

## CURRICULUM VITAE

Date Prepared: August 2021

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**EDUCATION:**

7/2001-7/2005	Medical Physics	Ph.D.	McMaster University, Canada
5/2000-7/2001	Medical Physics	M.Sc.	McMaster University, Canada;
9/1992-7/1996	Nuclear Physics	B.Sc.	Zhongnan University of Technology, China

**APPOINTMENTS and/or RESEARCH FELLOWSHIPS**

8/2021-	Professor, School of Health Sciences, Purdue University
7/2015-7/2021	Associate Professor, School of Health Sciences, Purdue University
8/2009-7/2015	Assistant Professor, School of Health Sciences, Purdue University
9/2008-present	Adjunct Assistant/Associate/Full Professor, University of Michigan School of Public Health
8/2010-present	Assistant/Associate/Full Professor (courtesy), School of Nuclear Engineering, Purdue University
6/2019-10/2019	Visiting Professor, DESY Research Center, Hamburg, Germany
11/2019-12/2019	Visiting Professor, PAL Research Center, POSTECH, South Korea
10/2005-8/2009	NIEHS Research Fellow/Associate, Director, XRF Laboratory, Department of Environmental Health, Harvard School of Public Health Mentors and collaborators: Dr. Howard Hu; Dr. Marc Weisskopf; Dr. Robert Wright
7/2005-10/2005	NSERC Research Fellow, Department of Medical Physics and Applied Radiation Sciences, McMaster University
5/2000-7/2005	Research Assistant and Teaching Assistant, Department of Medical Physics and Applied Radiation Sciences, McMaster University
8/1998-4/2000	Research Associate, Nuclear Physics Department, China Institute of Atomic Energy (CIAE)
6/1996-8/1998	Research Assistant, Nuclear Physics Department, CIAE

**HONORS**

2015	Early Career Research Achievement Award, College of Health and Human Sciences, Purdue University
2019	Seed for Success Award, Purdue University
2019	Fulbright Global Scholar Award
2021	HHS Outstanding Graduate Faculty Mentor Award, Purdue University

**MAJOR RESEARCH INTERESTS:**

- Development, Validation, and Application of Non-invasive Neutron Activation Analysis Technology to Quantify Metals and Trace Elements in Bone and Soft Tissue In Vivo.
  - Quantification of manganese (Mn) and aluminum (Al) in bone, and association between Mn/Al expoGsures and neurodegeneration
  - Quantification of sodium (Na) and potassium (K) in bone and soft tissue, Na/K intake, storage, biokinetics, and hypertension and cardiovascular diseases (CVD)
  - Quantification of magnesium (Mg) in bone, and association between Mg exposure and varies health outcomes
  - Quantification of other metals and trace elements in human tissues and small animals in vivo, and applications in biology and health sciences

- Health effect of exposure to metal mixtures
- Development, Validation, and Application of a Non-invasive X-ray Fluorescence (XRF) Technology to Quantify Metals and Trace Elements in Bone, Toenail, and Skin In Vivo.
  - Quantification of lead (Pb) and gadolinium (Gd) in bone using an advanced Cd-109 induced k-x-ray fluorescence (KXRF) system
  - Quantification of Pb and strontium (Sr) in bone, and manganese (Mn), mercury (Hg), zinc (Zn), and selenium (Se) in toenail using a portable XRF device
  - Quantification of arsenic (As) in skin using a portable XRF device
  - Quantification of metals in bone using a portable KXRF system
  - Pb exposure and neurodegeneration (Alzheimer's Disease and Parkinson's Disease); Pb exposure and neurodevelopmental effect
  - Sr exposure and bone diseases
  - Health effects of exposure to metals individually and combined
- Development and Application of Synchrotron X-ray Technologies to Study Metal and Human Health.
  - Synchrotron micro XRF to map metals in bone, tooth, and brain tissues
  - Synchrotron x-ray absorption near edge structure (XANES) to determine elemental speciation
  - Synchrotron micro- and nano- tomography
  - Application of the synchrotron x-ray technologies in metal toxicology and health, neurodegeneration, and mechanism studies
- Development and Validation of Other Neutron Technologies in Medicine.
  - Associated particle elemental imaging (APEI) technology to determine elemental distribution and diagnose diseases associated with elemental alteration at an early stage
  - Neutron generator based boron neutron capture therapy (BNCT) system for cancer treatment
- Biological Effects of Radiation Exposure, and Combined Exposure of Metal and Radiation.
- General Nuclear Physics and Instrumentation Development in Interdisciplinary and Multidisciplinary fields

## **MEMBERSHIPS**

- 2009 – present, Society of Toxicology (SOT)
- 2006 – present, American Association of Physicists in Medicine (AAPM)
- 2007 – 2012, The American Academy of Clinical Toxicology (AACT)
- 2006 – 2012, American Physical Society (APS)

## PAPER REVIEW

### Editorial board

Associate Editor, Applied Radiation and Isotopes, 2020 –  
 Editorial Board/ International Advisory Board member, Physiological Measurements, 2019 –

### Regular reviewer for the following Journals:

Physics in Medicine and Biology, Journal of Analytical Atomic Spectrometry, Science of the Total Environment, Biomarkers, Measurement Science and Technology, Nuclear Instruments and Methods in Physics Research B, Toxicology Letters, Nature Scientific Report, Journal of Environmental Monitoring, X-ray Spectrometry, Applied Radiation and Isotopes, International Journal of Environmental Health Research, Physics G, AECL Nuclear Review, Environmental Science, Analytical Methods, IEEE Nuclear Transactions, Environmental Health, Physiological Measurements, Journal of Alzheimer's Disease, Biomedical Physics and Engineering Express, Environmental Science Processes & Impacts, Child: Care, Health & Development, etc.

### GRANT REVIEW COMMITTEE:

CDC/NIOSH Occupational Safety and Health Education and Research Centers (ERC) study section special emphasis panel review, standing member, 2014-2020

CDC/NIOSH Occupational Safety and Health Regular Grants Study Section (SOHSS), Ad Hoc, 2020 –

Mitacs Elevate Postdoctoral Fellowship review, Dec.2013 (ad hoc)

Portuguese Foundation for Science and Technology (FCT), Sep. 2012 (ad hoc)

NIH study section panel review, ZES1 SET-D (RV), Mar. 2011 (ad hoc)

Canadian Light Source (CLS) application review, Apr. 2011 (ad hoc)

### TEACHING

2010-present Instructor for Health Sciences course HSCI534 "Applied Health Physics", Purdue School of Health Sciences

2010-present Instructor for Health Sciences course HSCI514 "Radiation Instrumentation Lab", Purdue School of Health Sciences

2010-2012 Instructor for Health Sciences course HSCI390 "Radiological Emergency Management", Purdue School of Health Sciences

Guest lecturer for HSCI313 "Principles of Radiation Detection and Measurement", HSCI202 "Essentials of Environmental, Occupational, and Radiological Health Sciences", HSCI540 "Radiation Biology", HSCI560 "Toxicology", HSCI575 "Introduction to Environmental Health", and PHYS235 "Seminar in Careers in Physics".

### MENTORING

#### Doctoral Student Committees – Chair and Major Advisor

- 2011-2015, Dr. Yingzi Liu;  
 Dissertation: *A Compact In Vivo Neutron Activation Analysis System to Quantify Manganese In Human Hand Bone*  
Current position: Assistant Professor, Emory University

- 2012-2016, Dr. Aaron Specht;  
Dissertation: *X-ray Fluorescence for Quantification of Lead and Strontium In Vivo*  
Current position: Assistant Professor, Purdue University
- 2014-2018, Dr. Mindy Joo;  
Dissertation: *A Deuterium-deuterium (DD) Neutron Generator-based Boron Neutron Capture Therapy System*  
Current position: Medical Physicist, Inova Fairfax Hospital
- 2014-2019, Dr. Michael Abel;  
Dissertation: *Associated Particle Neutron Elemental Imaging for Noninvasive Medical Diagnostics*  
Current position: Medical Physics Resident, IUSM
- 2015-2020, Dr. Xinxin Zhang;  
Dissertation: *In Vivo Neutron Activation Analysis to Quantify Sodium in Bone and Soft Tissue*  
Current position: Medical Physics Resident, Department of Radiation Oncology, Rutgers University
- 2017-2020, Dr. Mychaela Coyne;  
Dissertation: *Development and Validation of In Vivo Portable XRF Technology to Quantify Lead and Strontium in Bone and Manganese and Mercury in Toenail*  
Current position: Medical Physics Resident, Department of Radiation Oncology, University of Colorado Denver
- 2012-21, Dr. Patrick Byrne (part-time);  
Dissertation: *Simulation and Development of a Transportable Neutron Activation Analysis System for the Assessment of Aluminum In Vivo*  
Current position: Senior Medical Physics Consultant, Medical Physics Consultation Inc.
- 2017-present, Sana Tabusum;  
Dissertation: *In Vivo Neutron Activation Analysis (IVNAA) to Quantify Potassium (K) and Sodium (Na) in Human Body and Small Animals*  
Current position: Postdoctoral fellow, TRIUMF National Accelerator Center/ Winsor University, Canada (to be started)
- 2019-present, Alexis Webb
- 2021-present, Song Yue

#### **Doctoral Student Committees – Member**

Victor Wu (2009-2013), Panda Anshuman (2009-2012), Sandra cole (2009-2012), Junqing Wu (2010-2013), Huisi Ai (2010-2013), Qingya Zhao (2010-2013), Shiv Srivastava (2011-2014), Kyuhak Oh (2012-2016), Alex Bakken (2013-2017), Haoyu Wang (2012-2018), Danelle Rolle

(2013-2018), Christelene Horton (2015-2019), Mina Tehrani (2015-2019), Zainab Hasan (2015-2019), Andrew Boria (2016-2020), Shraddha Rane (2016-2020), Aaron Andersen (2016-present), Yiu Hsin Chang (2020-present), Emily Bragers (2020-present)

