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Area of Expertise

I am currently Dean, Graduate School of Biomedical Sciences at the University of North Texas Health Science Center. In my previous appointments as Director, Gene Therapy Program and Chair, Department of Comparative Biomedical Sciences I have undertaken the role of mentoring early-career faculty members, since mentoring is a well-established resource critical to the success of junior faculty researchers. Having had the opportunity to recruit new faculty at the Assistant Professor level, I have previously worked to establish formal mentored career development programs that would support early-career faculty, and to facilitate informal mentoring opportunities for promoting their career advancement. In continuing my education through an Ed.D. program in Higher Education Administration, I completed a dissertation research project entitled "Early-career faculty perceptions of seeking extramural funding for academic biomedical research", in which mentoring was identified as a major theme. These experiences have allowed me to provide early-career faculty with targeted feedback in support of their research projects, as well as their academic contribution to teaching and service. In my own laboratory research, I am working in translational research of cancer to develop multiple methods for gene and cell therapy, particularly in the use of virus-based and nanoparticle delivery vehicles. I have worked extensively with oncolytic virus vectors for many years, and my laboratory is modifying capsid proteins on virus vectors for cancer retargeting, as well as developing cancer vaccines and conditionally replicating virus vectors for cancer therapy. I have extensive experience in analysis of gene expression using quantitative RT-PCR. In support of translational cancer studies in my laboratory, I have extensive experience immortalizing cell lines from primary tumors and performing co-culture experiments. I have established small animal imaging capability, and I have worked to develop methods for non-invasive monitoring of oncolytic virus and nanoparticle biodistribution in vivo. Among the various methods I have developed are novel modifications of virus capsid proteins to allow SPECT (single photon emission computed tomography) imaging in vivo.

Qualifications

MHA, Louisiana State University
BS in Chemistry, Texas A & M University
EdD, University of Alabama
PhD Biochemistry, University of Texas Southwestern Medical Center

Recent Publications

¹⁷⁷Lu-Labeled Eu-Doped Mesoporous SiO₂ Nanoparticles as a Theranostic Radiopharmaceutical for Colorectal Cancer
Viana, R. D. S., Costa, L. A. D. M., Harmon, A. C., Gomes Filho, M. A., Falcão, E. H. L., Vicente, M. G. H., Junior, S. A. & Mathis, J. M., 25 Sep 2020, In: ACS Applied Nano Materials. 3, 9, p. 8691-8701 11 p.

Mechanistic studies of cytotoxic activity of the mesoionic compound MIH 2-4BI in MCF-7 breast cancer cells

Costa, L. A. D. M., Debnath, D., Harmon, A. C., Araujo, S. D. S., Souza, H. D. D. S., Filho, P. F. D. A., Wischral, A., Filho, M. A. G. & Mathis, J. M., Sep 2020, In: Oncology Letters. 20, 3, p. 2291-2301 11 p.

Synthesis and investigation of phthalocyanine-biotin conjugates

Okoth, E. A., Zhou, Z., Ongarora, B., Stutes, A., Mathis, J. M. & Vicente, M. G. H., 1 Jan 2020, *Porphyrin Science By Women (In 3 Volumes)*. World Scientific Publishing Co., p. 238-248 11 p.

Cytotoxic Activity of the Mesoionic Compound MIH 2.4BI in Breast Cancer Cell Lines

Amaral de Mascena Costa, L., Harmon, A. C., Aguiar Coelho Teixeira, A., Cássio Silva de Lima, F., de Sousa Araújo, S., Del Piero, F., Diógenes da Silva Souza, H., Filgueiras de Athayde Filho, P., Alves Junior, S., de Mascena Diniz Maia, M., Wischral, A., Adrião Gomes Filho, M. & Mathis, J. M., 2020, In: Breast Cancer: Basic and Clinical Research. 14

Tumor-Targeting NIRF NanoGUMBOS with Cyclodextrin-Enhanced Chemo/Photothermal Antitumor Activities

Chen, M., Pérez, R. L., Du, P., Bhattarai, N., McDonough, K. C., Ravula, S., Kumar, R., Mathis, J. M. & Warner, I. M., 8 Jul 2019, In: ACS Applied Materials and Interfaces. 11, 31, p. 27548-27557 10 p.

Synthesis, Characterization, and Evaluation of Near-IR Boron Dipyrromethene Bioconjugates for Labeling of Adenocarcinomas by Selectively Targeting the Epidermal Growth Factor Receptor

Kaufman, N. E. M., Meng, Q., Griffin, K. E., Singh, S. S., Dahal, A., Zhou, Z., Fronczek, F. R., Mathis, J. M., Jois, S. D. & Vicente, M. G. H., 11 Apr 2019, In: *Journal of Medicinal Chemistry*. 62, 7, p. 3323-3335 13 p.

Surface modification strategy based on the conjugation of NaYF₄:5%Eu luminescent nanoprobe with organic aromatic compounds for application in bioimaging assays

da Silva Viana, R., de Mascena Costa, L. A., Leal, A. N. R., Williams, T. M., Luan, L., Zhang, G., Wang, M., Harmon, A. C., dos Anjos, J. V., Cueto, R., Filho, M. A. G., Falcão, E. H. L., Vicente, M. G. H., Junior, S. A. & Mathis, J. M., 1 Jan 2019, In: *Journal of Nanoparticle Research*. 21, 1, 23.

Synthesis and investigation of phthalocyanine-biotin conjugates

Okoth, E. A., Zhou, Z., Ongarora, B., Stutes, A., Mathis, J. M. & Vicente, M. G. H., 1 Jan 2019, In: *Journal of Porphyrins and Phthalocyanines*. 23, 1-2, p. 125-135 11 p.

Endocytic Selective Toxicity of Rhodamine 6G nanoGUMBOS in Breast Cancer Cells

Bhattarai, N., Mathis, J. M., Chen, M., Pérez, R. L., Siraj, N., Magut, P. K. S., McDonough, K., Sahasrabudhe, G. & Warner, I. M., 4 Sep 2018, In: *Molecular Pharmaceutics*. 15, 9, p. 3837-3845 9 p.

Oncolytic virotherapy for breast cancer treatment

O'bryan, S. M. & Mathis, J. M., 2018, In: *Current Gene Therapy*. 18, 4, p. 192-205 14 p.