

ISO-TOPICS: THE FIRMS NETWORK NEWSLETTER

April 2019

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.



Don't forget to submit your abstract to the 7th FIRMS Network Conference. We look forward to seeing you in Italy in September 2019!

WELCOME

Welcome to the FIRMS April 2019 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.

UPDATES FROM THE STEERING GROUP

Abstract submission is currently open for the 7th FIRMS Network Conference. The conference will take place 16 to 19 September 2019 in San Michele all'Adige (northern Italy) at Fondazione Edmund Mach. Please visit the official conference website for details: <https://eventi.fmach.it/firms2019>

Abstracts for the 7th FIRMS Network Conference will be accepted from now until 30 June 2019

The conference opens Monday with two workshops on (1) good practice, reference materials, and accreditation; and (2) isoscapes. Dr Jason West from Texas A&M University as kindly agreed to provide the plenary lecture. We look forward to seeing you there!

The FIRMS Steering Group welcomes its newest member, Anatoly Chernyshev (Analytica Laboratories Ltd). If you are interested in joining FIRMS as an Institutional Member and nominating an individual to the Steering Group, please contact us via the website.

Three Steering Group members have recently published books that may be of particular interest to members. Jim Carter and Lesley Chesson co-edited ***Food Forensics: Stable Isotopes as a Guide to Authenticity and Origin***, published in 2017 through CRC Press. Sean Doyle authored ***Quality Management in Forensic Science***, published in 2018 via Elsevier.

Steering Group Chair and Director Phil Dunn co-organized a session at EGU 2019 on **Quality Control Tools in Stable Isotope Measurements**. FIRMS members co-authoring presentations in that session included Federica Camin and Lesley Chesson.

Finally, we note that the **FIRMS Proficiency Test Scheme has been revised from two rounds of analyses per year to one**, consisting of two different materials. Participants will still have approximately six weeks between material distribution and result submission. Please contact us if you have suggestions for materials of forensic relevance that could be distributed in upcoming tests.

Results from previous proficiency tests are archived on the FIRMS website and freely available for download

There will be an optional honey isotope proficiency test offered by LGC this year. While this test is not funded by FIRMS, some FIRMS members may be interested in participating. For details, please contact LGC Standards.

NEWS AND NOTICES

Researchers at the University of Utah have developed an iOS app to assist others in the collection of standardized metadata for water isotope samples. Named **wiSamples**, the app is freely available for download through the App Store. A user's guide and list of FAQs are available online via waterisotopes.org.

You can join the FIRMS Network LinkedIn Group to stay informed with the latest news from the FIRMS community.

*The FIRMS Network
LinkedIn Group is used to
share up-to-date news
with members and even
post job opening that may
be of interest*

Besides the 7th FIRMS Network Conference, there are several other upcoming meetings of note:

The next **International Symposium on Isotope Hydrology** will take place 20-24 May 2019 in Vienna, Austria.

The 2019 **Advances in Stable Isotope Techniques & Applications** (ASITA) conference will take place 9-12 June in Winnipeg, Manitoba, Canada.

The next **Stable Isotope Mass Spectrometry Users Group** (SIMSUG) meeting will take place 26-28 June 2019. It will be hosted by the School of Chemistry, University of Bristol (UK).

The next **International Conference on Applications in Isotope Ecology** (IsoEcol) is planned for 2020 and will be held in Gaming, Austria, at the research center Wassercluster Lunz. Dates are 31 May to 6 June.

The 2020 **Joint European Stable Isotope Users Group Meeting** (JESIUM) is scheduled to take place in Finland; no dates are currently available.

HIGHLIGHTED PUBLICATIONS

FIRMS Member Glen Jackson and his colleague Mayara Matos from West Virginia University have just published a comprehensive review of isotope ratio mass spectrometry in forensic science applications in the journal *Forensic Chemistry*: <https://doi.org/10.1016/j.forc.2019.100154>.

For those interested in “do-it-yourself” reference materials, researchers in Canada have developed three sugar reference materials for use in carbon stable isotope analysis as detailed in a recent publication in *Rapid Communications in Mass Spectrometry*: <https://doi.org/10.1002/rcm.8357>.

Additionally, researchers in China and New Zealand have developed two defatted beef reference materials for use in carbon and nitrogen stable isotope analysis; details of the development were published in *Rapid Communications in Mass Spectrometry* (<https://doi.org/10.1002/rcm.8411>).

On the topic of reference materials, “A guide for proper utilisation of stable isotope reference materials,” authored by Wolfram Meier-Augenstein and Arndt Schimmelmann, was published in the journal *Isotopes in Environmental and Health Studies* in late 2018: <https://doi.org/10.1080/10256016.2018.1538137>.

Researchers at the University of Utah, led by Gabe Bowen, have published a review of isotopes in the water cycle in *Annual Review of Earth and Planetary Sciences*. The review will be in hardcopy print in May 2019 but is available online now: <https://doi.org/10.1146/annurev-earth-053018-060220>.

Finally, the 2nd edition of *Tracing Animal Migration with Stable Isotopes* has been published (ISBN: 9780128147238). Full bibliographic details for this book and all highlighted publications can be found below.

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.