### **Masters Student Committees – Chair and Major Advisor**

- 2009-2012, Steven Sanchez; current position: unknown
- 2010-2012, James Dant;  
Dissertation: *Alpha and Beta Emitters Dose to Bone and Marrow Using a Trabecular Bone Model for All Ages*  
Current position: Senior Scientist, Assistant Group Leader, Applied Research Associates, Inc.
- 2012-2014, Gopal Subedi;  
Current position: Medical Physicist, St. Anthony Medical Center, St. Louis, MO
- 2013-2015, Daniel Sowers;  
Dissertation: *A Dosimetry Study of Deuterium-Deuterium Neutron Generator-based In Vivo Neutron Activation Analysis*  
Current position: Head of the Radiation Health Division, Naval Branch Health Clinic, Portsmouth, NH
- 2014-2016, Lee Alleman;  
Dissertation: *A Dose Distribution Study of Uranyl Nitrate in Zebrafish Using Liquid Scintillation And Passivated Implanted Planar Silicon Detector*  
Current position: Radiation Safety Officer, US Navy
- 2014-2016, Yufei Wang;  
Current position: PhD student, UC Berkeley
- 2015-2017, Mychaela Coyne;  
Dissertation: *Quantification of Sodium (Na) in Bone with In Vivo Neutron Activation Analysis (IVNAA) and Its Implications on Na Retention Studies*  
Current position: Medical Physics Resident, Department of Radiation Oncology, University of Colorado Denver
- 2016-2018, Kevinraj Sukumar;  
Dissertation: *Detection of Arsenic (As) in Skin In Vivo Using Portable X-ray Fluorescence (XRF) Device*  
Current position: Medical Physics Resident, Piedmont Atlanta Hospital
- 2017-2019, Colby Neumann;  
Dissertation: *In Vivo Quantification of Magnesium in Hand Bone Using Neutron Activation Analysis*  
Current position: Medical School Student, Kansas State

- 2020-present, Elizabeth Jaye
- 2021-present, MacKinzie Coon

### **Masters Student Committees - Member**

Patrick Meek (2009-2011), Christina Peace (2009-2011), Courtney Tinner (2010-2012), Jefferey Bainter (2012-2014), Austin Curtis (2012-2014), Han Xu (2012-2014), John Carrico (2013-2015), Mitchell Gagne (2014-2016), Eric Cleveland (2015-present), Kelly Dwyer (2015-present), Andrea Wilkerson (2015-present), Etc.

### **Undergraduate Student Mentoring – Major Advisor**

Aaron Specht (2010-2012), Isha Kaul (2012-2014), Jacob Wilson (2013-2014), Scott Blake (2013-2015), Austin Trout (2013-2014), Nikola Plavsa (2014-2015), Megan Sewell (summer 2016), Nicholas Farley (2017-2018), Joseph Whitehead (2017-2018), Emma Wallens (2015-2019), Boghos Taslakjian (2016-2019), Kehan Liu (2018-2019), Emily Paul (summer 2019), Sai Dwibhashyam (2019-present), Catherine Zhu (2020-present)

### **Post-doctoral fellow - Mentor**

2014-2016, Dr. Farshad Mostafaei;

Current position: Assistant Professor and Associate Director of the Medical Physics Program, Augusta University

2015-2016, Dr. Yingzi Liu;

Current position: Assistant Professor, Emory University

2019-present, Dr. Pinjing Cheng;

Current position: Association Professor, University of South China

### **BIBLIOGRAPHY:**

**Peer-reviewed publications** (\* indicates corresponding author(s); trainees in Dr. Nie's lab are underlined)

1. Tabbassum S, Cheng P, Yanko FM, Balachandran RC, Bowman AB, **Nie LH\*** (2021). Whole Body Potassium as a Biomarker for Potassium Uptake Using a Mouse Model. Nature Scientific Report, 11(1):6385. Doi: 10.1038/s41589-021-85233-2
2. Specht AJ, Zhang X, Young A, Nguyen VT, Christiani DC, Ceballos DM, Allen JG, Weuve J, Nie LH, Weisskopf MG. J Expo Sci Environ Epidemiol. 2021. Doi: 10.1038/s41370-021-00358, Epub ahead of print
3. Zhang X, Specht AJ, Wells E, Weisskopf MG, Weuve J, **Nie LH\*** (2020). Evaluation of a Portable XRF Device for In Vivo Quantification of Lead in Bone among a US population. Science of the Total Environment. E-pub ahead of print, doi: 10.1016/j.scitotenv.2020.142351; PMID: 33207470
4. Tabbassum S, **Nie LH\*** (2020). In Vivo Neutron Activation Assembly Design for Quantification of Trace Elements Using MCNP. Physiological Measurement, E-Pub ahead of print, doi: 10.1088/1361-6579/abc322; PMID: 33080584

5. Byrne P, Coyne M, **Nie LH\***. Improved MCNP Simulation Considering Neutron Angular Distribution and Its Experimental Verification. *International Journal of Atomic and Nuclear Physics*. 5(2020)023, DOI: 10.35840/2631-5017/2521
6. Hasan Z, Rolle-McFarland D, Liu Y, Zhou J, Mostafaei F, Li Y, Fan Q, Zhou Y, Zheng W, **Nie LH\***, Wells EM\*. Characterization of Bone Aluminum, a Potential Biomarker of Cumulative Exposure, within and Occupational Population from Zunyi, China. *Journal of Trace Element in Medicine and Biology*, doi: 10.1016/j.jtemb.2020.126469, Epub on Jan.14, 2020
7. Colicino E, Just A, Kioumourtzoglou MA, Vokonas P, Cardenas A, Sparrow D, Weisskopf M, **Nie LH**, Hu H, Schwartz JD, Wright RO, Baccarelli AA. Blood DNA Methylation Biomarker of Cumulative Lead Exposure in Adults. *J Expo Sci Environ Epidemiol*, doi: 10.1038/s41370-019-0183-9, Epub on Oct.21, 2019
8. Specht AJ, Weisskopf M, **Nie LH\***. Childhood Lead Biokinetics and Associations with Age among a Group of Lead-poisoned Children in China. *J Expo, Sci Environ Epidemiol*. 29(2019)416-423
9. Lin Y, Huang L, Specht AJ, Xu J\*, Yan C, Geng H, Shen X, **Nie LH\***, Hu H (2019). The Association of Bone Lead and Blood Lead with Child Attention-deficit-hyperactivity-disorder-like Behavior. *Sci Total Environ*. 659(2019)161-167
10. Rolle-McFarland D, Liu Y, Zhou J, Mostafaei F, Zhou Y, Li Y, Fan Q, Zheng W, **Nie LH\***, Wells E\*. The Association between Bone, Fingernail, and Blood Manganese with Cognitive and Olfactory Function in Chinese Workers. *Science of Total Environment*. 666(2019) 1003-1010
11. Abel MR, **Nie LH\***. Improving the Sensitivity of Fast Neutron Inelastic Scatter Analysis to Iron Using Associated Particle Collimation. *Nuclear Instruments and Methods in Physics Research, A*. 932(2019)31-42
12. Coyne MD, Lobene A, Neumann C, Lachcik P, Weaver CM, **Nie LH\***. Determination of Bone Sodium (Na) and Na Exchange in Pig Leg using In Vivo Neutron Activation Analysis (IVNAA), *Physiol Meas*. 40(2019)075009, doi: 10.1088/1361-6579/ab2ba5
13. Specht AJ, Zhang X, Goodman BD, Maher E, Weisskopf MG, **Nie LH\***. A Dosimetry Study of Portable X-ray Fluorescence In Vivo Metal Measurements. *Health Physics*. 116(2019)590-598
14. Specht AJ, Kponee K, Nkpaa KW, Balcom PH, Weuve J, **Nie LH**, Weisskopf MG. Validation of X-ray Fluorescence Measurements of Metals in Toenail Clippings against Inductively Coupled Plasma Mass Spectrometry in a Nigerian Population. *Physiol Meas*. 39(2018)085007.
15. Rolle-McFarland D, Liu Y, Zhou J, Mostafaei F, Zhou Y, Li Y, Fan Q, Zheng W, **Nie LH\***, Wells EM\*. 2018. Development of a cumulative exposure index (CEI) for manganese and comparison with bone manganese and other biomarkers of manganese exposure. *International Journal of Environmental Research and Public Health*. 15(2018)1341.
16. Coyne M, Neumann C, Zhang X, Byrne P, Liu Y, Weaver CM, **Nie LH\***. Compact DD generator based In Vivo Neutron Activation Analysis (IVNAA) System to Determine Sodium Concentrations in Human Bone. *Physiological Measurement*. 39(2018)055004. doi: 10.1088/1361-6579/aabe66.
17. Abel MR and **Nie LH\***. Monte Carlo Simulations of Elemental Imaging using the Neutron Associated Particle Technique. *Medical Physics*, 45(2018)1631-1644.



