Rabab Hamzah PhD.

Mobile: (501)-766-7541
rnhamzah@ualr.edu
RNHamzah@uams.edu
https://scholar.google.com/citations?user=gETsUZwAAAAJ&hl=en

EDUCATION

Ph.D. Applied Science / Chemistry Graduation: Aug/2021
University of Arkansas at Little Rock, Little Rock, AR
Dissertation tittle: "Labeling and characterization of exosomes to elucidate their cellular uptack within tumor and stromal cells"
Advisors: Dr. Robert J.Griffin University of Arkansas for medical sciences
Dr. Alexandru S.Biris University of Arkansas at little rock

MA Chemistry Graduation: May/2021
University of Arkansas at Little Rock, Arkansas, USA

M.Sc. Applied Science Graduation: Aug/2016
University of Arkansas at Little Rock, Arkansas, USA
Thesis title: "Fluorescent Graphene for Cancer Cells Targeting and Detection"
Advisor: Dr. Alexandru S.Biris

B. Sc. Biochemical Technology (Ranked 6 out of 65) Graduation: May/2010
University of Technology, Baghdad, Iraq

AWARDS

Scholarship Award 2013-2016
The Higher Committee for Education Development in Iraq (HCED), IRAQ.
This scholarship was awarded to the top 10 students in the department of Biochemical technology to complete a master's study in the united states.

Scholarship Award 2017-2021
National science foundation (NSF) EPSCoR, ASSETIII, USA.
This scholarship was awarded for completing a Ph.D. study.

RESEARCH EXPERIENCE

PROFESSIONAL SUMMARY: Passioned researcher familiar with Bio-nanotechnology science. Highly motivated in establishing novel methods and protocols. Ready for next research challenges.

Skills:

- Cell cultures, Immunostaining, Cell imaging, Protein quantification, Clonogenic assay, Scratch assay, Cells proliferation and viability assay, Cytotoxicity assay, Western blot, PCR, ELISA.

- Advanced research in Exosomes isolation, characterization, labeling, tracking, and Immunogold labeling.
- Nano particle tracking analysis (NTA), Zeta potential, Cytation5, Laser scanning confocal microscopy, Flow cytometry, photothermal microscopy (PTM), Photoacoustic fluorescence flow cytometry (PA-Flow), TEM, Ultra-Microtome, Cryo-EM, SEM, AFM, XRD, XPS, UV-Vis and Fluorescence Spectroscopy, X-Ray, Patch Clamp, Multi well microelectrode array (MEA).
- Nanoparticle functionalization, characterization and drug loading.
- Biological sample preparation for SEM and TEM.

COURSES

Core Courses: Advanced Inorganic Chemistry (CHEM 7340), Advanced Analytical Chemistry (CHEM 7311), Organic Reaction Mechanism (CHEM 7350).
Special Topics: Micro & Nano Fabrication (ASCI 7318), Biological Molecules (ASCI 7375), ST:Design-Molecules/Drug Prop (CHEM 7359), Nanostruc Matl: Phys/Chem Prop (SYEN 7317), Instrumental Analysis (CHEM 5411).

WORK HISTORY

Graduate research assistant, 2017- 2021
University of Arkansas for medical sciences and University of Arkansas at Little Rock
Working on different projects:

- Developing a new method to label and track extracellular vesicles to understand their biological effect in vitro.
- Establishing a novel approach to study the artificial gold nanorod substrate's biological effect on stem cell differentiation to develop a new method for nerve regenerations.
- Study the effect of exosome source on the stem cells differentiations. This work collaborates with Dr. Jennifer Yanhua Xie, Assistant Professor, Department of Basic Sciences, New York Institute of Technology, College of Osteopathic Medicine, Arkansas, USA.

Post graduate research assistant, Aug 2016- Aug 2017
Center for integrative nanotechnology sciences, UALR, Arkansas, USA

- Worked on design and constructed anastomotic guide for use in anastomosis of the small intestine. This work collaborated with Dr. David Anderson, Department of Large Animal Clinical Sciences, College of Veterinary Medicine, University of Tennessee Knoxville, Tennessee, USA

Lecturer Aug 2011-Aug 2013
Department of chemistry, University of Karbala, Karbala, Iraq

- Successfully taught the following courses as part of my teaching responsibilities:
  Biochemistry laboratory (number of students 30)
  Analytical Chemistry laboratory (number of students 30)

Clinical laboratory technician Aug 2010-April 2011
AL-Mustafa clinical laboratory, Baghdad, Iraq

PROFESSIONAL TRAINING

Workshop
Bio-Trac Training Programs at the Montgomery College Bioscience Education Center, May/2020.
Exosomes: Principles and Methods

Training
Center for Integrative nanotechnology sciences, Oct/2018
Exosomes preparation and imaging by transmission electron microscopy.

Workshop
University of Arkansas for medical science, March 2018
Genomics.

