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EDUCATION

- ◆ Ph.D. in pharmaceutical Sciences, 2016 (Thesis title: “Polymeric Nanocarriers for Delivery of Small Molecules and miRNAs for the Treatment of Liver Fibrosis and Pancreatic Cancer”, thesis advisor: Prof. Ram I. Mahato).
- ◆ M.S. in Industrial Pharmacy, 2009, St. John’s University New York, specialization: Pharmaceutics.
- ◆ M.Pharm. in Pharmaceutics, 2005, Guru Jambheshwar University, India, specialization: Drug Delivery.
- ◆ B.Pharm. in Pharmacy, 2003, Guru Jambheshwar University, India, specialization: Drug design and Delivery.

RESEARCH EXPERIENCE

Research Instructor (2018-present), Postdoctoral Associate (2016-2018): Department of Pharmaceutical Sciences, University of Nebraska Medical Center (research advisor: Prof. Ram I. Mahato).

- ◆ Synthesized self-assembled organic polymer nanoparticles for targeted drug delivery and accumulation in the tumor tissue.
- ◆ Polymer synthesis, formulation design, and targeting to specific organs such as liver and brain.
- ◆ Development of drug/imaging modalities and targeting moieties for efficient treatments.
- ◆ Determined pharmacokinetics and biodistribution and of small molecules and miRNAs.
- ◆ Evaluated dry powder inhalation (DPI) formulations in terms of their physicochemical and aerodynamic properties and cellular uptake.
- ◆ miRNA profiling and gene sequencing of different diseases including liver fibrosis and medulloblastoma.
- ◆ Extensive experience with transgenic animal models, cell lines and primary cell cultures, especially murine liver cells and human bone marrow derived stem cells.
- ◆ Developed a flow cytometric strategy to stain immune cell populations that take part in graft versus host disease (GVHD) and their subsequent biochemical and molecular analysis.
- ◆ Standardization of Affymetrix gene expression microarray (instrumentation and data analysis).
- ◆ Extensive knowledge of solubility enhancement techniques including salt selection, solid dispersion using hot melt extrusion, nanomilling, size reduction, cosolvents and lipid based delivery systems.

INDUSTRIAL EXPERIENCE

- ◆ **Formulation Scientist**, A&Z Pharmaceuticals, NY 2010 – 2011
Responsibilities

- ◆ Performed formulation development and optimization based on physico-chemical and biopharmaceutical properties of drug molecules.
- ◆ Executed R&D trials to pilot batches, including process optimization of oral dosage form unit operations using FDA's Quality by Design (QbD).
- ◆ Worked with preformulation team for API solid state and formulation characterization for establishment of optimal process parameters and scale up.

RESEARCH INTERESTS

- ◆ In vivo delivery of miRNA and small molecules based on new biodegradable polymeric nanoparticles.
- ◆ Design and Development of Biomaterials for Delivery of Bioactive Agents.
- ◆ Mechanism-driven chemotherapy/immunotherapy combinations for the treatment of solid tumors and inflammatory diseases.
- ◆ Development of innovative inhaled therapies to address serious pulmonary diseases to improve how drugs are directed into the lungs.

TEACHING EXPERIENCE

Postdoctoral Associate (2016): College of Pharmacy, University of Nebraska Medical Center

- ◆ PHSC960 PSGP Journal Club.

PUBLICATIONS AND PRESENTATIONS

Journal articles

1. Xin X, Kumar V, Lin F, Kumar V, Bhattarai Rajan, Bhatt V, Tan C, and Mahato RI, Redox-responsive nanoplatform for codelivery of miR-519c and gemcitabine for pancreatic cancer therapy. *Science Advances*, 2020: Vol. 6, no. 46. DOI: 10.1126/sciadv.abd6764.
2. Bhattarai RS, Kumar V, Romanova S, Bariwal J, Chen H, Deng S, Bhatt VR, Bronich T, Li W, Mahato RI. Nanoformulation design and therapeutic potential of a novel tubulin inhibitor in pancreatic cancer. *J Control Release*. 2020 Sep 30;S0168-3659(20)30568-X. doi: 10.1016/j.jconrel.2020.09.052
3. Wang Q, Kumar V, Lin F, Sethi B, Coulter DW, McGuire TR, Mahato RI. ApoE mimetic peptide targeted nanoparticles carrying a BRD4 inhibitor for treating Medulloblastoma in mice. *J Control Release*. 2020 Jul 10;323:463-474. doi: 10.1016/j.jconrel.2020.04.053.
4. Kumar V, Bariwal J, Narang AS, Tso J, Cheong J, Mahato RI. Functional similarity of modified cascade impactor to deposit drug particles on cells. *Int J Pharm*. 2020 Jun 15;583:119404. doi: 10.1016/j.ijpharm.2020.119404.
5. Peng Y, Bariwal J, Kumar V, Tan C, Mahato RI. Organic Nanocarriers for Delivery and Targeting of Therapeutic Agents for Cancer Treatment. 2020 Feb 3; 2 1900136, 10.1002/adtp.201900136.
6. Kumar V, Dong Y, Kumar V, Almagawash S, Mahato RI. The use of micelles to deliver potential hedgehog pathway inhibitor for the treatment of liver fibrosis. *Theranostics*. 2019 Oct 12;9(25):7537-7555. doi: 10.7150/thno.38913.
7. Bariwal J, Kumar V, Dong Y, Mahato RI. Design of Hedgehog pathway inhibitors for cancer treatment. *Med Res Rev*. 2019 May;39(3):1137-1204. doi: 10.1002/med.21555.

