://doi.org/10.3390/molecules28062856

Brlik V, Prochazka P, Bontempo L, et al (2023) Geographic distribution of feather $\delta^{34}S$ in Europe. Ecology. https://doi.org/10.1101/2023.03.10.532116

Choi H-B, Lee K-S, Park S, et al (2023) National-scale distribution of strontium isotope ratios in environmental samples from South Korea and its implications for provenance studies. Chemosphere 317:137895. https://doi.org/10.1016/j.chemosphere.2023.137895

Cormick J, Carter JF, Currie T, et al (2023) Stable isotope characterisation of 3,4-methylenedioxyphenyl-2-propanone and 3,4-methylenedioxyamphetamine prepared from piperonal. Rapid Communications in Mass Spectrometry 37. https://doi.org/10.1002/rcm.9446

Da Silva KG, Moreira MZ, Martinelli LA, De Camargo PB (2023) Isotopic characterization of Brazilian ketchup: Is tomato its main ingredient? Journal of Food Composition and Analysis 119:105275. https://doi.org/10.1016/j.jfca.2023.105275

De Caritat P, Dosseto A, Dux F (2023) A strontium isoscape of northern Australia. Earth System Science Data 15:1655–1673. https://doi.org/10.5194/essd-15-1655-2023

Gröning M (2023) Some pitfalls in the uncertainty evaluation of isotope delta reference materials. Accreditation and Quality Assurance. https://doi.org/10.1007/s00769-022-01527-6

Hobson KA (2023) Stable isotopes and a changing world. Oecologia. https://doi.org/10.1007/s00442-023-05387-w

Ippoliti P, Werlich J, Fuglsby C, et al (2023) Linking ammonium nitrate-aluminum (AN-AL) post-blast residues to pre-blast explosive materials using isotope ratio and trace elemental analysis for source attribution. Journal of Forensic Sciences 68:407–415. https://doi.org/10.1111/1556-4029.15190

Johnson JJ, Shaw PA, Wooller MJ, et al (2022) Amino acid nitrogen isotope ratios respond to fish and meat intake in a 12-week inpatient feeding study of men. The Journal of Nutrition 152:2031–2038. https://doi.org/10.1093/jn/nxac101

Kamenov GD, Swaringen BF, Cornwell DA, et al (2023) High-precision Pb isotopes of drinking water lead pipes: Implications for human exposure to industrial Pb in the United States. Science of The Total Environment 871:162067. https://doi.org/10.1016/j.scitotenv.2023.162067

Kootker LM, Ammer STM, Wescott DJ, et al (2023) Sr–Pb isotope differences in pre- and post-burial human bone, teeth, and hair keratin: Implications for isotope forensics. International Journal of Legal Medicine. https://doi.org/10.1007/s00414-023-02976-5

Lan Anh H, Duc Nhan D, Minh Quynh T (2023) Stable isotope signatures of deuterium, oxygen 18, and carbon 13 ($\delta^{2}H$, $\delta^{18}O$, $\delta^{13}C$) in imported apples available in the markets of Vietnam. Food Chemistry: X 17:100576. https://doi.org/10.1016/j.fochx.2023.100576

Lindroos EE, Bataille CP, Holder PW, et al (2023) Temporal stability of $\delta^{2}H$ in insect tissues: Implications for isotope-based geographic assignments. Frontiers in Ecology and Evolution 11:1060836. https://doi.org/10.3389/fevo.2023.1060836

Liu H, Nie J, Liu Y, et al (2023) A review of recent compound-specific isotope analysis studies applied to food authentication. Food Chemistry 415:135791. https://doi.org/10.1016/j.foodchem.2023.135791

Mancuso CJ, Ehleringer JR, Newsome SD (2023) Examination of amino acid hydrogen isotope measurements of scalp hair for region-of-origin studies. Rapid Communications in Mass Spectrometry 37:. https://doi.org/10.1002/rcm.9442

Meikle J, Jones K, Cresswell SL, et al (2023) Assessment of the stable isotope ratio variability of cling films purchased in Australia. Forensic Chemistry 33:100486. https://doi.org/10.1016/j.forc.2023.100486

Merseburger S, Kessler A, Oelmann Y, Wilcke W (2023a) Equilibrium isotope fractionation factors of H exchange between steam and soil clay fractions. Rapid Communications in Mass Spectrometry 37:e9499. https://doi.org/10.1002/rcm.9499

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

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Nair VS, Howa JD, Morrison MS, et al (2023) $\delta^{13}C$ values of urinary 19-norandrosterone in antidoping samples and potential for adverse findings from boar offal consumption. Drug Testing and Analysis dta.3470. https://doi.org/10.1002/dta.3470

Rutar JM, Strojnik L, Nečemer M, et al (2023) Determining the authenticity of spirulina dietary supplements based on stable isotope and elemental composition. Foods 12:562. https://doi.org/10.3390/foods12030562

Savkovic S, Ly LP, Desai R, et al (2022) Detection of testosterone microdosing in healthy females. Drug Testing and Analysis 14:653–666. https://doi.org/10.1002/dta.3202

Ueda M, Bell LS (2023) Paired stable carbon and oxygen isotope analyses of human enamel for forensic human geolocation: An exploratory study. Journal of Forensic Sciences 68:382–398. https://doi.org/10.1111/1556-4029.15212

Varrà MO, Zanardi E, Serra M, et al (2023) Isotope fingerprinting as a backup for modern safety and traceability systems in the animal-derived food chain. Molecules 28:4300. https://doi.org/10.3390/molecules28114300

Wassenaar LI, Sisti L, Pilecky M, Kainz M (2023) Reproducible measurements of the $\delta^{2}H$ composition of non-exchangeable hydrogen in complex organic materials using the UniPrep2 online static vapour equilibration and sample drying system. MethodsX 10:101984. https://doi.org/10.1016/j.mex.2022.101984