18. Specht AJ, Lin Y, Xu J, Weisskopf M, **Nie LH\***. Bone Lead Levels in an Environmentally Exposed Elderly Population in Shanghai, China. *Science of Total Environment*. 626(2018)96-98
19. Liu Y, Rolle-McFarland D, Mostafaei F, Zhou Y, Li Y, Zheng W, Wells EM\*, **Nie LH\***. *In Vivo* Neutron Activation Analysis (IVNAA) of Bone Manganese (Mn) in Workers, *Physiological Measurement*, 39(2018)035003
20. Specht A, Parish CN, Wallens EK, Watson RT, **Nie LH**, Weisskopf MG. Validation of X-ray Fluorescence Bone Lead Measurements of Condor Bones. *Science of Total Environment*. 615(2018)398-403
21. Zhang X, Specht AJ, Weisskopf MG, Weuve J, **Nie LH\***. Quantification of Manganese and Mercury in Toenail In Vivo Using Portable X-ray Fluorescence (XRF). *Biomarkers*, 23(2018)154-160
22. Wells EM\*, Liu Y, Rolle D, Mostafaei F, Zheng W, **Nie LH\***. In Vivo Measurement of Bone Manganese and Association with Manual Dexterity: a Pilot Study. *Environmental Research*, 160(2018)35-38
23. Specht A, Marc Weisskopf, **Nie LH\***. Theoretical Modelling of a Portable X-ray Tube Based KXRF System to Measure Lead in Bone. *Physiological Measurement*, 38(2017)575-585
24. Specht AJ, Mostafaei F, Lin Y, Xu J, **Nie LH\***. Measurements of Strontium Levels in Human Bone in vivo Using X-ray Fluorescence. *Applied Spectroscopy*, 71(2017)1962-1968
25. Hsieh M, Liu Y, Mostafaei F, Poulson J, **Nie LH\***. A Feasibility Study of a Deuterium-deuterium Neutron Generator-based Boron Neutron Capture Therapy System for Treatment of Brain Tumors. *Medical Physics*, 44(2017)637-643
26. Liu Y, Mostafaei F, Sowers D, Hsieh M, Zheng W, **Nie LH\***. Customized Compact Neutron Activation Analysis System to Quantify Manganese (Mn) in Bone In Vivo. *Physiological Measurement*, 38(2017)452-465
27. Wang Y, Specht A, Liu Y, Finney L, Maxey E, Zheng W, Weisskopf M, **Nie LH\***. Micro-distribution of Lead in Human Teeth Using Synchrotron  $\mu$ -XRF. *X-ray Spectrometry*, 46(2017)19-26
28. Farooqui Z, Bakulski KM, Power MC, Weisskopf MG, Sparrow D, Spiro III A, Vokonas PS, **Nie LH**, Hu H, Park SK. Association of cumulative Pb exposure and longitudinal changes in Mini-Metal Status Exam scores, global cognition and domains of cognition: The VA Normative Aging Study. *Environmental Research*, 152(2017)102-108
29. Abel M, Koltick D, **Nie LH\***. Associated particle neutron elemental imaging in vivo: a feasibility study, *Medical Physics*, 43(2016)5964-5972
30. Mostafaei F, **Nie LH\*** (2016). The study of in vivo x-ray fluorescence (XRF) technique for gadolinium (Gd) measurements in human bone, *Journal of Instrumentation*, E-pub ahead of print, Aug.2, 2016, <http://iopscience.iop.org/1748-0221/11/08/T08001>
31. Byrne P, Mostafaei F, Liu Y, Koltick D, Zheng W, **Nie LH\*** (2016). The Study of In Vivo Quantification of Aluminum (Al) in Human Bone with a Compact DD Generator-based Neutron Activation Analysis (NAA) **System**. *Physiological Measurements*, 37(5): 649-660

32. Specht A, Lin Y, Weisskopf M, Yan C, Hu H, Xu J, **Nie LH\*** (2016). XRF-measured Bone Lead (Pb) as a Biomarker for Pb Exposure and Toxicity Among Children Diagnosed with Pb Poisoning. *Biomarkers*. 21(4): 347-352
33. Sowers D, Liu Y, Mostafaei F, Blake S, **Nie LH\*** (2015). A Dosimetry Study of Deuterium-Deuterium Neutron Generator-Based *in vivo* Neutron Activation Analysis. *Health Physics*, 109: 566-572
34. Mostafaei F, Blake SP, Liu Y, Sowers DA, **Nie LH\*** (2015). Compact DD Generator-based Neutron Activation Analysis (NAA) System to Determine Fluorine in Human Bone *In Vivo*: A Feasibility Study. *Physiological Measurement*, 36: 2057-2067
35. Jhun MA, Hu H, Schwartz J, Weisskopf MG, **Nie LH**, Sparrow D, Vokonas PS, Park SK (2015). Effect Modification by Vitamin D Receptor Genetic Polymorphisms in the Association between Cumulative Lead Exposure and Pulse Pressure: a Longitudinal Study. *Environmental Health*. 14:5-14
36. Bakulski KM, Park SK, Weisskopf MG, Tucker KL, Sparrow D, Spiro A, Vokonas PS, **Nie LH**, Hu H, Weuve J. (2014). Lead Exposure, B Vitamins, and Plasma Homocysteine in Men 55 years of Age and Older: The VA Normative Aging Study. *Environmental Health Perspect*. 22: 1066-1074
37. Specht A, Weisskopf M, **Nie LH\*** (2014). Portable XRF Technology to Quantify Pb in Bone *In Vivo*. *Journal of Biomarkers*. Volume 2014 (2014), Article ID 398032, <http://dx.doi.org/10.1155/2014/398032>
38. Liu Y, Byrne P, Wang H, Koltick D, Zheng W, **Nie LH\*** (2014). A Compact DD Neutron Generator-based NAA System to Quantify Manganese (Mn) in Bone *In Vivo*. *Physiological Measurement*, 35: 1899-1911
39. Freeman JL\*, Weber GJ, Peterson SM, **Nie LH\*** (2014). Embryonic Ionizing Radiation Exposure Results in Expression Alterations of Genes Associated with Cardiovascular and Neurological Development, Function, and Disease and Modified Cardiovascular Function in Zebrafish. *Frontiers in Genetics*, 122: 229-334
40. O'Neal SL, Hong L, Fu S, Jiang W, Jones A, **Nie LH**, Zheng W (2014). Manganese accumulation in bone following chronic exposure in rats: steady-state concentration and half-life in bone. *Toxicol Lett*. 229: 93-100
41. Power MC, Korrnick S, Tchetgen EJ, **Nie LH**, Grodstein F, Hu H, Weuve J, Schwartz J, Weisskopf MG. Lead Exposure Rate of Change in Cognitive Function in Older Women. *Environmental Research*. 129(2014)69-75
42. Eum KD, Weisskopf MG, **Nie LH**, Hu H, Korrnick SA. Cumulative Lead Exposure and Age at Menopause in the Nurses' Health Study Cohort. *Environmental Health Perspect*. 122(2014)229-234
43. Dant JT, Richardson R, **Nie LH\***, Monte Carlo Simulation of Age-dependent Radiation Dose from Alpha- and Beta-emitting Radionuclides to Critical Trabecular Bone and Bone Marrow Targets, *Physics in Medicine and Biology*, 58(2013)3301-3319
44. Koltick D\* and **Nie LH\***, Associated Particle Neutron Imaging for Elemental Imaging in Medical Diagnostics, *IEEE Nuclear Transactions*, 60(2013)824-829
45. Grashow R., Miller MW, McKinney A, **Nie LH**, Sparrow D, Hu H, Weisskopf MG. Lead Exposure and Fear-Potentiated Startle in the VA Normative Aging Study: A Pilot Study of a Novel Physiological Approach to Investigating Neurotoxicant Effects, *Neurotoxicology and Teratology*, 38(2013)21-28
46. Liu Y, Koltick D, Byrne P, Zheng W, and **Nie LH\***. Development of a Transportable

- Neutron Activation Analysis System to Quantify Mn in Bone In Vivo – Feasibility and Methodology, *Physiological Measurement*, 34(2013)1593-1609
47. **Nie LH**, Wright RO, Bellinger D, Hussain J, Amarasiriwardena C, Chettle DR, Pejovic-Milic A, Woolf A, Shannon M\*. Blood Lead Levels and CBLI as Predictors of Late Neurodevelopment in Lead Poisoned Children, *Biomarkers*, 16(2011)517-524
  48. Peters JL, Kubzansky LD, Ikeda A, Spiro III A, Wright RO, Weisskopf MG, Kim D, Sparrow D, **Nie LH**, Hu H, Schwartz J. Childhood and Adult Socioeconomic Position, Cumulative Lead Levels and Pessimism in Later Life: the VA Normative Aging Study. *American Journal of Epidemiology*, Nov.2011, Epub ahead of print
  49. Wilker E, Korrick S, **Nie LH**, Sparrow D, Vokonas P, Coull B, Wright RO, Schwartz J, Hu H. Longitudinal Changes in Bone Lead Levels: the VA Normative Aging Study. *Journal of Environmental and Occupational Monitoring*, 53(2011)850-855
  50. Eum KD, **Nie LH**, Schwartz J, Vokonas PS, Sparrow D, Hu H, Weisskopf MG. Prospective Cohort Study of Lead Exposure and Electrocardiographic Conduction Disturbances in the Department of Veterans Affairs Normative Aging Study. *Environmental Health Perspect*, 119(2011)940-944
  51. **Nie LH**, Sanchez S, Grodzins L, Cleveland R, Weisskopf MG\*. In Vivo Quantification of Lead in Bone with a Portable XRF System – Methodology and Feasibility. *Physics in Medicine and Biology*, 56(2011)N39-51
  52. Behinaein S, Chettle DR, Atanackovic J, Egden LM, Fleming DEB, **Nie LH**, Richard N, Stever S. In Vivo Measurement of Lead in the Bones of Smelter Workers Using the Four-element ‘Clover-leaf’ Geometry Detector System. *Physics in Medicine and Biology*. 56(2011)653-665
  53. Weisskopf MG, Weuve J, **Nie LH**, Saint Hilaire MH, Sudarsky L, Simon DK, Hersh B, Schwartz J, Wright RO, Hu H. Association of Cumulative Lead Exposure with Parkinson’s Disease. *Environ Health Perspect*, 118(2010)1609-1613
  54. Park SK, Elmarsafawy S, Mukherjee B, Spiro III A, Vokonas P, **Nie H**, Weisskopf M, Schwartz J, Hu H. Cumulative Lead Exposure and Age-related Hearing Loss: The VA Normative Aging Study. *Hearing Research*. 269(2010)48-55
  55. Zhang A, Park SK, Wright RO, Weisskopf MG, Mukherjee B, **Nie H**, Sparrow D, Hu H. The HFE H63D Polymorphism as a Modifier of the Impact of Cumulative Lead Exposure on Pulse Pressure: the Normative Aging Study. *Environmental Health Perspective*. 118(2010)1261-1266
  56. Peters JL, Weisskopf MG, Spiro A 3<sup>rd</sup>, Schwartz J, Sparrow D, **Nie H**, Hu H, Wright RO, Wright RJ. Interactions of Stress, Lead Burden, and Age on Cognition in Older Men: the VA Normative Aging Study. *Environ Health Perspectives*. 118(2010)505-510
  57. Park SK, Mukherjee B, Xia X, Sparrow D, Weisskopf MG, **Nie H**, Hu H. Bone Lead Level Prediction Models and Their Application to Examine the Relationship of Lead Exposure and Hypertension in the Third National Health and Nutrition Examination Survey. *J Occup Environ Med*. 51(2009)1422-1436
  58. Arora M, Weuve J, Weisskopf MG, Sparrow D, **Nie H**, Hu H. Cumulative Lead Exposure and Risk of Tooth Loss in Men: the Normative Aging Study. *Environmental Health Perspectives*, 117(2009)1531-1534
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**Peer-reviewed Journal Articles Submitted/ In Preparation** (\* indicates corresponding author(s); trainees in Dr. Nie's lab are underlined)

