

Vibhudutta Awasthi

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Research Interests:

My research interests are in the development of radiopharmaceuticals, small animal imaging, and the use of radiological imaging techniques to answer physiological questions. My current research focuses on the development of liposome-encapsulated hemoglobin as an artificial oxygen carrier and he is studying cerebral oxygen metabolism using positron emission tomography. I am a board-certified nuclear pharmacist with expertise in areas related to drug delivery, formulation development, nuclear pharmacy, and small animal nuclear imaging.

Education:

1991-1994: Ph.D., Nuclear Medicine, Sanjay Gandhi Postgraduate Institute of Medical Sciences, India

1984-1990: M. Pharm., Pharmaceutics, Dr. Hari Singh Gour University, India

1972-1984: Intermediate PCB, Kendriya University, Sagar

Academic Appointments:

2006-Present: Professor, Department of Pharmaceutical Sciences, University of Oklahoma Health Science Center

2001-2006: Assistant Professor, Radiology, University of Texas Health Science Center at San Antonio

Awards and Honors:

Director of Research Imaging Facility

Endowed Chair in Nuclear Pharmacy

Research Support:

- 2017-2020: Oklahoma Center for the Advancement of Science and Technology (OCAST), "Immunogenetics of superhydrophilic polymer-modified liposome-encapsulated hemoglobin"
- 2017-2020: Department of Defense (DoD), "Pharmacotherapy of traumatic brain injury accompanied by hemorrhagic shock."

Selected Publications:

1. Awasthi S, Rahman N, Hedrick A, Awasthi V, Breshears M, Kosanke S. Analysis of health and lung injury markers in mice treated with TLR4-interacting SPA4 peptide. *Journal of Immunology (Annual Meeting Abstracts)*. 2019; 202 : 64.26
2. Mdzinarishvili A, Houson H, Sidorov E, Awasthi V. Detection of Cerebral Necrosis in Ischemic Stroke Using a New Infarct-Avid Agent 18F-Fluorodeoxyglucaric Acid (FGA) in a Mouse Model of Stroke. *BRAIN INJURY*. 2019; 33 : 215-215
3. Awasthi V, Awwad H O, Houson H, Hedrick A, Mdzinarishvili A, Standifer K. Hemorrhagic Shock Aggravates Traumatic Brain Injury: Evidence from PET Imaging Using 18F-Fluorodeoxyglucaric Acid in a Rat Model. *BRAIN INJURY*. 2019; 33 : 117-118
4. Awasthi V, Vilekar P, Rao G, Awasthi S. Anti-inflammatory mediators ST2 and SIGIRR are induced by diphenyldifluoroketone EF24 in lipopolysaccharide-stimulated dendritic cells. *Immunobiology*. 2019
5. Virani N, Hedrick A, Wu D, Southard B, Liu H, Awasthi V, Harrison R. Enhanced computed tomography imaging of breast cancer via phosphatidylserine targeted gold nanoparticles. *Biomedical Physics & Engineering Express*. 2019; 5 : 065019
6. Mare R, Fresta M, Cosco D, Awasthi V. Anchoring Property of a Novel Hydrophilic Lipopolymer, HDAS-SHP, Post-Inserted in Preformed Liposomes. *Nanomaterials*. 2019; 9 : 1185
7. Nkepan G N, Gali H, Houson H, Hedrick A F, Hayes B, Causey O, Inman P, Box J, Benton E, Galbraith W, Awasthi V. Production of [13N]ammonia from [13C]methanol on a 7.5 MeV cyclotron using $^{13}\text{C}(p, n)^{13}\text{N}$ reaction: Detection of myocardial infarction in a mouse model. *Applied radiation and isotopes* . 2019; 150 : 19-24
8. Nkepan G N, Gali H, Houson H, Hedrick A F, Hayes B, Causey O, Inman P, Box J, Benton E, Galbraith W, Awasthi V. Production of [13N]ammonia from [13C]methanol on a 7.5 MeV cyclotron using $^{13}\text{C}(p, n)^{13}\text{N}$ reaction: Detection of myocardial infarction in a mouse model. *Applied Radiation and Isotopes*. 2019; 150 : 19-24
9. Yari H, Nkepan G, Awasthi V. Surface Modification of Liposomes by a Lipopolymer Targeting Prostate Specific Membrane Antigen for Theranostic Delivery in Prostate Cancer. *Materials*. 2019; 12 : 756-776
10. Hopiavuori B R, Deák F, Wilkerson J R, Brush R S, Rocha-Hopiavuori N A, Hopiavuori A R, Sullivan M T, Ozan K G, Wren J D, Georgescu C, Szweda L, Awasthi V, Towner R, Sherry D M, Anderson R E, Agbaga M P. Homozygous Expression of Mutant ELOVL4 Leads to Seizures and Death in a Novel Animal Model of Very Long-Chain Fatty Acid Deficiency. *Molecular Neurobiology*. 2018; 55 : 1795-1813
11. Houson H, Mdzinarishvili A, Awasthi V. PET imaging of ischemic brain stroke necrosis with novel agent F-18-Fluorogluucaric Acid. *JOURNAL OF NUCLEAR MEDICINE*. 2018; 59
12. Awasthi S, Kumar G, Xie J, Beierle J, Awasthi V, Ramani V, Singh B, Breshears M, Kosanke S. Toll-like receptor-4-interacting surfactant protein-A-derived peptide reduces inflammation in a mouse model of intratracheal lipopolysaccharide challenge. *Journal of Immunology (Annual Meeting Abstracts)*. 2018; 200 : 174.10
13. Rao G, Nkepan G, Yari H, Xu J, Houson H, Teng C, Awasthi V. Ubiquitin Receptor RPN13 Mediates the Inhibitory Interaction of Diphenyldihaloketones CLEFMA and EF24 with the 26S Proteasome. *Frontiers in Chemistry* . 2018; 6 : 392

