Amalendu Ranjan, PhD
College of Biomedical and Translational Sciences
Microbiology, Immunology & Genetics
Email: Amalendu.Ranjan@unthsc.edu



Area of Expertise

My research focuses on the development, characterization and application of nanotechnology based drug delivery systems that carry drugs to target sites in the body. The goal is to overcome the various therapeutic barriers using novel nano-platforms for the treatment of cancer and other diseases. My research centers on encapsulating various types of hydrophobic, hydrophilic, and small molecule drugs and imaging agents in nanoparticles and producing lab-scale and large-scale batches.
The three main areas of my research include:
1) Biomimetic drug delivery systems: bio-mimicking natures created by covering a polymeric nanoparticle with a cellular membrane extracted directly from cells;
2) Polymeric based nanoparticles: including the synthesis of targeted and non-targeted PLGA based nanoparticles. The targeting molecules such as peptides or antibodies may be attached using a linker which is either non-covalent or covalent to the polymeric or lipid surface using surface chemistry;
3) Curcumin Nano therapeutics: we have developed various nanoformulations using curcumin and are actively working to improve these nanoformulations to provide an effective way to deliver this drug.

Qualifications

BS in Chemical Engineering, Birsa Institute of Tech-Sindri

MTech in Chemical Engineering, IIT Bombay

PhD in Biochemical Engineering, IIT Delhi

Recent Publications

Evolving Landscape of Glioblastoma Research: Integrating Therapeutic Advances and Diagnostic Frontiers
Sabnis, N. A., Cooksey, L. C., Jayakumar, H., Moguel Mendez, M., Mathew, E., Petty, R. M., Ranjan, A., Colon-Perez, L., Dickerman, R., Mathew, P. A. & Bunnell, B. A., May 2026, In: Brain Sciences. 16, 5, 487.

Optimized PLGA encapsulated SA-2 nanosuspension exhibits sustained intraocular pressure reduction in the mouse microbead occlusion model of ocular hypertension
Amankwa, C. E., DebNath, B., Pham, J. H., Johnson, G. A., Zhang, W., Ranjan, A., Stankowska, D. L. & Acharya, S., 1 Mar 2025, In: European Journal of Pharmaceutical Sciences. 206, 107016.

Prodrug nanotherapy demonstrates in vivo anticryptosporidial efficacy in a mouse model of chronic Cryptosporidium infection
Ranjan, A. P., Czyzyk, D. J., Martinez-Traverso, G., Sadiqova, A., Valhondo, M., Schaefer, D. A., Spasov, K. A., Jorgensen, W. L., Vishwanatha, J. K., Riggs, M. W., Castellanos-Gonzalez, A. & Anderson, K. S., 19 Sep 2024, In: RSC Pharmaceutics. 1, 5, p. 963-975 13 p.

Proof-of-concept studies with a computationally designed M^{pro} inhibitor as a synergistic combination regimen alternative to Paxlovid
Papini, C., Ullah, I., Ranjan, A. P., Zhang, S., Wu, Q., Spasov, K. A., Zhang, C., Mothes, W., Crawford, J. M., Lindenbach, B. D., Uchil, P. D., Kumar, P., Jorgensen, W. L. & Anderson, K. S., 23 Apr 2024, In: Proceedings of the National Academy of Sciences of the United States of America. 121, 17, e2320713121.

Surgical Primary Tumor Resection Reduces Accumulation of $CD11b^{+}$ Myeloid Cells in the Lungs Augmenting the Efficacy of an Intranasal Cancer Vaccination against Secondary Lung Metastasis
Donkor, M., Choe, J. Y., Reid, D. M., Fiadjoe, H. K., Quinn, B., Ranjan, A., Pulse, M., Chaudhary, P., Basha, R. & Jones, H. P., Jan 2024, In: Pharmaceuticals. 17, 1, 51.

Cabazitaxel-Loaded Nanoparticles Reduce the Invasiveness in Metastatic Prostate Cancer Cells: Beyond the Classical Taxane Function
Lampe, J. B., Desai, P. P., Tripathi, A. K., Sabnis, N. A., Chen, Z., Ranjan, A. P. & Vishwanatha, J. K., Feb 2023, In: Pharmaceutics. 15, 2, 662.

Nasal Tumor Vaccination Protects against Lung Tumor Development by Induction of Resident Effector and Memory Anti-Tumor Immune Responses
Donkor, M., Choe, J., Reid, D. M., Quinn, B., Pulse, M., Ranjan, A., Chaudhary, P. & Jones, H. P., Feb 2023, In: Pharmaceutics. 15, 2, 445.