92. Zhang X, Specht AJ, Ellen Wells, Weisskopf MG\*, Weuve J\*, **Nie LH\***. *In Vivo* Quantification of Strontium (Sr) in Bone Using Portable X-ray Fluorescence (XRF) and Bone Sr among Different Ethnicities. Biomarkers. To be submitted
93. Webb A, Spiers K, Falkenberg G, Gu H, Du Y, Zheng W, **Nie LH\***. Distribution of Lead (Pb) and Selenium (Se) in Mouse Brain Following Subchronic Pb Exposure by Using Synchrotron X-ray Fluorescence. Metallomics, Submitted
94. Balachandran RC, Yanko FM, Cheng P, Rivers CN, Morcillo P, Akinyemi A, Tabbassum S, Pfalzer AC, **Nie LH**, Aschner M, Bowman AB. Rodent Hair is a Poor Biomarker for Internal Exposure Dose of Manganese. Submitted
95. Cheng P, Tabbassum S, Yanko FM, Balachandran RC, Bowman AB, **Nie LH\***. Whole Body Manganese (Mn) as a Biomarker for Mn Exposure Using Rodent Models. Physiological Measurements, In preparation
96. Zhang X, Specht AJ, Weisskopf MG, Weuve J, **Nie LH\***. *In Vivo* Quantification of Manganese and Mercury in Toenail Using Portable X-ray Fluorescence (XRF) among a US Population. Biomarkers. In preparation
97. Tabbassum S, Neumann CR, Coyne M, Zhang X, Byrne P, **Nie LH\***. Investigating Magnesium Content in Hand Bone Utilizing a Portable Deuterium-Deuterium Neutron Generator. Physiological Measurements. In preparation
98. Tabbassum S, Lobene A, Lachcik P, Weaver CM, **Nie LH\***. Determine Sodium Bio-kinetics and Storage in Pig Model by Using In Vivo Neutron Activation Analysis. Physiological Measurements. In preparation
99. Specht AJ, Lin Y, Xu J, Dickerson AS, Yan C, Hu H, Weisskopf M, **Nie LH\***. The Effect of Chelation Bone Pb Stores in Pb Poisoned Children from Shanghai, China. In preparation

**PRESENTATIONS**

- 2020 The Application of Synchrotron X-ray Technology in Human Health, Jan.7, 2020, Indiana University School of Medicine (invited)
- 2020 Noninvasive Quantification of Metals in Human Tissues In Vivo, Dec.10, 2020, Wayne State University (invited)
- 2020 The Application of Synchrotron X-ray Technology in Biology and Human Health, Oct.15, 2020, Purdue University School of Health Sciences, Bowman Lab (invited)

- 2019 The Application of X-ray and Neutron Technologies in Human Health, Dec.19, 2019, POSTECH, Pohang, Korea (invited)
- 2019 Bone Lead (Pb), Blood Pb, and Pb Biokinetics in Pb-poisoned Children, the 13<sup>th</sup> International Society for Trace Element Research in Humans Meeting (ISTERH), Bali, Indonesia, Sep.22-26, 2019 (invited)
- 2019 Bone Lead (Pb), Blood Pb, and Pb Biokinetics in Pb-poisoned Children, Annual Lead Program at Montefiore Medical Center, Albert Einstein College of Medicine, Nov.1, 2019 (invited, presented by Dr. Nie's former trainee Dr. Aaron Specht due to a family emergency)
- 2019 Noninvasive Quantification of Metals and Trace Elements in Human Tissues In Vivo, Indiana University Purdue University Institute, Department of Earth Sciences, Feb.18, 2019, Indianapolis, IN (invited)
- 2018 Noninvasive Quantification of Metals and Trace Elements in Human Tissues In Vivo, Purdue Center for Environment, West Lafayette, IN, May.8, 2018 (invited)
- 2018 Noninvasive Quantification of Metals and Trace Elements in Human Tissues In Vivo, China Institute of Atomic Energy, Nov.29, 2018, Beijing, China (invited)
- 2018 In Vivo Neutron Activation Analysis (IVNAA) to Quantify Metals in Bone, Metals Symposium, Harvard School of Public Health, Boston, June.14-15, 2018 (invited)
- 2017 Customized Compact Neutron Activation Analysis to Quantify Manganese (Mn) and Aluminum (Al) in Bone In Vivo, 56<sup>th</sup> SOT meeting, Baltimore, Mar.12-16, 2017 (invited, and chair for a session)
- 2017 Noninvasive Quantification of Metals in Human Tissues In Vivo, School of Health Sciences, Purdue University, Oct.31, 2017
- 2016 Noninvasive In Vivo Quantification of Metals in Human Tissues, NIEHS 50<sup>th</sup> anniversary FEST, Dec.5-8, 2016 (invited)
- 2016 Noninvasive Quantification of Metals in Human Tissues In Vivo, Department of Statistics, Purdue University, Nov.15, 2016 (invited)
- 2016 Application of Neutron Technologies in Medicine Using Compact DD Neutron Generator, China Institute of Atomic Energy, Jul.4, 2016 (invited)
- 2016 Noninvasive Quantification of Metals in Human Tissues In Vivo, China Institute of Atomic Energy, Jul.5, 2016 (invited)
- 2016 Noninvasive Quantification of Pb and Sr in Human Bone In Vivo Using XRF, Shanghai Center for Disease Control (CDC), Jul.6, 2016 (invited)
- 2015 Noninvasive In Vivo Quantification of Metals in Human Bones, 54<sup>th</sup> SOT meeting, San Diego, California, Mar.22-26, 2015 (invited, and chair for a session)
- 2015 Noninvasive Quantification of Metals in Human Bone In Vivo, 25<sup>th</sup> ISES annual meeting, Henderson, Nevada, Oct.18-22, 2015 (invited)
- 2015 Noninvasive Quantification and Mapping of Metals in Human Tissues In Vivo, University of Illinois NPPE Department, Mar.17, 2015 (invited)
- 2015 A Pilot Study on Mn Exposure and Neurological Effects Using Bone Mn as a Biomarker, PRP symposium, University of Cincinnati, Oct.8-9, 2015 (invited)
- 2015 Non-invasive Quantification of Metals in Human Bone In Vivo, Purdue University College of Human and Health Sciences, seminar for Early Career Achievement Award, Oct.28, 2015 (invited)
- 2014 APNEI Technology for 3-D Noninvasive In Vivo Quantification of Trace Elements in Human Tissue, 24<sup>th</sup> ISES annual meeting, Cincinnati, Ohio, Oct.12-16, 2014

- 2014 A Novel APNEI Technology for 3-D Noninvasive In Vivo Quantification of Trace Elements in Animal and Human Tissue, 53<sup>rd</sup> Annual SOT meeting, Phoenix, Arizona, Mar.23-27, 2014
- 2014 A compact DD neutron generator-based NAA system to quantify manganese (Mn) in bone in vivo, Lead Collaborative Consortium, Hamilton, ON, Canada, Jun. 4-6, 2014, Hamilton, ON (invited, and chair for a session)
- 2014 Application of a D-D based Neutron Generator to Quantify Manganese in Bone *In Vivo*, 23<sup>rd</sup> International Conference on the Application of Accelerators in Research and Industry, May. 25-30, 2014, San Antonio, TX (invited)
- 2013 Development of a Transportable Neutron Activation Analysis System to Quantify Manganese in Bone In Vivo, IEEE NSS/MIC/RTSD meeting, Nov.27-Dec.1, 2013, Seoul, South Korea
- 2013 Development of An Associated Particle Imaging Technology for 3-D Noninvasive In Vivo Elemental Mapping in Human Tissues, SOT annual meeting, San Antonio, TX, Mar.10-14, 2013
- 2012 Noninvasive *In Vivo* Measurement of Pb in Bone with a Portable XRF System, Lead Collaborative Consortium, Hamilton, ON, Canada, Jun.6-8, 2012, Hamilton, ON (invited)
- 2012 Instrumentation Development for Noninvasive *In Vivo* Quantification of Metals, Presented to Landauer Inc., Apr.3, 2012, West Lafayette, IN (invited)
- 2011 Noninvasive In Vivo Quantification of Metals in Human Tissues, Department of Physics, Purdue University, Nov.1, 2011 (invited)
- 2011 Annual HPS meeting, Purdue HP program representative, Jun.26-30, 2011, West Palm Beach, FL
- 2011 Validation of a Portable X-ray Fluorescence (XRF) Technology to Quantify Lead in Bone in vivo, 2011 SOT Annual Meeting, Mar. 6-10, 2011, Washington D.C.
- 2010 Noninvasive In Vivo Quantification of Lead in Bone, Shanghai Institute for Pediatric Research, Xinhua Hospital, Shanghai, China, Dec.30, 2010 (invited)
- 2010 Noninvasive In Vivo Quantification of Metals in Human Tissues, IU School of Medicine, Indianapolis, IN, Jul.7, 2011 (invited)
- 2010 Bone and Blood Lead Levels and CBLI as Predictors of Late Neurodevelopment in Lead Poisoned Children, Lead Collaborative Consortium, Hamilton, ON, Canada, Jun.3-4, 2010 (invited)
- 2010 Noninvasive In Vivo Exposure Assessment of Metals, NIOSH research center seminar, University of Michigan School of Public Health, Ann Arbor, Michigan, Mar.26, 2010 (invited)
- 2010 Bone and Blood Lead Levels as Predictors of Late Neurodevelopment in Lead Poisoned Children, 2010 Pediatric Academic Societies (PAS) Annual Meeting, May.1-4, 2010, Vancouver, Canada
- 2010 Development of a Portable XRF System for In vivo Quantification of Lead (Pb) in Bone, SOT Annual Meeting, Mar.7-11, 2010, Salt Lake City, Utah
- 2009 Trabecular Bone Microdosimetry for <sup>3</sup>H, <sup>14</sup>C, and Selected  $\alpha$ -emitters Incorporated in Bone Remodeling Process, and Three Other Projects, Purdue School of Nuclear Engineering, West Lafayette, IN, Mar.30, 2009 (invited)
- 2009 Development and Application of a New XRF *in vivo* Bone Lead Measurement System, and Three Other Projects in Radiation Dosimetry and Nuclear Instrumentation, Purdue School of Health Sciences, West Lafayette, IN, Feb.24, 2009 (invited)