PROFESSIONAL AFFILIATIONS

- Society for Thermal Medicine (STM). 2017-2019
- International Society for Extracellular Vesicles (ISEV). 2020-2021

PROFESSIONAL ACTIVITY

Reviewer at:

- Archives of cancer biology and therapy.
- The journal of cancer metastasis and treatment.

PRESENTATIONS AND PARTICIPATION

- 3min presentation at NSF EPSCoR retreat meeting 2018
- 3min presentation at NSF EPSCoR retreat meeting 2019
- Delivered poster presentation on Labeling and tracking of exosomes to develop cell therapy and differentiation strategies at Nanotechnology for Health Care conference 2020
- Delivered poster presentation on Nanomaterial labeling of exosomes for cell biology at international society for extracellular vesicles annual meeting 2020

Book chapter

Rabab N.Hamzah, Rajshekar A.Kore, Karrer M.Alghazali, Fumiya Watanbe, Alexandru S.Biris and Robert J.Griffin. Exosomes as Naturally Occurring, Abundant Nanoscale Soft Materials: Potential as Biomarkers and Delivery Vehicles for Solving Biomedical Problems. Book Chapter. **Journal of world scientific** 2020.

Journal publications

Rabab N. Hamzah, Karrer M.Alghazali, Alexandru S.Biris, Robert J.Griffin. Exosome Traceability and Cell Source Dependence on Composition and Cell-Cell Cross Talk. International od Molecular Sciences. doi:10.3390/ijms22105346.

Alisha P. Pedersen, Karrer M. Alghazali, **Rabab N. Hamzah**, Pierre-Yves Mulon, Megan McCracken , Rebecca E. Rifkin, Anwer Mhannawee, Zeid A. Nima, Christopher Griffin, Robert L. Donnell, Alexandru S. Biris and David E. Anderson. Development and *in vivo* Assessment of a Rapidly Collapsible Anastomotic Guide for Use in Anastomosis of the Small Intestine: A Pilot Study Using a Swine Model. **Frontiers in Surgery**. doi: 10.3389/fsurg.2020.587951.

Krishna D. Sharma, Danielle Schaal, Rajshekhar A. Kore, **Rabab N. Hamzah**, Sahitya Chetan Pandanaboina , Abdallah Hayar, Robert Griffin, Malathi Srivatsan, Nathan S. Reyna, Jennifer Y. Xie. Glioma-derived exosomes drive the differentiation of neural stem cells to astrocytes. **PLoS One** https://doi.org/10.1371/journal.pone.0234614 . 2020.

Rajshekhar A. Kore, Curran Henson, **Rabab N.Hamzah**, Robert J. Griffin, Alan J. Tackett, Zufeng Ding, Jawahar L. Mehta. Molecular events in MSC exosome mediated cytoprotection in cardiomyocytes. **Scientific Report** (2019) 9:19276 https://doi.org/10.1038/s41598-019-55694-7.

Karrer M. Alghazali, **Rabab N. Hamzah**, Zeid A. Nima, Richard Steiner, Madhu Dhar, David E. Anderson, Abdallah Hayar, Robert J. Griffin and Alexandru S. Biris. Plasmonic Nanofactors as Switchable Devices to Promote or Inhibit Neuronal Activity and Function. **Nanomaterials** 2019, 9, 1029; doi:10.3390/nano9071029.

Alghazali KM, Newby SD, Nima ZA, **Hamzah RN**, Watanabe F, Bourdo SE, Masi TJ, Stephenson SM, Anderson DE, Dhar MS, Biris AS. Functionalized gold nanorod nanocomposite system to modulate differentiation of human mesenchymal stem cells into neural-like progenitors. **Scientific Reports** | 7: *16654* | DOI:10.1038/s41598-017-16800-9.

Zeid A. Nima, Ahmed M. Alwbari, Vijayalakshmi Dantulur, **Rabab N. Hamzah,** Natasha Sra ,Pooja Motwani, Konstantinos Arnaoutakis, Rebecca A. Levy, Amani F. Bohliqa, Dmitry Nedosekin, Vladimir P. Zharov, Issam Makhoul, Alexandru S. Biris. Journal of Applied Toxicology. Targeting nano drug delivery to cancer cells using tunable, multi-layer, silver-decorated gold nanorods. **Journal of Applied Toxicology**. 2017;37:1370–1378.

Alghazali KM, Nima ZA, **Hamzah RN**, Dhar MS, Anderson DE, Biris AS. Bone-tissue engineering: complex tunable structural and biological responses to injury, drug delivery, and cell-based therapies. **Drug Metabolism Review**. 2015;47(4):431-54. PubMed PMID: 26651522.

Manuscript under preparation

Review paper: Nanoparticle labeled exosomes as theranostic agents.

Research article: Exosome-Stem cell co-cultures to guide stem cell differentiation.

Research article: Gold nanorod substrate for rat fetal neural stem cell differentiation into oligodendrocytes.

Research article: Surgical application of a rapidly degradable, intraluminal anastomotic guide for enhanced surgical performance of end-to-end small intestinal anastomosis.