

BNEIR NEWSLETTER

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Biomedical National Elemental Imaging Resource

BNEIR

WHAT'S NEW
AT BNEIR?

Keeping users up to date on everything going on at BNEIR's unique shared resource

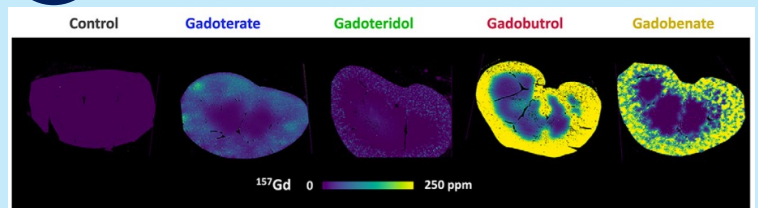


REMEMBER

- **SIMPLE IDs:** Single digits, in order of importance.
- **EMAIL MANIFEST:** Send a list of samples to match handwritten labels
- **EMBEDDING DETAILS:** Let us know if samples are paraffin or cryo-embedded



NEW USER PUBLICATION



LA-ICP-MS imaging of gadolinium in rat kidney after exposure to gadolinium-based contrast agents

Appearing in the journal [Radiology](#), BNEIR helped a collaborative team at Mass General and Harvard collect LA-ICP-MS elemental images of gadolinium (Gd) distribution in rat kidney. This was a critical component of a study to understand Gd biodistribution and speciation after administration of different Gd-based contrast agents (GBCAs). [Gadobutrol](#) showed differential accumulation characteristic with different GBCA compounds.

The cortex accumulated the highest Gd concentration 17 days after administration: more than any of the 23 other organ, tissue and fluid specimens evaluated.

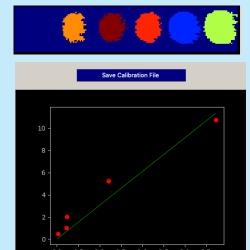
The study showed that gadoteridol had the lowest level of retention in this organ when compared to other GBCAs (Figure above), important findings for establishing the safety of GBCAs.

FILE SHARING AT
BNEIR

Now that image collection with the new LA-ICP-TOF-MS instrumentation is finally keeping pace with user demand, and with data files often reaching 2-3 GB each, we are facing challenges of data storage and transfer to users. Our procedure has been to upload images and data to a Dartmouth-sponsored Dropbox folder, but institutional compatibility issues have been an obstacle. **Users are encouraged to check their access to file sharing platforms so you can access your data as soon as possible.**

SOFTWARE UPDATE:
Micro Analysis Toolkit

Users can now use Sam's Micro Analysis Toolkit to view, rescale, quantify and statistically analyze elemental imaging data from a wide variety of sources, including raw .vit files from BNEIR's new LA-ICP-TOF-MS instrument. Find installation instructions [here](#).



Multi-point calibration of scanned gel standards, one of the many new features of the Micro Analysis toolkit



NEW USER



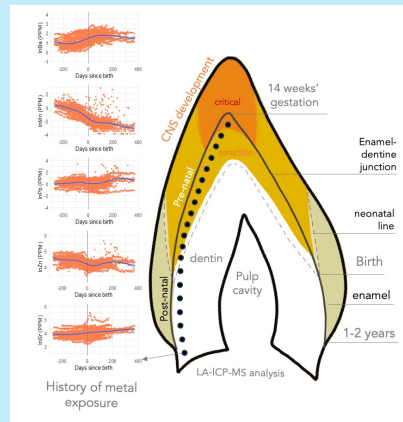
Michael Petris, PhD
Professor of
Biochemistry
University of Missouri
School of Medicine

Michael Petris PhD, professor of Biochemistry at the University of Missouri School of Medicine, works on the role of copper in physiological and pathophysiological processes, including cancer cell metastasis, fibrosis, scar formation and host-pathogen interactions during microbial infection.



BNEIR PUBLICATION

LA-ICP-MS analysis of baby teeth can show a history of exposure to environmental metals during critical developmental periods. Having processed and analyzed more than 1000 teeth, BNEIR published a methodological study that quantitatively compares teeth from three contrasting human cohort studies, from Nigeria, New Hampshire and from the St. Louis Baby Tooth Study.



[“Quantified retrospective biomonitoring of fetal and infant elemental exposure using LA-ICP-MS analysis of deciduous dentin”](#) in the Journal of Exposure Analysis and Environmental Epidemiology. 10.1038/s41370-024-00652-3



WHERE IN THE WORLD...?

BNEIR had particularly strong representation at the 2024 Winter Conference on Plasma Spectrochemistry. While the rest of lab kept BNEIR running through typical New Hampshire winter weather, Brian, Ramsey and Matt learned about the latest advances in laser ablation, while enjoying the balmy temperatures.

2024 Winter Conference on Plasma Spectrochemistry
Tucson, Arizona, January 15 - 21, 2024



Left to Right:

- Dula Amarasiriwardena (Emeritus Professor of Chemistry, UMASS, Amherst)
- Brian P. Jackson,
- Ramsey Steiner,
- Matt N. Barr



NEW STAFF

At the start of 2024, BNEIR warmly welcomed new Research Technician Matt Putnam-Pouliot to the sample preparation lab. Matt comes to us with a background in both graphic design from Castleton State College and environmental sciences from the Community College of Vermont. His role is in sample preparation and LA-ICP-MS analysis of deciduous baby teeth, overseeing close to 1000 specimens.



UPCOMING EVENTS

[Trace Elements in Biology and Medicine](#)
Melbourne, FL
9-13 JUN 2024

[9th International Symposium on Metallomics](#)
London, UK
17-21 JUN 2024



To help BNEIR track its impact, it is imperative that you include this acknowledgement statement when presenting or publishing BNEIR-generated data: “LA-ICP-MS elemental imaging was performed at the Dartmouth Biomedical National Elemental Imaging Resource (BNEIR) supported by NIGMS R24GM141194 and 1S100D032352.”