- 2008 Development and Application of a New X-ray Fluorescence (XRF) System for *in vivo* Bone Lead Measurement, and Three Other Projects, East Carolina University, Greenville, NC, Dec.9, 2008 (invited)
- 2008 Development and Application of a New X-ray Fluorescence (XRF) System for *in vivo* Bone Lead Measurement, and Three Other Projects, University of Michigan, Ann Arbor, MI, Dec.5, 2008 (invited)
- 2008 Trabecular Bone Microdosimetry for  $^3\text{H}$ ,  $^{14}\text{C}$ , and Selected  $\alpha$ -emitters Incorporated in Bone Remodeling Process, Virginia Commonwealth University Medical Center, Richmond, VA, Aug.27, 2008 (invited)
- 2008 Bone Lead and Endogenous Exposure, Lead Collaborative Consortium, Hamilton, ON, Canada, Jun.2-3, 2008 (invited)
- 2008 Trabecular Bone Microdosimetry for  $\alpha$  and  $\beta$  Particles Incorporated in Bone Remodeling Process, McMaster University, Hamilton, ON, Canada, Mar.6, 2008 (invited)
- 2008 Accuracy and Precision of an Advanced *in vivo* K-x Ray Fluorescence (KXRF) Bone Lead Measurement System. 2008 Joint Annual Conference, International Society for Environmental Epidemiology and International Society of Exposure Analysis (ISEE/ISEA). Oct. 12-16, Pasadena, California, USA
- 2007 The Application of X-ray Fluorescence (XRF) and Neutron Activation Analysis (NAA) in *in-vivo* Measurement of Metals, Henry Ford Health System, Detroit, MI, Nov.9, 2007 (invited)
- 2007 Lead Exposure Assessment for Children with an Advanced K X-ray Fluorescence (KXRF) Bone Lead Measurement System, University of Michigan School of Public Health, Ann Arbor, MI, Nov.7, 2007 (invited)
- 2007 Bone Lead and Endogenous Exposure among an Environmentally Exposed Elderly Population: the Normative Aging Study, The 17<sup>th</sup> Annual Conference of International Society of Exposure Analysis (ISEA), Oct.14-18, 2007, Durham, NC, USA
- 2006 Lead Exposure Assessment for Children with a State-of-Art K X-ray Fluorescence (KXRF) Bone Lead Measurement System, Children's Hospital, Boston, MA, May.19, 2006 (invited)
- 2005 The Study of a New X-ray Fluorescence (XRF) System for the *in vivo* Bone Lead Measurement, Harvard School of Public Health, Boston, MA, Apr.5, 2005 (invited)
- 2005 The Study of a New X-ray Fluorescence (XRF) System for the *in vivo* Bone Lead Measurement, Hamilton Regional Cancer Center, Hamilton, ON, Canada, Mar.23, 2005 (invited)
- 2005 Dosimetry Study for a New *in-vivo* X-ray fluorescence (XRF) Bone Lead Measurement System, The 6<sup>th</sup> Industrial Radiation and Radioisotope Measurement Applications (IRRMA-VI), Jun.20-24, 2005, Hamilton, Canada
- 2004 Development of an X-ray Fluorescence (XRF) System for the *in vivo* Bone Lead Measurement, University of Western Ontario, London, ON, Canada, Jul.6, 2004 (invited)
- 2004 X-ray Fluorescence Data in the Study of Human Bone Lead Metabolism, The European Conference on X-ray Spectrometry (EXRS) June 6-11, 2004, Alghero, Italy
- 2002 Improvement for the *in vivo* Measurement of Lead in Bone, The 5<sup>th</sup> International Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications (IRRMA-V), Jun.9-14, 2002, Bologna, Italy
- 1999 Study on Air Pollution in Beijing's Major Industrial Areas Using Multielements in Biomonitors and NAA Techniques, Utilization of the Research Reactor, Feb. 1999,

Yogyakarta, Indonesia

1998 Preliminary Study on Relationship between Osteoporosis and Trace Elements with Rat Models, The 6<sup>th</sup> Nuclear Analytical Methods in Life Sciences (NAMLS-6), Oct.26-30, 1998, Beijing, China

### **Abstracts (Selected)**

1. Webb A, Spiers K, Falkenberg G, Gu H, Du Y, Zheng W, **Nie LH\***. Lead (Pb) and Selenium (Se) Deposition in Brain of Pb Exposed Mice Using Synchrotron X-ray Fluorescence. Abstract published and work presented in the annual American Association of Physicist in Medicine (AAPM) meeting, July 12-16, 2020; Virtual meeting
2. Tabbassum S, **Nie LH\***. In Vivo Measurement of Potassium in Mice Using Neutron Activation Analysis. Abstract published and work presented in the annual American Association of Physicist in Medicine (AAPM) meeting, July 12-16, 2020; Virtual meeting
3. Tabbassum S, **Nie LH\***. A Comparative Study to Optimize the In-vivo Neutron Activation Analysis System. Abstract published and work presented in the annual American Association of Physicist in Medicine (AAPM) meeting, July 14-18, 2019, San Antonio, TX
4. Coyne M, Lobene A, Lachcik P, Weaver CM, **Nie LH\***. Developing Compact Deuterium-deuterium (DD) Generator based In Vivo Neutron Activation Analysis (IVNAA) as a New Method for Measuring Sodium (Na) in Bone and Soft Tissue. Abstract published and work presented in the annual Health Physics Society (HPS) meeting, July 7-14, 2019, Orlando, Florida
5. Coyne M, **Nie LH\***. A New Way to Measure Sodium. Work presented in the annual ORVC meeting, March 15-16, Louisville, KY
6. **Nie LH\***, Specht A, Lin Yanfen, Weisskopf M, Yan C, Hu H, Xu J\*. Bone Lead (Pb), Blood Pb, and Pb Biokinetics in Pb-poisoned Children. Abstract published and work presented in the 13<sup>th</sup> International Society on Trace Element Research in Humans (ISTERH) meeting, Sep. 22-26, 2019, Bali, Indonesia
7. Coyne M, Neumann C, Zhang X, Byrne P, Lobene A, Lachcik P, Weaver CM, **Nie LH\***. Quantification of Sodium (Na) in Bone with *In Vivo* Neutron Activation Analysis (IVNAA) and Its Implications on Na Retention Studies. Metals Study Symposium, June. 14-15, 2018, Boston MA
8. Neumann C, Coyne M, Zhang X, Byrne P, **Nie LH\***. Quantification of Manganese in Bone using In Vivo Neutron Activation Analysis (IVNAA). Metals Study Symposium, June.14-15, 2018, Boston, MA
9. Zhang X, Specht AJ, Weisskopf MG, Weuve J, **Nie LH\***. Quantification of Bone Lead and Toenail Manganese and Mercury In Vivo with X-ray Fluorescence Technology. Metals Study Symposium, June.14-15, 2018, Boston MA
10. **Nie LH\***, Liu Y, Rolle-McFarland D, Mostafaei F, Zhou Y, Li Y, Zheng W, Wells E. In Vivo Neutron Activation Analysis of Bone Manganese (MnBn) in Workers. Metals Study Symposium. June. 14-15, 2018, Boston MA
11. Abel MR, **Nie LH\***. Monte Carlo Simulation of Elemental Imaging Using Neutron Associated Particle Technique. Annual HPS meeting, Jul.15-19, 2018, Cleveland, OH
12. Hasan Z, Rolle-McFarland DR, Liu Y, Mostafaei F, Zheng W, **Nie LH**, Wells E. The Association between Olfactory and Cognitive Function Tests with Aluminum Biomarkers