14. Rao G, Houson H, Nkepan G, Yari H, Teng C, Awasthi V. Induction of Gut Proteasome Activity in Hemorrhagic Shock and its Recovery by Treatment with Diphenyldihaloketones CLEFMA and EF24. *Am J Physiol Gastrointest Liver Physiol* . 2018; 315 : G318-G327
15. Houson H, Nkepan G, Hedrick A, Awasthi V. Imaging of isoproterenol-induced myocardial injury with F-18-labeled fluoroglucuric acid in a rat model. *Nucl Med Biol*. 2018; 59 : 9-15
16. Awwad H O, Durand C D, Gonzalez L P, Tompkins P, Zhang Y, Lerner M R, Brackett D J, Sherry D M, Awasthi V, Standifer K. Post-blast treatment with Nociceptin/Orphanin FQ peptide (NOP) receptor antagonist reduces brain injury-induced hypoxia and signaling proteins in vestibulomotor-related brain regions. *Behavioural brain research*. 2018
17. Raghuvanshi D, Nkepan G, Hussain A, Yari H, Awasthi V. Stability studies on an anti-cancer drug 4-(3,5-bis(2-chlorobenzylidene)-4-oxo-piperidine-1-yl)-4-oxo-2-butenoic acid (CLEFMA) using a stability-indicating HPLC method. *J Pharm Anal*. 2017; 7 : 1-9
18. Pathuri G, Hedrick A F, Awasthi V, Cowley, Jr B D, Gali H. Synthesis and in vivo evaluation of ortho-[124I]iodohippurate for PET renography in healthy rats. *Appl Radiat Isot*. 2016; 115 : 251-5
19. Yadav V R, Rao G, Houson H, Hedrick A, Awasthi S, Roberts P R, Awasthi V. Nanovesicular liposome-encapsulated hemoglobin (LEH) prevents multi-organ injuries in a rat model of hemorrhagic shock. *European journal of pharmaceutical sciences : official journal of the European Federation for Pharmaceutical Sciences*. 2016; 93 : 97-106
20. Rao G, Yadav V, Awasthi S, Roberts P, Awasthi V. Effect of liposome-encapsulated hemoglobin resuscitation on proteostasis in small intestinal epithelium after hemorrhagic shock. *Am J Physiol Gastrointest Liver*. 2016; 311 : G180-189
21. Nkepan G N, Hedrick A F, Awasthi V, Gali H. Facile synthesis of para-[18F]fluorohippurate via iodonium ylide-mediated radiofluorination for PET renography. *Bioorg Med Chem Lett*. 2016; 26 : 479-83
22. Pathuri G, Hedrick A F, Awasthi V, Cowley, Jr B D, Gali H. Evaluation of [18F]PFH PET renography to predict future disease progression in a rat model of autosomal dominant polycystic kidney disease. *Nucl Med Biol*. 2016; 43 : 1-5
23. Pathuri G, Hedrick A F, January S E, Galbraith W, Awasthi V, Arnold C D, Cowley B D, Gali H. Synthesis and in vivo evaluation of gallium-68-labeled glycine and hippurate conjugates for positron emission tomography renography. *J Labelled Compd Rad*. 2015; 58 : 14-19
24. Vilekar P, Rao G, Awasthi S, Awasthi V. Diphenyldifluoroketone EF24 suppresses pro-inflammatory interleukin-1 receptor 1 and toll-like receptor 4 in lipopolysaccharide-stimulated dendritic cells. *J Inflamm*. 2015; 12 : 55
25. Rao G, Croft B, Teng C, Awasthi V. Ubiquitin-proteasome system in neurodegenerative disorders. *J Drug Metab Toxicol* . 2015; 6 : 187
26. Rao G, Xie J, Hedrick A, Awasthi V. Hemorrhagic shock-induced cerebral bioenergetic imbalance is corrected by pharmacologic treatment with EF24 in a rat model. *Neuropharmacology*. 2015; 99 : 318-327
27. Jackson K, Christiansen V J, Yadav V R, Silasi-Mansat R, Lupu F, Awasthi V, Zhang R R, McKee P A. Suppression of tumor growth in mice by rationally designed