8. Bariwal J, Kumar V, Chen H, Bhattarai RS, Peng Y, Li W, Mahato RI. Nanoparticulate delivery of potent microtubule inhibitor for metastatic melanoma treatment. *J Control Release*. 2019 Sep 10;309:231-243. doi: 10.1016/j.jconrel.2019.07.025.
9. Kumar V, Kumar V, Luo J, Mahato RI. Therapeutic Potential of OMe-PS-miR-29b1 for Treating Liver Fibrosis. *Mol Ther*. 2018 Dec 5;26(12):2798-2811. doi: 10.1016/j.ymthe.2018.08.022.
10. Kumar V, Kumar V, Chaudhary AK, Coulter DW, McGuire T, Mahato RI. Impact of miRNA-mRNA Profiling and Their Correlation on Medulloblastoma Tumorigenesis. *Mol Ther Nucleic Acids*. 2018 Sep 7;12:490-503. doi: 10.1016/j.omtn.2018.06.004.
11. Kumar V, Mundra V, Peng Y, Wang Y, Tan C, Mahato RI. Pharmacokinetics and biodistribution of polymeric micelles containing miRNA and small-molecule drug in orthotopic pancreatic tumor-bearing mice. *Theranostics*. 2018 Jul 5;8(15):4033-4049. doi: 10.7150/thno.24945.
12. Su Q, Kumar V, Sud N, Mahato RI. MicroRNAs in the pathogenesis and treatment of progressive liver injury in NAFLD and liver fibrosis. *Adv Drug Deliv Rev*. 2018 Apr;129:54-63. doi: 10.1016/j.addr.2018.01.009.
13. Kumar V, Kumar V, McGuire T, Coulter DW, Sharp JG, Mahato RI. Challenges and Recent Advances in Medulloblastoma Therapy. *Trends Pharmacol Sci*. 2017 Dec;38(12):1061-1084. doi: 10.1016/j.tips.2017.09.002.
14. Chaudhary AK, Mondal G, Kumar V, Kattel K, Mahato RI. Chemosensitization and inhibition of pancreatic cancer stem cell proliferation by overexpression of microRNA-205. *Cancer Lett*. 2017 Aug 28;402:1-8. doi: 10.1016/j.canlet.2017.05.007.
15. Kumar V, Chaudhary AK, Dong Y, Zhong HA, Mondal G, Lin F, Kumar V, Mahato RI. Design, Synthesis and Biological Evaluation of novel Hedgehog Inhibitors for treating Pancreatic Cancer. *Sci Rep*. 2017 May 10;7(1):1665. doi: 10.1038/s41598-017-01942-7.
16. Kattel K, Mondal G, Lin F, Kumar V, Mahato RI. Biodistribution of Self-Assembling Polymer-Gemcitabine Conjugate after Systemic Administration into Orthotopic Pancreatic Tumor Bearing Mice. *Mol Pharm*. 2017 May 1;14(5):1365-1372. doi: 10.1021/acs.molpharmaceut.6b00929.
17. Gill RK, Kumar V, Bishnoi M, Yadav K, Kondepudi KK, Bariwal J. Design and Green Synthesis of Thieno[2,3-d]pyrimidine Analogues as Potential Antiproliferative Agents. *Anticancer Agents Med Chem*. 2017;17(5):701-711. doi: 10.2174/1871520616666160817142647.
18. Gill RK, Kumar V, Robijns SCA, Steenackers HPL, Van der Eycken EV, Bariwal J. Polysubstituted 2-aminoimidazoles as anti-biofilm and antiproliferative agents: Discovery of potent lead. *Eur J Med Chem*. 2017 Sep 29;138:152-169. doi: 10.1016/j.ejmech.2017.06.043.
19. Dutta R, Kumar V, Peng Y, Evande RE, Grem JL, Mahato RI. Pharmacokinetics and Biodistribution of GDC-0449 Loaded Micelles in Normal and Liver Fibrotic Mice. *Pharm Res*. 2017 Mar;34(3):564-578. doi: 10.1007/s11095-016-2081-3. Epub 2016 Dec 19. PMID: 27995525.
20. Mondal G, Kumar V, Shukla SK, Singh PK, Mahato RI. EGFR-Targeted Polymeric Mixed Micelles Carrying Gemcitabine for Treating Pancreatic Cancer. *Biomacromolecules*. 2016 Jan 11;17(1):301-13. doi: 10.1021/acs.biomac.5b01419.
21. Kumar V, Mondal G, Dutta R, Mahato RI. Co-delivery of small molecule hedgehog inhibitor and miRNA for treating liver fibrosis. *Biomaterials*. 2016 Jan;76:144-56. doi: 10.1016/j.biomaterials.2015.10.047.