- in an Occupationally Exposed Population from China. ISEE annual meeting, Aug.26-30, 2018, Ottawa, Canada
13. Zhang X, Specht AJ, Weisskopf MG, Weuve J, **Nie LH\***. Quantification of Bone Lead and Toenail Manganese and Mercury In Vivo with X-ray Fluorescence Technology. ERC UofChicago Center PPRT meeting, Mar. 8-9, 2018, Chicago, IL
  14. Rolle-McFarland D, Liu Y, Mostafaei F, Zheng W, **Nie LH**, Wells E. Association between Blood, Nail, and Bone Manganese with Motor Function among Chinese Workers. SOT annual meeting, Mar.11-15, 2018, San Antonio, TX
  15. **Nie LH\***, Liu Y, Byrne P, Mostafaei F, Rolle D, Hsieh M, Zheng W, Wells E. Customized Compact Neutron Activation Analysis System to Quantify Manganese (Mn) and Aluminum (Al) in Bone *In Vivo*. Abstract published for the 2017 Annual SOT meeting, Mar.12-16, 2017 (chairing one session), Baltimore, MD
  16. Abel M, **Nie LH\*** (2017). Development of a Novel In Vivo Associated Particle Neutron Elemental Imaging (APNEI) System for Noninvasive Medical Diagnosis. Abstract published for the 2017 AAPM Annual Meeting. Jul.30-Aug.3, 2017, Nashville, TN
  17. Coyne M, Lobene A, Joo M, Neumann C, Lachcik P, Weaver C, **Nie LH\*** (2017). Determination of Bone Sodium (Na) and Na Exchange in Pig Leg Using *In Vivo* Neutron Activation Analysis (IVNAA). Abstract published for the AAPM Annual Meeting. Jul.30-Aug.3, 2017, Nashville, TN (NRC travel subsidy to Coyne)
  18. Abel M, **Nie LH\*** (2017). Development of a Novel In Vivo Associated Particle Neutron Elemental Imaging (APNEI) System for Noninvasive Medical Diagnosis. Abstract published for the 2017 annual Health Physics Society (HPS) meeting, Jul.9-13, 2017; Raleigh, NC (NRC travel subsidy to Abel)
  19. Coyne M, Lobene A, Joo M, Neumann C, Lachcik P, Weaver C, **Nie LH\*** (2017). Determination of Bone Sodium (Na) and Na Exchange in Pig Leg Using In Vivo Neutron Activation Analysis (IVNAA). Abstract published for the 2017 annual HPS meeting, Jul.9-13, 2017; Raleigh, NC (HPS travel award to Coyne)
  20. Zhang X, Specht AJ, Weisskopf M, Weuve J, **Nie LH\*** (2017). Feasibility of Quantifying the Manganese and Mercury in Toenail In Vivo with Portable X-ray Fluorescence Technology. Abstract published for the 2017 Annual HPS meeting, Jul.9-13, 2017; Raleigh, NC (HPS travel award to Zhang)
  21. Specht AJ, Lin Y, Weisskopf MG, Yan C, Hu H, Xu J, **Nie LH\***. XRF-measured Bone Lead (Pb) as a Biomarker for Pb Exposure and Toxicity Among Children Diagnosed with Pb Poisoning, 55<sup>th</sup> SOT annual meeting, Mar.13-17, 2016, New Orleans, Louisiana (*SOT Travel Award to Specht*)
  22. Liu Y, Mostafaei F, Rolle D, Zheng W, Wells E, **Nie LH\***. Bone Manganese (Mn) as a Potential Biomarker for Manganese Exposure – An In vivo Pilot Study. 55<sup>th</sup> SOT annual meeting, Mar.13-17, 2016, New Orleans, Louisiana
  23. Hsieh M, Liu Y, and **Nie LH\***. Design of a Beam Shaping Assembly of a Compact DD-Based BNCT System. Abstract accepted for the 58<sup>th</sup> AAPM annual meeting, Jul.31-Aug.4, 2016, Washington DC
  24. Mostafaei F and **Nie LH\***. Improvement in an in vivo K X-ray Fluorescence (KXRF) Technique for Gadolinium Measurement in Human Bone. Abstract accepted for an oral presentation at the 58<sup>th</sup> AAPM annual meeting, Jul.31-Aug.4, 2016, Washington DC

25. Coyne M, Liu Y, Zhang X, **Nie LH\***. Compact DD Generator Based In Vivo Neutron Activation Analysis (IVNAA) System to Determine Sodium and Calcium Concentrations in Human Bone. Abstract accepted and project presented at the 61<sup>st</sup> HPS annual meeting, Jul.17-21, 2016, Spokane, WA (*HPS Travel Award to Coyne*)
26. Rolle D, Liu Y, Mostafaei F, Zheng W, Zhou Y, **Nie LH**, and Wells EM. Bone Manganese (BnMn) as a Biomarker of Cumulative Mn Exposure and Indicator of Neurological Deficit: A Pilot Study. Abstract accepted for the 28<sup>th</sup> ISEE meeting, Sep.1-4, 2016, Rome, Italy
27. Hsieh M, Liu Y, **Nie LH\*** (2016). A D-D based neutron generator system for boron neutron capture therapy: a feasibility study. 17<sup>th</sup> International Congress on Neutron Capture Therapy (ICNCT-17), Oct.2-7. Columbia, Missouri. Abstract book, page77
28. Rolle D, Liu Y, Mostafaei F, Zhou Y, Zheng W, **Nie LH**, Wells EM (2016). Bone manganese (Mn) as a biomarker of occupational Mn exposure. MANGANESE Conference, Sep.25-28. NYC
29. Liu Y, Mostafaei F, Rolle D, Zheng W, Wells E, **Nie LH\*** (2016). Customized portable neutron activation analysis system to quantify manganese (Mn) in bone in vivo. 24<sup>th</sup> International Conference on the Application of Accelerators in Research and Industry (CARRI), Oct.30-Nov.4. Fort Worth, Texas. Abstract #285
30. **Nie LH**. Non-invasive in vivo quantification of metals in human tissue. NIEHS FEST. Dec.5-8, 2016; Raleigh, NC
31. Sowers D, Liu Y, Mostafaei F, Blake S, **Nie LH\***. Deuterium-Deuterium Neutron Generator for Neutron Activation Analysis In Vivo: A Dosimetry Study. Abstract accepted and project presented at the 2015 HPS annual meeting, Jul.12-16, Indianapolis, IN
32. Hsieh M, Liu Y, **Nie LH\***. A D-D Based Neutron Generator System for Boron Neutron Capture Therapy: A Feasibility Study. Abstract accepted and project presented at the 2015 AAPM annual meeting, Jul.12-16, Anaheim, CA (*PGSG Travel Award To Hsieh*)
33. **Nie LH**. Noninvasive Quantification of Metals in Human Tissues In Vivo. 2015 ISES annual meeting (Invited speaker), Oct. 18-22, Henderson, NV
34. **Nie LH**. Noninvasive Quantification of Metals in Human Bone In Vivo. 2015 SOT annual meeting (Invited speaker and Chair for the symposium), Mar.22-26, San Diego, CA
35. **Nie LH\***, Liu Y, Mostafaei F, Rolle D, Zheng W, Wells E. A Pilot Study on Mn Exposure and Neurological Effects Using Bone Mn as a Biomarker. Abstract accepted and project presented at the 2015 University of Cincinnati PRP symposium (Invited Speaker), Oct. 8-9, Cincinnati, OH
36. Specht A, Weisskopf M, **Nie LH\***. Calibration and improvement of a portable XRF technology to quantify lead in bone in vivo. ISES annual meeting, Cincinnati, Ohio, Oct.12-16, 2014
37. Liu Y, Byrne P, Wang H, Koltick D, Zheng W, **Nie LH\***. A Novel Transportable Neutron Activation Analysis System to Quantify Manganese in Bone *In Vivo*. ISES annual meeting, Cincinnati, Ohio, Oct.12-16, 2014
38. **Nie LH\***, Koltick D. A Novel Associated Particle Neutron Elemental Imaging (APNEI) Technology for 3-D Noninvasive *In Vivo* Quantification of Trace Elements in Animal and Human Tissue. ISES annual meeting, Cincinnati, Ohio, Oct.12-16, 2014

39. **Nie LH\***, Liu Y, Koltick D, Zheng W. Application of a D-D based Neutron Generator System to Quantify Manganese in Bone *In Vivo*. CARRI annual meeting, San Antonio, Texas, May 25-30, 2014
40. Liu Y, Koltick D, Zheng W, **Nie LH\***. Development of a transportable neutron activation analysis system to quantify manganese in bone *in vivo* – system setup and validation. 2014 Purdue Sigma Xi poster competition, Feb.12, 2014 (First place winner for Physical Section for Liu)
41. Specht A, Weisskopf M, **Nie LH\***. Calibration and improvement of a portable XRF technology to quantify lead in bone *in vivo*. SOT 2014 annual meeting, Phoenix, Arizona, Mar. 23-27, 2014. Abstract #1552.
42. Liu Y, Koltick D, Zheng W, **Nie LH\***. Development of a transportable neutron activation analysis system to quantify manganese in bone *in vivo* – system setup and validation. 52<sup>th</sup> SOT annual meeting, Phoenix, Arizona, Mar. 23-27, 2014. Abstract #1291. (*SOT Travel Award to Liu*)
43. **Nie LH\***, Koltick D. A novel associated particle neutron elemental imaging (APNEI) technology for 3-D noninvasive *in vivo* quantification of trace elements in animal and human tissue. SOT 2014 annual meeting, Phoenix, Arizona, Mar. 23-27, 2014. Abstract #1287.
44. Liu Y, Koltick DS, Byrne P, Zheng W, **Nie LH\*** (2013). Development of a transportable neutron activation analysis system to quantify manganese in bone *in vivo* – Feasibility and methodology. SOT annual meeting, Mar.10-14, San Antonio, TX. Abstract #1179.
45. Specht A, Weisskopf MG, **Nie LH\***. Portable XRF technology to quantify lead and strontium in bone *in vivo* – calibration and validation. 2013 SOT meeting, Mar.10-14, San Antonio, TX. Abstract #1510.
46. **Nie LH\***, Liu Y, Koltick D, Byrne P, Zheng W. Transportable neutron activation analysis system to quantify manganese in bone *in vivo*. 2013 IEEE NSS/MIC/RTSD meeting, Oct.27-Nov.2, Seoul, South Korea. Abstract #NP02-49.
47. Hong L, O’Neal S, **Nie LH**, and Zheng W (2013). Bone manganese (Mn) concentrations in Sprague–Dawley rats following subchronic manganese exposure. 2013 SOT meeting, Mar.10-14, San Antonio, TX. Abstract #1864.
48. Eum KD, Park SK, **Nie LH**, Vokonas PS, Sparrow D, Hu H, and Weisskopf MG. Cumulative lead exposure, HFE polymorphism and QTc and QRSc intervals. Joint Conference on Environment and Health. Aug. 19-23, 2013. Basel, Switzerland. Abstract #5144.
49. Huang SY, Weisskopf MG, Mukherjee B, Weuve J, **Nie LH**, Saint-Hilaire MH, Sudarsky L, Simon DK, Hersh B, Schwartz JD, Hu H. The potential influence of variants of the SNCA gene on the impact of cumulative lead exposure on risk of Parkinson’s disease. Joint Conference on Environment and Health. Aug. 19-23, 2013. Basel, Switzerland. Abstract #4412.
50. Bakulski K, Park SK, Weisskopf MG, Tucker KL, Sparrow D, Spiro A III, Vokonas PS, **Nie LH**, Hu H, Weuve J. Lead exposure, B-vitamins, and plasma homocysteine in older men. Joint Conference on Environment and Health. Aug. 19-23, 2013. Basel, Switzerland. Abstract #5275.
51. Jhun MA, Hu H, Schwartz JD, Weisskopf MG, **Nie LH**, Sparrow D, Vokonas PS, Park SK. Effect modification by vitamin D receptor genetic polymorphisms in the association between lead and pulse pressure. Joint Conference on Environment and Health. Aug. 19-