- pseudopeptide inhibitors of fibroblast activation protein and prolyl oligopeptidase. *Neoplasia*. 2015; 17 : 23-54
28. Awwad H O, Gonzalez L P, Tompkins P, Lerner M, Brackett D J, Awasthi V, Standifer K. Blast Overpressure Waves Induce Transient Anxiety and Regional Changes in Cerebral Glucose Metabolism and Delayed Hyperarousal in Rats. *Frontiers in neurology*. 2015; 6 : 132
 29. Gali H, Nkepan G N, Galbraith W, Awasthi V, Hammond K, Collier L. Preparation of [F-18]FLT using an ABT compact cyclotron and continuous flow microfluidics. *J Labelled Compd Rad*. 2015; 58 : S362
 30. Pathuri G, Hedrick A F, Umoru G, Awasthi V, Cowley, Jr. B D, Gali H. Synthesis and in vivo evaluation of ⁶⁸Ga-probestin for renal cortical imaging by PET. *J Labelled Compd Rad*. 2015; 58 : S409
 31. Rao G, Hedrick A, Yadav V, Xie J, Awasthi V, Hussain A. The brain metabolic activity after resuscitation with liposome-encapsulated hemoglobin (LEH) in a rat model of hypovolemic shock. *J Cereb Blood Flow Metab*. 2015; 35 : 1528-1536
 32. Pathuri G, Hedrick A, Awasthi V, Cowley B, Gali H. Evaluation of para-¹⁸F-fluorohippurate PET renography to predict future disease progression in a rat model of ADPKD. *J Nucl Med*. 2015; 56 : 1077
 33. Anzellotti, A, Bailey J, Ferguson D, McFarland A, Bochev P, Andreev G, Awasthi V, Brown-Proctor C. Automated production and quality testing of [¹⁸F]labeled radiotracers using the BG75 system. *J Radional Nucl Chem*. 2015; 305 : 387-401
 34. Yadav V R, Hussain A, Jun X, Kosanke S, Awasthi V. The salutary effects of diphenyldifluoroketone EF24 in liver of a rat hemorrhagic shock model. *Scand J Trauma Resus & Emergency Medicine*. 2015; 23 : 8
 35. Awasthi V. Liposomes modified with superhydrophilic polymer-linked to a non-phospholipid anchor exhibit reduced complement activation and enhanced circulation. *J Pharm Sci*. 2015; 104 : 114-123
 36. Kasus-Jacobi A, Nag O, Awasthi V, Babizhayev M, Pereira A. Investigating carcinine transport and the expression profile of transporter genes in human corneal epithelial cells. *Springer*. 2015
 37. Gopal P, Hedrik A, January S, Galbraith W, Awasthi V, Gali H. Pathuri Gopal, Hedrik AF, January S*, Galbraith W, Awasthi V, Arnold CD, Cowley BD, Gali H. Synthesis and in vivo evaluation of gallium-68 labeled glycine and hippurate conjugates for PET renography. *J. Label Compd. Radiopharm* 2015;58:14–19. 2015
 38. Pathuri G, Hedrick A F, January S E, Galbraith W, Awasthi V, Arnold C D, Cowley B D, Galia H. Synthesis and in vivo evaluation of gallium-68-labeled glycine and hippurate conjugates for positron emission tomography renography. *Journal of Labelled Compounds and Radiopharmaceuticals*. 2015; 58 : 14-19