

BNEIR NEWSLETTER

Brian P Jackson, Director

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Biomedical National Elemental Imaging Resource



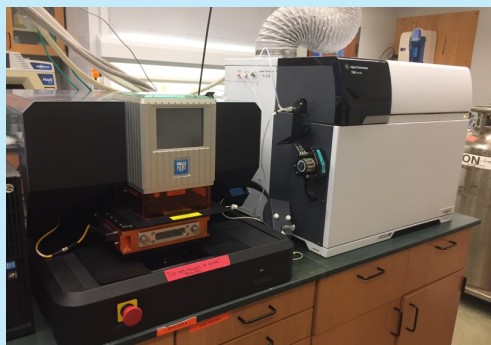
WHAT'S NEW AT BNEIR?

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



NWR213 REPAIRED

Users who need the 213nm laser can once again send samples. The unit was repaired and has been busily blasting its way through the summer backlog.

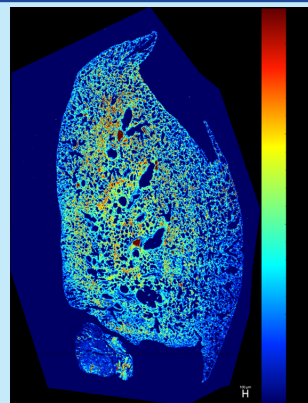


NEW USER SPOTLIGHT



Jorge Vidal is an Associate Professor at the University Mississippi Medical Center, at the Department of Cell and Molecular Biology.

Jorge's research focuses on the molecular pathogenesis of *Streptococcus pneumoniae* (pneumococcus), the molecular epidemiology of pneumococcal disease. His work on the mechanisms that contribute to cell death in the lung during pneumococcal pneumonia made use of BNEIR's new Vitesse LA-ICP-TOF-MS and a manuscript under preparation, and will be important in pointing toward potential therapies



WHICH INSTRUMENT IS RIGHT FOR YOUR WORK?

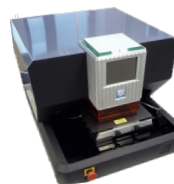
| PRIORITIES | 1 | 2 |
|------------------------------------|---|---|
| SPEED | ✓ | |
| SENSITIVITY | | ✓ |
| <5 μm RESOLUTION | ✓ | |
| UNTARGETED | ✓ | |
| BIOMINERALS (teeth, bones, stones) | | ✓ |

Vitesse



1

213



2

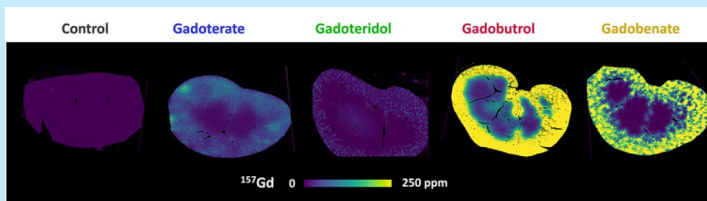


USER PUBLICATION

The safety of Gadolinium Based Contrast Agents (GBCAs) has been under scrutiny. Le Fur et al compared the pharmacokinetics, distribution and speciation of four GBCAs in 32 healthy rats using magnetic resonance imaging, mass spectrometry, **elemental imaging** and electron paramagnetic resonance spectroscopy. This prospective animal study found a difference in excretion and retention properties among macrocyclic GBCAs. The highest concentration of gadolinium was retained in the kidney cortex.

Radiology

Gadolinium-based contrast agent biodistribution and speciation in rats



<https://pubs.rsna.org/doi/epdf/10.1148/radiol.230984>



SAMPLE SUBMISSION CHECKLIST

Send us your samples for imaging!

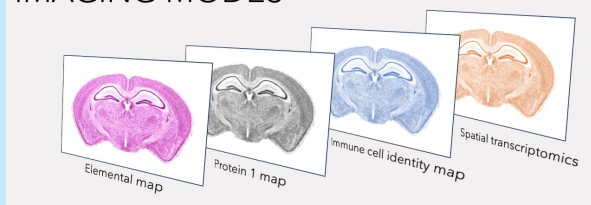
- **Digital manifest:** Email us an Excel spreadsheet listing your samples.
- **Simple IDs:** Use simple, non-informative IDs: e.g., 1, 2, 3: it makes the analysis unbiased (“blinded”) and prevents typos (we will re-number the digital manifest otherwise).
- **Spare:** Send us any extra/non-perfect sections so we can optimize acquisition parameters (e.g., attenuate any high abundance elements that might saturate the detector).



WHERE IN THE WORLD...?

SLAC NATIONAL ACCELERATOR LABORATORY

IMAGING MODES



BNEIR Co-director Tracy Punshon was invited to speak at a workshop entitled “Multi-Modal XRF Imaging to understand Complex Processes in Biological, Geochemical and Environmental Systems at the Stanford Synchrotron Radiation Light Source’s Annual User’s meeting (September 24-29). She showed the interface with the LA-ICP-MS world.



NEW BNEIR STAFF: Brian Beukema



Brian is from Kalamazoo, Michigan and graduated from Georgetown’s Environmental Metrology and Policy program in 2023. Brian got his Bachelor of Science in Geology with a minor in Group Science at Western Michigan University. After graduating, he worked at the Michigan Geological Survey where he aided hydrogeologic investigations of PFAS. His interests are in structural geology, geomorphology, and spectroscopy. At BNEIR Brian works on solution-mode ICP-MS analysis.



UPCOMING EVENTS



[2024 Winter Conference on Plasma Chemistry](#)
Tucson, AZ
15-20 JAN 2024



To help BNEIR track its impact, please 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.”