- 23, 2013. Basel, Switzerland. Abstract #5243.
52. Farooqui Z, Bakulski K, Cassano PA, Spiro A III, Sparrow D, Vokonas PS, **Nie LH**, Weisskopf MG, Hu H, Park SK. Effect modifications by MTHFR polymorphisms of the association between cumulative lead exposure and mini metal status exam score in older men. Joint Conference on Environment and Health. Aug. 19-23, 2013. Basel, Switzerland. Abstract #5272.
  53. Liu Y, Koltick D, Zheng W, and **Nie LH\***. Development of a Transportable Neutron Activation Analysis (IVNAA) System for Noninvasive Quantification of Mn in Bone *In Vivo* – Feasibility and Methodology. 12<sup>th</sup> Annual Pilot Research Project (PRP) Symposium, Oct.4-5, 2012, University of Cincinnati, Cincinnati, OH.
  54. Liu Y, Koltick D, Byrne P, Zheng W, and **Nie LH\***. Development of a Transportable Neutron Activation Analysis System to Quantify Mn in Bone *In Vivo* – Feasibility and Methodology. 57<sup>th</sup> HPS Annual Meeting, Jul.22-26, 2012, Sacramento, CA. Abstract #THAM-C.1.
  55. Dant JT, Richardson RB, and **Nie LH\***. Alpha and Beta Emitters Dose to Bone and Marrow Using a Dynamic Trabecular Bone Model for All Ages, 57<sup>th</sup> HPS Annual Meeting, Jul.22-26, 2012, Sacramento, CA. Abstract #P.42.
  56. Eum KD, Weisskopf MG, **Nie LH**, Hu H, Korrick SA. Bone Lead Level and Age at Menopause. 24<sup>th</sup> Conference of the International Society for Environmental Epidemiology (ISEE). Aug.26-30, 2012. Columbia, South Carolina
  57. Silver MK, Wright RO, Mukherjee B, **Nie LH**, Sparrow D, Vokonas P, Schwartz J, Hu H, Park SK. Iron Metabolism Genes and Body Burden of Lead: a Pathway Analysis. 24<sup>th</sup> ISEE meeting. Aug.26-30, 2012. Columbia, South Carolina
  58. Koltick DS, **Nie LH**. Associated Particle Neutron Imaging for Elemental Analysis in Medical Diagnostics. 2012 IEEE Symposium on Radiation Measurements and Applications (SORMA), May 14-17, Oakland, California
  59. Freeman JL, Funk A, Peterson S, Weber G, **Nie LH**. Genetic Alteration and Functional Consequences of Embryonic Ionizing Radiation Exposure in Zebrafish. 2012 Society of Toxicology (SOT) Annual Meeting
  60. Sanchez S, Weisskopf MG, **Nie LH**. Validation of a portable x-ray fluorescence (XRF) technology to quantify lead in bone *in vivo*, 50<sup>th</sup> Annual Meeting of Society of Toxicology, Mar.6-10, 2011, Washington DC
  61. **Nie H**, Wright R, Bellinger D, Hussain J, Amarasiriwardena C, Chettle DR, Pejovic-Milic A, Woolf A, Shannon M. Persistency of Lead in Bone and Neurodevelopmental Outcomes for Children with Elevated Lead Exposure at Younger Age. Pediatric Academic Societies' 2010 Annual Meeting, May. 1-4, 2010, Vancouver, BC, Canada
  62. **Nie H**, Grodzins L, Cleveland R, Weisskopf M. Feasibility and Methodology of the Development of a Portable *In Vivo* X-ray Fluorescence (XRF) Bone Lead Measurement System. 49<sup>th</sup> Annual Meeting of Society of Toxicology, Mar. 7-1, 2010, Salt Lake City, Utah
  63. **Nie H**, Parsons P, Bellis D, Todd AC, Chettle DR, Wright R. Accuracy and Precision of an Advanced K-x Ray Fluorescence (KXRF) *in vivo* Bone Lead Measurement System, *Epidemiology*. 19(6) Suppl: S304, November 2008
  64. **Nie H**, Oliveira S, Amarasiriwardena C, Hu H, Chettle DR. The Analysis and Intercalibration of Bone Lead Data Generated by Updated *in vivo* K-x-ray Fluorescence (KXRF) Instruments. Abstract. International Society for Environmental Epidemiology

- annual meeting, Paris, France, Sept. 2-6, 2006. *Epidemiology*. 17(6) Suppl:S463, November 2006
65. Eum KD, **Nie LH**, Schwartz J, Vokonas P, Sparrow D, Hu H, Weisskopf M. Prospective study of lead exposure and electrocardiographic conduction disturbances in the department of veterans affairs Normative Aging Study. 22<sup>nd</sup> annual ISEE meeting, Aug.28 – Sep.1, 2010, Seoul, Korea.
  66. Bakulski K, Park SK, Mukherjee B, Wright RO, Weisskopf MG, Sparrow D, Spiro A III, **Nie H**, Hu H. Lead exposure, iron metabolism polymorphisms, and psychiatric symptoms in the Normative Aging Study, 21<sup>st</sup> annual ISEE meeting, Aug. 25-29, 2009, Dublin, Ireland. Abstract #834.
  67. Zhang A, Park SK, Wright R, Mukherjee B, Sparrow D, Vokonas P, **Nie H**, Hu H. The H63D mutation in the hemochromatosis (HFE) gene modifies the impact of bone lead (Pb) burden on pulse pressure (PP): the VA Normative Aging Study. 21<sup>st</sup> annual ISEE meeting, Aug. 25-29, 2009, Dublin, Ireland. Abstract #136.
  68. Manish A, Weuve J, Weisskopf MG, Sparrow D, **Nie H**, Garcia R, Hu H. Cumulative lead exposure and the risk of tooth loss in men: the Normative Aging Study. 21<sup>st</sup> annual ISEE meeting, Aug. 25-29, 2009, Dublin, Ireland. Abstract # 128.
  69. **Nie H\***, Parsons P, Bellis D, Todd AC, Chettle DR, and Wright R. Accuracy and Precision of an Advanced K-x Ray Fluorescence (KXRF) *in vivo* Bone Lead Measurement System. ISEE/ISEA Joint Annual Meeting, Oct. 12-16, 2008, Pasadena, California. Abstract #1458
  70. Peters JL, Wright RJ, Weisskopf MG, Spiro A III, Schwartz J, Sparrow D, **Nie H**, Hu H, Wright RO. Interaction of stress and lead burden on cognition in older men: the VA Normative Aging Study. ISEE/ISEA Annual Meeting, Oct. 12-16, 2008, Pasadena, California. Abstract #806
  71. Xia X, Park SK, Mukherjee B, Weisskopf M, **Nie H**, Sparrow D, Hu H. Development of prediction models for bone lead levels in a community-based population. ISEE/ISEA Joint Annual Meeting, Oct. 12-16, 2008, Pasadena, California. Abstract #1214
  72. Weisskopf MG, Weuve J, **Nie H**, Saint-Hilaire M, Sudarsky L, Simon DK, Hersh B, Schwartz J, Wright RO, Feldman RG, Hu H. Cumulative exposure to lead and risk of Parkinson's disease. ISEE/ISEA Joint Annual Meeting, Oct. 12-16, 2008, Pasadena, California. Abstract #1591
  73. **Nie H\***, Sanchez B, Hu H. Bone lead and endogenous exposure among an environmentally exposed elderly population: the Normative Aging Study. 17<sup>th</sup> annual ISEA meeting, Oct. 14-18, 2007, Durham, NC. Abstract #370.
  74. Weuve J, Tucker K, Peters J, **Nie H**, Spiro A III, Hu H. Lead Exposure and Plasma Homocysteine in Older Men: A Mechanism of Neurotoxicity and Vascular Toxicity? *Epidemiology*. 18(5) Suppl: S176, September 2007
  75. Weisskopf MG, Jain N, Nie H, Sparrow D, Schwartz J, Hu H. Bone lead and death from all causes, cardiovascular diseases, and cancer: the Normative Aging Study. ISEE annual meeting, Sep.5-9, 2007, Mexico City, Mexico. Abstract #638.
  76. **Nie H\***, Oliveira S, Amarasiriwardena C, Hu H, and Chettle DR. The Analysis and Intercalibration of Bone Lead Data Generated by Updated *in vivo* K-x-ray Fluorescence (KXRF) Instruments. ISEE annual meeting, Sep. 2-6, 2006, Paris, France. Abstract #463
  77. Weuve J, Korrick S, Schwartz J, **Nie H**, Grodstein F, Hu H. Low-Level Exposure to Lead and Cognition Among Older Women. International Society for Environmental Epidemiology annual meeting, Paris, France, Sept. 2-6, 2006. *Epidemiology*. 17(6)

Suppl:S124-S125, November 2006

## GRANTS

### Ongoing:

1. 7/1/2017–6/30/2022, NIH/NIEHS-1R01ES027078, Co-I (PI: Zheng), *Lead Exposure on Beta-Amyloid Transport by Brain Barriers*. \$2,230,934; \$321,808 to Dr. Nie's lab for years 2019-2022

To study how Pb exposure alters brain barrier structure and function, leading to increased permeability of Ab transport to brain, decreased clearance from brain and enhanced aggregation. I am responsible for the measurement of Pb in bone using KXRF bone Pb measurement system and for the Pb concentration mapping in rat brain tissues using synchrotron  $\mu$ -XRF technology.