Novel Use of Hypoxia-Inducible Polymerizable Protein to Augment Chemotherapy for Pancreatic Cancer
Gdowski, A., Hayatshahi, H., Fudala, R., Joshi, R., Liu, J., Vishwanatha, J. K., Jeyarajah, R., Guzik, P. & Ranjan, A. P., Jan 2022, In: Pharmaceutics. 14, 1, 128.

Bioinspired Nanoparticles Engineered for Enhanced Delivery to the Bone
Gdowski, A. S., Lampe, J. B., Lin, V. J. T., Joshi, R., Wang, Y. C., Mukerjee, A., Vishwanatha, J. K. & Ranjan, A. P., 25 Oct 2019, In: ACS Applied Nano Materials. 2, 10, p. 6249-6257 9 p.

In vivo imaging and biodistribution of near infrared dye loaded brain-metastatic-breast-cancer-cell-membrane coated polymeric nanoparticles
Kumar, P., Treuren, T. V., Ranjan, A. P., Chaudhary, P. & Vishwanatha, J. K., 15 Apr 2019, In: Nanotechnology. 30, 26, 265101.

Sponsored Projects

2/2 Langston University-UNTHSC
Basha, R. (PI) & Ranjan, A. (CoI)
NCI: National Cancer Institute
20/09/18 → 31/08/24

2/2 Langston University-UNTHSC Partnership for Cancer Research and Education Core
Vishwanatha, J. (PI) & Ranjan, A. (CoI)
NCI: National Cancer Institute
20/09/18 → 31/08/22

2/2 Langston University-UNTHSC Partnership for Cancer Research and Education Core
Vishwanatha, J. (PI) & Ranjan, A. (CoI)
NCI: National Cancer Institute
20/09/18 → 31/08/22

Anti-Neuropilin Conjugated Theranostic Hybrid Nanoparticles Co-Encapsulating Curcumin and Methlyene Blue for Combinatorial Therapy of Glioblastoma
Ranjan, A. (PI) & Yang, S. (CoI)
Intramural Research(UNTHSC)
1/09/13 → 31/08/15

Investigating Serum Exosomal A
Vishwanatha, J. (PI), Suzuki, S. (CoI), Chaudhary, P. (CoI), Thyagarajan, S. (CoI) & Ranjan, A. (CoI)
NCI: National Cancer Institute
1/07/17 → 30/06/25

Molecular Beacon-Based Nanoparticles for TNBC Imaging and Targeted Therapy
Vishwanatha, J. (PI), Gryczynski, Z. (CoI) & Ranjan, A. (CoI)
NCI: National Cancer Institute
19/02/15 → 31/01/18

Nano-G: Rescuing grepafloxcin by Mitigating its QT Prolongation for Faster Clinical Translation
Ranjan, A. (PI) & Simecka, J. (CoI)
Intramural Research(UNTHSC)
1/06/17 → 31/05/18

NRMNet: A national resource for mentorship and networking to enhance diversity
Vishwanatha, J. (PI) & Ranjan, A. (CoI)
NIMHD: Natl Institute on Minority Health
1/07/19 → 30/06/24

NRMNet: A national resource for mentorship and networking to enhance diversity
Vishwanatha, J. (PI) & Ranjan, A. (CoI)
NIGMS: General Medical Sciences
1/07/19 → 30/06/24

Promoting Diversity in Research Training for Health Professionals
Vishwanatha, J. (PI), Cunningham, T. (CoI), Schreihofer, A. (CoI) & Ranjan, A. (PI)
NHLBI: Nat Heart, Lung & Blood Institute
15/05/16 → 30/04/23

Studies with Curcumin ER
Vishwanatha, J. (PI) & Ranjan, A. (CoI)
SignPath Pharmaceuticals, Inc.
1/08/13 → 31/01/15

Targeted Multifunctional Lipid-PLGA Hybrid Nanosystems for Metastatic Breast Cancer Imaging and Therapy
Ranjan, A. (PI)
Intramural Research(UNTHSC)
14/01/13 → 13/07/14

Texas Center for Minority Health Education, Research and Outreach - Administrative Core
Vishwanatha, J. (PI), Jones, H. (CoI), Chaudhary, P. (CoI) & Ranjan, A. (CoI)
NIMHD: Natl Institute on Minority Health
16/07/12 → 31/05/18

Texas Center of Minority Health, Education, Research and Outreach - Admin/Development Core
Vishwanatha, J. (PI), Mallet, R. (CoI), Jones, H. (CoI), Fulda, K. (CoI), Ranjan, A. (CoI) & Basha, R. (CoI)
NIMHD: Natl Institute on Minority Health
23/09/17 → 31/05/22