



Summer 2019

University Of New Mexico

Metal Exposure and Toxicity Assessment on Tribal Lands in the Southwest (METALS)

Superfund Research and Training Center

Research Project Highlights



Modulation of Uranium and Arsenic Immune Dysregulation by Zinc

Many different metals are found in abandoned uranium mine and milling waste sites throughout the Navajo Nation. These metals can get into your body through food, water or dust. Studies have shown that metals such as uranium and arsenic can damage cells in your body. There is information that damage from metals may be reduced when enough zinc is present. This research study will ask whether taking daily zinc pills at the USDA recommended daily allowance helps to protect the body from the effects of exposure to harmful metals.

This project has partnered with the Red Water Pond Road Community Association, Tachee Uranium Concerns Committee and the Blue Gap/Tachee Chapter

[Click here for more information about recent activities.](#)

Trainee Updates

Nabil Shaikh Awarded KC Donnelly Externship

Nabil Shaikh was awarded a KC Donnelly Externship Award to learn an advanced technique called electrospinning. This technique creates electrospun nanofiber mats (ENM) with specific chemistry for binding pollutants.

Nabil works with University of New Mexico METALS Research Project Immobilization of Uranium, Arsenic, and Co-occurring Metals in Mine Wastes (Cerrato, PI). He will be traveling to the University of Iowa SRP Center to work with Keri Hornbuckle, Ph.D., and Andres Martinez, Ph.D. for this externship.

[Read more about this award](#)

Dr. Sebastian Median Defends Dissertation

Dr. Sebastian Medina successfully defended his dissertation titled, "Mechanisms of Arsenic-Induced Suppression of Early Red Blood Cell Development" February, 2019. Sebastian is now a post-doctoral researcher at the University of New Mexico. Congratulations Sebastian!

Jennifer Ong awarded Top 5 poster for mixtures research

University of New Mexico Doctoral candidate **Jennifer Ong** was awarded Top 5 for mixtures abstract for her poster at the 58th Annual Society of Toxicology Meeting. Her poster was titled, "Cytokine Expression Profiles and Metals Exposure Cluster Analysis within a Population Study"

Jessica Begay Wins Poster Presentation Award

Graduate student **Jessica Begay** won 2nd place poster award at the University of New Mexico College of Pharmacy Research Day, April 10th, 2019. Her poster was titled, "In Vivo Toxicity Assessment of Metal Contaminated Wind Blown Particulate Matter from an Abandoned Uranium Mine on the Navajo Reservation."

Community Engagement and Research Translation Updates

Indigenous Cultural Training Events

The UNM METALS SRP Community Engagement and Research Translation Cores organized and moderated two cultural training sessions for SRP trainees, faculty, and community members (October 2-3, 2018 and May 29-30, 2019).

Nearly 60 individuals, including 16 trainees and 13 community members, participated in these events.



Thank you to all who organized and participated in these events!

[Click here for more information about this event.](#)

SRP Cross Center Collaborations

Zuni Painter Translates Science Into Art

Artist Mallery Quetawki work was subject of a recent article in "Sustain" produced by the *SRP Center at the University of Louisville* "Indigenous Ways

[View the article in *Sustain*](#)

Other News and Events

Dr. Erica Dashner-Titus (former UNM METALS SRP Trainee and now Assistant Research Professor, College of Pharmacy) was awarded first place for her poster presentation at the UNM College of Pharmacy Research Day, April 10th, 2019.

UNM METALS Project Featured in Community Newspaper

The METALS Toxic Metals in Airborne Particulate Matter Originating from Abandoned Uranium Mine Sites Research Project was featured in The Town Crier, Pueblo of Laguna (POL) Community Newspaper, April 2, 2019. The article featured the partnership between POL Environment & Natural Resources Dept. and UNM METALS SRP Environ Project 2 (Gonzales, PI) to monitor PM in villages to the Jackpile mine (NPL).