2. 07/01/2018-06/30/2023, NIH/NHLBI-1R01HL1408488, Site-PI for Purdue Subcontract (PI: Cheryl Anderson), Sodium Regulation in Individuals on Known Dietary Sodium Intake. \$427,916 to Purdue.

To study sodium regulation using novel technologies for bone and soft tissue sodium quantification.

3. 09/01/2019-04/30/2022, Purdue R01 Bridge Funding, PI, In Vivo Neutron Activation Analysis (IVNAA) to Study Sodium (Na) Intake, Na and Potassium (K) Storage, and Blood Pressure Using a Swine Model. \$80,000

To study soft tissue sodium, bone sodium, and the relation with sodium and potassium regulation in pigs with high and low-Na intake.

### Completed Research Support

4. 08/01/2018-07/31/2019, Purdue Research Foundation Fellowship, PI, Portable X-ray Fluorescence (XRF) to Study Strontium and Bone Health. \$20,000.

To develop and validate a portable XRF system to quantify strontium (Sr) in vivo and to assess the correlation between bone Sr and bone health.

5. 5/1/2015–4/30/2021, NIH/NIEHS-1R01ES024165, site-PI for Purdue Subcontract (PI: Weisskopf), *Early and Late-life Metal Exposure and Alzheimer's Disease*. \$245,337 to Purdue.

To investigate the association between AD and metal exposure among an elderly US population. I am responsible for the metal exposure assessment using XRF technologies.

6. 08/1/2016-07/31/2020. NIH/NIEHS-1R21/R21S ES024700, multi-PI (Nie, Weisskopf, Weuve (contact)), *Validation of Portable XRF for In-vivo Measurement of Heavy Metal Exposures*. \$712,183 for R21 and R21S. To validate the portable XRF technique for the *in vivo* quantification of Pb in bone, and of Hg and Mn in toenail against existing gold standard approaches.

7. 08/01/2019-07/31/2020, Purdue Bilsland Fellowship, PI, Validation of a Portable XRF Technology for Noninvasive In Vivo Quantification of Pb in Bone and As in Skin Among a Population Living in Pb- and As- contaminated Superfund Site. \$20,000.



To support one PhD student for research for one year.

8. 08/01/2018 – 07/31/2020. IMnL. Co-I (PI: Bowman). Hair Manganese Accumulation as a Novel Biomarker for External Mn Exposure. Total \$14,500 with \$2,334 to Nie Lab.

9. 07/01/2018 – 06/30/2019. Purdue Travel Grant/ HHS and HSCI International Travel Grant. PI. \$1,600. To visit China for international research collaborations.

10. 7/1/2017-6/30/2018, NIOSH-funded ERC Pilot Research Grant at University of Michigan, PI

*Portable XRF Technology for Noninvasive In Vivo Quantification of Uranium (U) in Bone and Arsenic (As) in Skin among a Population with High U- and As- Exposures.* \$20,000

To develop and validate a portable XRF system to quantify bone U and skin As noninvasively in vivo.

11. 8/1/2014–7/31/2018, NRC-HQ-84-14-G-0039, PI (Fentiman, Nie), *Nuclear Engineering and Health Physics Fellowship Program at Purdue University.* \$391,620

To sponsor graduate students in the field of Nuclear Engineering and Health Physics. I am the PI on the Health Physics side.

12. 7/1/2016-6/30/2017. Purdue University College of Health and Human Sciences International Travel Grant. PI. \$1,600

To support travel to China to visit three institutions to discuss existing and potential research collaborations.

13. 7/1/2014–6/30/2017, CDC/NIOSH-1R21OH010700, PI, *Bone Manganese as a Biomarker for Early Diagnosis of Manganese Neurotoxicity in Occupationally Exposed Workers.* \$401,478.

To test whether bone manganese (Mn) is a good biomarker for cumulative Mn exposure and for early diagnosis of Mn Neurotoxicity. One year no cost extension.

14. 9/1/2016-08/31/2017. Purdue Major Scientific Equipment Award. PI. *Major Scientific Equipment Award from Purdue Vice President of Research Office.* \$150,000.

To purchase an HPGe  $\gamma$ -ray detection system.

15. 8/1/2014-7/31/2017, NRC-HQ-84-14-G-0048, PI (Beans, Garner, Nie), *NRC Faculty Development Grant at Purdue University.* \$580,000

To support junior faculty member to establish their independent laboratory and research. I am the PI for the Health Physics side.

16. 5/17/2016-5/16/2017. Indiana CTSI Project Development Team (PDT). PI. *Bone Sodium and Calcium as Biomarkers to Study Sodium and Calcium Metabolism and Retention.* \$10,000.

To develop novel technology to accurately measure Na and Ca in bone and use them as biomarkers to study hypertension and osteoporosis related to Na and Ca metabolism.

17. 8/1/2014–07/31/2016, NRC-HQ-84-14-G-0017, PI (Fentiman, Nie), *Nuclear Engineering and Health Physics Scholarship Program at Purdue University*. \$194,400  
To sponsor undergraduate students in the field of Nuclear Engineering and Health Physics.
18. 6/1/2015-5/1/2016, Purdue University Instructional Equipment Program, PI, *Instructional Equipment Request to Sustain the Radiological Health Sciences (RHS) Program*. \$7,800.  
To purchase equipment for education of students in RHS program.
19. 7/1/2014-10/1/2015, Purdue University Research Equipment Grant, PI, *Purdue University Laboratory and University Core Facility Research Equipment Program*. \$100,000.  
To purchase a compact deuterium-deuterium neutron generator.
20. 9/1/2013-8/31/2014, Purdue Research Foundation Fellowship. PI. *Development and Validation of a Transportable Neutron Activation Analysis System to Quantify Metals in Bone*. \$17,556  
To develop and validate a novel NAA system to quantify metals in bone in vivo.
21. 7/18/2013-7/17/2015, Purdue University Vice President of Research Office. PI. *Purdue US-China Eco Partnership Travel Grant*. \$4,500  
To travel to China to establish research collaborations.
22. 7/1/2012–6/30/2015, CDC/NIOSH-1R21OH010044 , PI, *Development and Validation of a Novel In Vivo Neutron Activation Analysis Technology for Noninvasive Quantification of Manganese in Bone*, \$338,015  
To develop and validate a transportable neutron activation analysis system to quantify Mn in bone *in vivo*.
23. 8/1/2011–7/31/2014, NRC-HQ-11-G-38-0006, PI (Hassanein, Nie), *NRC Faculty Development Grant at Purdue University*. \$300,000  
To support junior faculty member to establish their independent laboratory and research. I am the PI on the Health Physics side.
24. 8/1/2010–7/31/2014, NRC-HQ-38-09-921, PI (Fentiman, Nie), *Nuclear Engineering and Health Physics Fellowship Program at Purdue University*. \$397,056  
To sponsor graduate students in the field of Nuclear Engineering and Health Physics. I am the PI on the Health Physics side.
25. 8/1/2012–7/31/2014, NRC-HQ-38-10-955, PI (Fentiman, Nie), *Nuclear Engineering and Health Physics Scholarship Program at Purdue University*. \$194,400  
To sponsor undergraduate students in the field of Nuclear Engineering and Health Physics. I am the PI on the Health Physics side.
26. 7/1/2014-6/30/2015, NIOSH-funded ERC Pilot Research Grant at University of Cincinnati. PI (Nie, Liu). *Validation of Neutron Activation Analysis (NAA) System to Quantify Manganese In Vivo*. \$7,600  
To develop a novel IVNAA system to quantify Mn in bone in vivo.

27. 7/1/2013–6/30/2014, NIOSH-funded ERC Pilot Research Grant at University of Michigan, PI (Nie, Byrne). *Development and Validation of a Neutron Activation Analysis System to Quantify Aluminum in Human Bone In Vivo*. \$17,250  
To develop and validate a compact neutron activation analysis system to quantify bone Al noninvasively in vivo.
28. 7/1/2011–6/30/2012, NIOSH-funded ERC Pilot Research Grant at University of Cincinnati, PI, *Design of Novel In Vivo Neutron Activation Analysis System for Noninvasive Quantification of Mn in Bone With Monte Carlo Simulations*. \$11,665  
To design an IVNAA system for bone Mn analysis using MC simulations.
29. 8/1/2014-7/31/2015, PRF Fellowship, PI, *Lead in Bone and Neuropsychological Implications among a Pediatric Population with Elevated Pb Exposures*. \$18,000.  
To investigate the use of bone Pb as a biomarker for Pb exposure among a pediatric population.
30. 8/1/2014-7/31/2015. Purdue Bilsland Dissertation Fellowship. PI. *Validation of a Neutron Activation Analysis (NAA) System to Quantify Metals in Bone in vivo*. \$18,000.  
To validate an NAA system to quantify metals in bone *in vivo*.
31. 6/1/2011-7/31/2011. Purdue Research Foundation Faculty Summer Research Grant. PI. *Design a Novel In Vivo Neutron Activation Analysis System for Noninvasive Quantification of Mn in Bone with Monte Carlo Simulations*. \$8,000  
To design an IVNAA system for bone Mn analysis using MC simulations.
32. 7/1/2010-6/30/2011. NIOSH-funded ERC Pilot Research Grant at University of Illinois. PI. *Noninvasive In Vivo Quantification of Lead and Cadmium in Bone*. \$19,979.  
To develop novel x-ray technologies to quantify Pb and Cd in bone in vivo.
33. 7/1/2010-6/30/2011. NIOSH-funded ERC Pilot Research Grant at University of Michigan, PI. *Neurotoxic Effects of Cumulative Exposures to Manganese and Lead: A Novel Study on Welders*. \$15,531.  
To study the neurological effects of combined cumulative exposure to Mn and Pb.
34. 8/17/2009-8/16/2012, Purdue Startup Package. PI.  
To help new faculty member to start his/her career.