22. Gill RK, Kumar V, Gupta V, Singh G, Bariwal J. Design and microwave assisted synthesis of novel 2-phenyl/2-phenylethynyl-3-aryl thiophenes as potent antiproliferative agents *MedChemComm* 2016 Aug 7 (10), 1966-1972. Doi: 10.1039/C6MD90049F.
23. Kumar V, Mahato RI. Delivery and targeting of miRNAs for treating liver fibrosis. *Pharm Res.* 2015 Feb;32(2):341-61. doi: 10.1007/s11095-014-1497-x.
24. Mundra V, Peng Y, Kumar V, Li W, Miller DD, Mahato RI. Systemic delivery of nanoparticle formulation of novel tubulin inhibitor for treating metastatic melanoma. *Drug Deliv Transl Res.* 2015 Jun;5(3):199-208. doi: 10.1007/s13346-015-0226-2.
25. Kumar V, Mondal G, Slavik P, Rachagani S, Batra SK, Mahato RI. Codelivery of small molecule hedgehog inhibitor and miRNA for treating pancreatic cancer. *Mol Pharm.* 2015 Apr 6;12(4):1289-98. doi: 10.1021/mp500847s. Epub 2015 Feb 25. PMID:25679326; PMCID: PMC4829351.
26. Kumar V, Mundra V, Mahato RI. Nanomedicines of Hedgehog inhibitor and PPAR- γ agonist for treating liver fibrosis. *Pharm Res.* 2014 May;31(5):1158-69. doi: 10.1007/s11095-013-1239-5.
27. Singh S, Chitkara D, Kumar V, Behrman SW, Mahato RI. miRNA profiling in pancreatic cancer and restoration of chemosensitivity. *Cancer Lett.* 2013 Jul 1;334(2):211-20. doi: 10.1016/j.canlet.2012.10.008.
28. Chitkara D, Singh S, Kumar V, Danquah M, Behrman SW, Kumar N, Mahato RI. Micellar delivery of cyclopamine and gefitinib for treating pancreatic cancer. *Mol Pharm.* 2012 Aug 6;9(8):2350-7. doi: 10.1021/mp3002792.

Book Chapter

1. Kumar V, Wen D, Mahato RI, Non-Viral Delivery of Nucleic Acid Complexes. *Comprehensive Biomaterials II* 2017 May 4, 506–526.

Posters and Presentations

1. Poster presented entitled “**Therapeutic potential of OMe-PS-miR-29b1 for treating Liver Fibrosis**” in 5th Annual Biopharmaceutical Science Symposium 2018, UNMC, Omaha, NE.
2. Poster presented entitled “**Delivery of Chemically Stabilized MicroRNA for Treatment of Liver Fibrosis**” in 4th Annual Biopharmaceutical Science Symposium 2017, UNMC, Omaha, NE.
3. Poster presented entitled “**Delivery of Chemically Stabilized MicroRNA for Treatment of Liver Fibrosis**” in 20th Annual meeting of American Society of Gene and Cell Therapy 2017, Washington, DC.
4. Oral Presentation and poster presented entitled “**Pharmacokinetic and Biodistribution Studies in an Orthotopic Pancreatic Cancer Model**” in 3rd Annual Biopharmaceutical Science Symposium 2016, UNMC, Omaha NE.
5. Poster presented entitled “**Co-delivery of GDC-0449 and miR-29b1 for Treating Liver Injury and Fibrosis**” in *AAPS* annual conference 2015, Orlando FL.
6. Poster presented entitled “**Co-delivery of GDC-0449 and miR-29b1 for Treating Liver Injury and Fibrosis**” in 2nd Annual Biopharmaceutical Science Symposium 2015, UNMC, Omaha NE.
7. Poster presented entitled “**Nanomedicines of Hedgehog Inhibitor and PPAR- γ Agonist for Treating Liver Fibrosis**” in *AAPS* annual conference 2013, San Antonio TX.

SCHOLARLY ACTIVITY

As a reviewer for peer reviewed journals

Advanced Drug Delivery Reviews, Bioorganic & Medicinal Chemistry, Drug Design, Development and Therapy, Journal of Neuroimmune Pharmacology, Macromolecular Bioscience, Molecular Pharmaceutics, Molecular Therapy, and Pharmaceutical Research.

Mentorship / Training (Name, designation, activity, year)

Name	Designation	Role	Year
Yanfei Chen	Visiting Scholar	Research training	2019 - present
Jingyi Ma	Graduate Research Assistant	Research training	2018 - present
Bharti Sethi	Graduate Research Assistant	Research training	2017 - present
Bolu Yang	Visiting Summer Student	Research training	2019 - 2020
Paige Slavik	Undergraduate Summer Student	Research training	2013 - 2014
