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Accelerator Mass Spectrometry: A rare, underutilized resource in the life sciences at Purdue University

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Accelerator Mass Spectrometry (AMS) is an isotope ratio mass spectrometer with an incredibly low detection limit (1 part in 10^{15} or 10^{16}). Geologists and archaeologists have used this technique for decades to measure long-lived radionuclides that are rare in the environment due to their rate of decay. It is only relatively recently that AMS has been used in the biological community. The low detection of AMS creates an opportunity to trace physiologically relevant doses and investigate long-term effects (i.e. greater than the biological life of the subject) while alleviating concerns about dosing and waste disposal. An AMS is available in the Purdue Department of Physics and Astronomy at the Purdue Rare Isotope Measurement Laboratory (PRIME Lab). Since 1999 over 30 research projects in the biological and environmental sciences have taken place at PRIME Lab. The BioMed sub-group at PRIME has successfully assisted in experiments investigating Carbon-14, Calcium-41, and Aluminum-26. Future directions include Iodine and Manganese. This talk will briefly discuss how the AMS works. Further, there will be an overview of several projects that will illuminate the power of the technique and catalyze collaborations in toxicology. Finally, common hurdles with the technology and application will be addressed reports of current solutions being implemented.

Biography

Jessica Christian often explains to people that she "has a degree in Biology to do Chemistry for the Physics Department". After obtaining her BS in Biological Sciences she went straight into the industry at working with an *Agrobacterium* transformation team on Soybean and Canola plants before turning back to Purdue to work under Dr George Jackson. Together, they make up the PRIME (Purdue Rare Isotope Measurement) Laboratory Bio-Medical sub-group. Her multi-disciplinary job title and experience lend themselves well to communicating with collaborators from all areas of the life sciences, from veterinary medicine to nutrition and now with a focus on breaking into the field of toxicology. She is currently working with a team focused on anti-oxidant metabolism and another examining calcium resorption in pre-menopausal women.

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