Adams S, Grün R, McGahan D, et al (2019) A strontium isoscape of north-east Australia for human provenance and repatriation. *Geoarchaeology*. doi: 10.1002/gea.21728

Bartelink EJ, Chesson LA (2019) Recent applications of isotope analysis to forensic anthropology. *Forensic Sciences Research* 1–16. doi: 10.1080/20961790.2018.1549527

Bontempo L, Barbero A, Bertoldi D, et al (2019) Isotopic and elemental profiles of Mediterranean buffalo milk and cheese and authentication of Mozzarella di Bufala Campana PDO: An initial exploratory study. *Food Chemistry* 285:316–323. doi: 10.1016/j.foodchem.2019.01.160

Bontempo L, Paolini M, Franceschi P, et al (2019) Characterisation and attempted differentiation of European and extra-European olive oils using stable isotope ratio analysis. *Food Chemistry* 276:782–789. doi: 10.1016/j.foodchem.2018.10.077

Bowen GJ, Cai Z, Fiorella RP, Putman AL (2019) Isotopes in the water cycle: Regional- to global-scale patterns and applications. *Annual Review of Earth and Planetary Sciences* 47:. doi: 10.1146/annurev-earth-053018-060220

Chartrand MMG, Meija J, Kumkrong P, Mester Z (2018) Three certified sugar reference materials for carbon isotope delta measurements. *Rapid Communications in Mass Spectrometry*. doi: 10.1002/rcm.8357

Donarski J, Camin F, Fauhl-Hassek C, et al (2019) Sampling guidelines for building and curating food authenticity databases. *Trends in Food Science & Technology*. doi: 10.1016/j.tifs.2019.02.019

Dunn PJH, Bilsel M, Şimşek A, et al (2019) Practical and theoretical considerations for the determination of $\delta^{13}\text{C}_{\text{VPDB}}$ values of methylmercury in the environment. *Rapid Communications in Mass Spectrometry*. doi: 10.1002/rcm.8453

Dunn PJH, Hill S, Cowen S, et al (2019) Lessons learned from inter-laboratory studies of carbon isotope analysis of honey. *Science & Justice* 59:9–19. doi: 10.1016/j.scijus.2018.08.003

Eftimov T, Ispirova G, Potočník D, et al (2019) ISO-FOOD ontology: A formal representation of the knowledge within the domain of isotopes for food science. *Food Chemistry* 277:382–390. doi: 10.1016/j.foodchem.2018.10.118

- Greule M, Moossen H, Geilmann H, et al (2018) Methyl sulfates as methoxy isotopic reference materials for $\delta^{13}\text{C}$ and $\delta^2\text{H}$ measurements. *Rapid Communications in Mass Spectrometry*. doi: 10.1002/rcm.8355
- Hobson KA, Wassenaar LI (eds) (2019) *Tracking Animal Migration with Stable Isotopes*, 2nd Edition. Elsevier Academic Press, London
- Holden NE, Coplen TB, Mahaffy P (2019) Isotopes Matter. *Chemistry International* 41:27–31. doi: 10.1515/ci-2019-0107
- Hoogewerff JA, Reimann C, Ueckermann H, et al (2019) Bioavailable $^{87}\text{Sr}/^{86}\text{Sr}$ in European soils: A baseline for provenancing studies. *Science of The Total Environment* 672:1033–1044. doi: 10.1016/j.scitotenv.2019.03.387
- Koehler G, Hobson KA (2018) Effects of tanning on the stable isotopic compositions of hair. *Forensic Science International*. doi: 10.1016/j.forsciint.2018.08.020
- Malinovsky D, Dunn PJH, Holcombe G, et al (2019) Development and characterisation of new glycine certified reference materials for SI-traceable $^{13}\text{C}/^{12}\text{C}$ isotope amount ratio measurements. *Journal of Analytical Atomic Spectrometry*. doi: 10.1039/C8JA00281A
- Mantha M, Kubachka KM, Urban JR, et al (2019) Economically motivated adulteration of lemon juice: Cavity ring down spectroscopy in comparison with isotope ratio mass spectrometry: Round-robin study. *Journal of AOAC International*. doi: 10.5740/jaoacint.18-0401
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- Reynard LM, Ryan SE, Tuross N (2019) The interconversion of $\delta^2\text{H}$ values of collagen between thermal conversion reactor configurations. *Rapid Communications in Mass Spectrometry*. doi: 10.1002/rcm.8396
- Strojnik L, Stopar M, Zlatič E, et al (2019) Authentication of key aroma compounds in apple using stable isotope approach. *Food Chemistry* 277:766–773. doi: 10.1016/j.foodchem.2018.10.140
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- Thomsen E, Andreasen R (2019) Agricultural lime disturbs natural strontium isotope variations: Implications for provenance and migration studies. *Science Advances* 5:eaav8083. doi: 10.1126/sciadv.aav8083
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This newsletter was compiled and edited by Lesley Chesson. It was created using a Microsoft® Word template.

Contact Us

FIRMS Network

news@forensic-isotopes.org

forensic-isotopes.org

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Van Hale R, Schofield M, Connor M, et al (2019) Stable isotope measurements to differentiate sources of monofluoroacetate in a blackmail case. *Rapid Communications in Mass Spectrometry*. doi: 10.1002/rcm.8416

Vogl J, Yim Y, Lee K, et al (2019) Certification of ERM-EB400, the first matrix reference material for lead isotope amount ratios, and ERM-AE142, a lead solution providing a lead isotopic composition at the edge of natural variation. *Geostandards and Geoanalytical Research* 43:23–37. doi: 10.1111/ggr.12253

Zhao S, Zhao Y, Rogers KM, et al (2019) Two new defatted beef reference materials CAAS-1801, CAAS-1802 for carbon and nitrogen stable isotope-ratio measurements. *Rapid Communications in Mass Spectrometry*. doi: 10.1002/rcm.8411