Recent Publications and Presentations

Publications

- Bolt, A. M., Medina, S., Lauer, F. T., Liu, K. J., & Burchiel, S. W. (2019). Minimal uranium immunotoxicity following a 60-day drinking water exposure to uranyl acetate in male and female C57BL/6j mice. *Tox Applied Pharm.* 372:33-39
- DeVore, C. L., Rodriguez-Freire, L., Mehdi-Ali, A., Ducheneaux, C., Artyushkova, K., Zhou, Z., ... & Cerrato, J. M. (2019). Effect of bicarbonate and phosphate on arsenic release from mining-impacted sediments in the Cheyenne River watershed, South Dakota, USA. *Environmental Science: Processes & Impacts*, 21(3), 456-468.
- Velasco, C. A., Artyushkova, K., Ali, A. M. S., Osburn, C. L., Gonzalez-Estrella, J., Lezama-Pacheco, J. S., ... & Cerrato, J. M. (2019). Organic Functional Group Chemistry in Mineralized Deposits Containing U (IV) and U (VI) from the Jackpile Mine in New Mexico. *Environmental science & technology*.

58th Annual Society of Toxicology Meeting (full program available [here](#))

- Effects from Airborne Metal-Enriched Particulate Matter from an Abandoned Uranium Mine. J. Tworek, B. Sanchez, F. Baldwin, A. Wheeler, G. Herbert, S. Lucas, M. Morishita, B. Bleske, M. Campen, M. Paffett, and K. Zychowski.
- In Vivo Toxicity Assessment of Metal Contaminated Wind Blown Particulate Matter from an Abandoned Uranium Mine on the Navajo Reservation. J. Begay, Y. Ordonez, S. Lucas, B. Sanchez, A. Wheeler, F. Baldwin Jr., G. Herbert, C. Shuey, J. Harkema, J. Wagner, M. Morishita, B. Bleske, and M. Campen.
- Effects of Multi-Walled Carbon Nanotube Exposure on Brain Oxidative Stress and Inflammation in C57BL/6 Mice. T. L. Young, G. Herbert, S. Lucas, B. Sanchez, J. Begay, A. K. Ottens, A. Erdely, and M. Campen.
- Low-Level Arsenic Exposure Impairs the In Vitro Differentiation of Mouse Bone Marrow Erythroid Progenitor Cells. S. Medina, X. Zhou, A. Bolt, H. Xu, F. Lauer, K. Liu, and S. Burchiel.
- Tungsten Enhances Cancer-Associated Fibroblast Activation from Bone Marrow-Derived Mesenchymal Stromal Cells. B. Stevens, and A. M. Bolt.
- Minimal Uranium Immunotoxicity following a 60-Day Drinking Water Exposure to Uranyl Acetate in Male and Female C57BL/6J Mice. A. M. Bolt, S. Medina, F. T. Lauer, K. J. Liu, and S. W. Burchiel.

- Cytokine Expression Profiles and Metals Exposure Cluster Analysis within a Population Study. J. Ong, S. McClain, Li Luo, J. Hoover, E. Erdei, J. Lewis, and D. MacKenzie. University of New Mexico, Albuquerque, NM.

University of New Mexico College of Pharmacy Research Day

- J. Begay, Y. Ordonez, S. Lucas, B. Sanchez, A. Wheeler, F. Baldwin Jr., G. Herbert, C. Shuey, J. Harkema, J. Wagner, M. Morishita, B. Bleske, and M. Campen. In Vivo Toxicity Assessment of Metal Contaminated Wind Blown Particulate Matter from an Abandoned Uranium Mine on the Navajo Reservation.
- Tungsten Enhances Cancer-Associated Fibroblast Activation from Bone Marrow-Derived Mesenchymal Stromal Cells. B. Stevens, and A. M. Bolt. Selective inhibition of erythropoiesis by environmental arsenic exposure through interrupting GATA-1 zinc finger.
- Sebastian Medina, Xixi Zhou, Alicia M. Bolt, Huan Xu, Fredine T. Lauer, Shu Chun Wang, Scott W. Burchiel, and Ke Jian Liu (1st place poster – Pharmaceutical Sciences Graduate Student) Uranyl acetate directly interacts with PARP1, leading to DNA binding inhibition and DNA degradation.
- Bingye Xue, Xixi Zhou, Jim Liu Arsenic and uranium exposure elicits differential responses in human immune cells.

Previous Newsletters

[Summer 2018](#)



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