Curriculum Vitae

DR. ARIHANT KUMAR SINGH

Email: singh117@msu.edu; arihantkumar.singh@gmail.com

Phone: +1 (517) 214 2804; +91 9033214557

Academic Profile

Ph.D. (Pharmaceutical Science): **Aug 2018 - Apr 2024**
University: Birla Institute of Technology & Science (BITS) Pilani, Pilani Campus, Rajasthan, India

M. Pharm. (Pharmaceutics): **Aug 2015 - Jan 2018**
University: Savitribai Phule Pune University, Pune, Maharashtra, India

B. Pharm. (Pharmacy): **Aug 2010 - Jul 2015**
University: Gujarat Technological University, Ahmedabad, Gujarat, India

Work / Research Experience

Post-doctoral Research Associate **Jul 2024 - ongoing**
Translational NanoImmunoEngineering Lab
Institute for Quantitative Health Science & Engineering (IQ), Michigan State University
Supervisor: Dr. Bryan R. Smith

Assistant Professor **Feb 2024 - Jun 2024**
Apeejay Stya University, New Delhi, India

Doctoral Research Experience: **Aug 2018 - Jan 2024**
BITS Pilani, Pilani Campus, Rajasthan
Supervisors: Prof. Anupama Mittal & Prof. Deepak Chitkara

Title: ***Combination delivery of C-peptide and lisofylline for the treatment of diabetic nephropathy***
Description: The research focused on designing and evaluating a novel combination formulation of C-peptide and lisofylline to prevent Type I Diabetes Mellitus-related kidney complications, diabetic nephropathy. As a strategic intervention, the synthesis anti-diabetic drug, LSF and its fatty-acid prodrugs and cationic polymers were utilized to prepare polymeric nano-complexes which were then evaluated in combination with *in-vitro* cellular studies, *in-vivo* pharmacokinetics and efficacy studies in a streptozotocin-induced diabetic nephropathy animal model.
Fellowships: DST Rajasthan, DST Nanomission and Institute fellow in BITS Pilani.
Teaching Practice: M. Pharm (Advanced Drug Delivery System & Pharmaceutical Biotechnology)
B. Pharm (Biopharmaceutics, Medicinal Chemistry-II, Physical Pharmacy, Pharmaceutical Formulation)

Research/ Industrial Trainee:

Junior Research Fellowship, DST Rajasthan, BITS Pilani — **May 2018 - Jul 2018**
Supervisor: Prof. Anupama Mittal

Nano drug delivery system, M. S. University of Baroda, Vadodara, Gujarat, India — **Jan 2018 - Apr 2018**
Supervisor: Prof. A.N. Misra

R&D Department, Serum Institute of India Pvt. Ltd., Pune, Maharashtra, India — **Feb 2016 - Mar 2016**
Supervisor: Dr. S.S. Pisal

Startup Experience:

Techpedia, Sristi Organisation, Ahmedabad, Gujarat, India (Research associate) — **Oct 2014 - July 2015**
[Startup, policy & project management]

E-Swasthya Mediserve Pvt. Ltd., Ahmedabad, Gujarat (Researcher) — **Jun 2014 - Mar 2015**
[Telemedicine startup]

Technical Skills

- Nano Technology based drug delivery system:
  - Synthesis & characterization of hydrophilic, hydrophobic and amphiphilic polymers, monomers for polymer, polymer-drug conjugates and fatty acid-based prodrugs. Design, development & evaluation of polymeric micelles & particles-based nano-formulations, liposomes, lipid-polymer hybrid nanoparticles and microparticles.
  - Carrying out Scale-up trials of lab-scale lipid nanoparticles, micelle-based nano-formulation and polymeric systems. Conducting and interpreting pre-formulation studies. Good knowledge of developmental and evaluation aspects of NDDS in delivery of small and large molecules. Familiar with conventional dosage forms (NPs loaded tablet dosage form and ointment).
- Instrumental Skills:
  - Proficiency in handling and HPLC-PDA, UV spectrophotometry, spectrofluorimeter, DSC, TGA, circular dichroism and NMR, FT-IR, zetasizer, LC-MS, gel permeation chromatography (GPC), flash chromatography, microscopy (bright field and fluorescence), SEM, etc.
  - Pharmaceutical formulations: microwave synthesizer (Monowave 400), tablet punching machine, dissolution apparatus, diffusion cell apparatus, lyophilizer (Freezone triad & benchtop), probe sonicator, ultracentrifuge and homogeniser.
- Cell Culture Skills: Basic cell culture techniques and instrument handling. DNA isolation and purification. Well-versed with Agarose and PAGE gel electrophoresis, RT-PCR, western blot techniques, immunohistochemistry, flow cytometry and ELISA.
- Animal Studies: Well-versed in planning, dosing & pharmacokinetics, biodistribution and sampling in mice and rats. Worked on developing animal models like type 1 diabetes, diabetic nephropathy, diabetic wound, SPIP perfusion study, psoriasis & tumour model.
- Software Skills: Design of Experiments (DoE), Phoenix WinNonlin, Chemdraw, Reference Management Software, NMR interpretation software (MestreNova), Flowcytometry analysis (FCS Express, CytExpert), Histopathological imaging analysis software (ImageJ), GraphPad Prism.

List of Intellectual Properties

1. Indian Patent- Formulation of peptide nano-complexes for delivery of peptide and method of preparation (Filed on 7th July 2023, 202311047523)
2. Indian Patent- Novel technique for particle detection & clarity (Filed on 28th April 2015, 1687/ MUM/2015- Under examination)
3. Indian Patent- An apparatus and a method for tracking laboratory animals (Filed on- 14th Jun 2014 144/MUM/2014, Granted on- 8th March 2022)
4. PCT Patent- A lipid-polymer hybrid nanoparticles (Filed on 2nd Feb 2020, PCT/IB2020/050819) Indian Patent- A lipid-polymer hybrid nanoparticles (201921004214, Granted on- 24th Jan 2022)

List of Publications

1. **Arihant Kumar Singh**, Kommera Sai Pradyuth, Deepak Chitkara, Anupama Mittal, Restoring Physiology Parameters of Pancreas and Kidney by Treatment with a Polymeric Nano-Formulation of C-Peptide and Lisofylline Combination in Diabetic Nephropathy *Nanoscale* (2024). *Published*
2. **Arihant Kumar Singh**, Shubham A. Salunkhe, Deepak Chitkara, Anupama Mittal, Potent anti-inflammatory and anti-apoptotic activities of electrostatically complexed C-peptide nanospheres for ameliorating diabetic nephropathy, *Biomaterial Advances* (2024) 163, 213935.

3. **Arihant Kumar Singh**, Kishan Italiya, Saibhargav Narisepalli, Deepak Chitkara, Anupama Mittal, Role of chain length and degree of unsaturation of fatty acids on physicochemical and pharmacological behaviour of drug-fatty acid conjugates in diabetes, *Journal of Medicinal Chemistry* (2021) 64, 14217-29.
4. Kommera Sai Pradyuth, Shubham A. Salunkhe, **Arihant Kumar Singh**, Deepak Chitkara, Anupama Mittal, Belinostat loaded lipid-polymer hybrid nanoparticulate delivery system for Breast Cancer: Improved Pharmacokinetics and Biodistribution in tumor model, *Journal of Material Chemistry B* (2023) 11, 10859-72.
5. Samrat Mazumdar, Saibhargav Narisepalli, **Arihant Kumar Singh**, Deepak Chitkara, Anupama Mittal, Enhanced anti-tumor efficacy and tumor accumulation of Tamoxifen through cRGD functionalized cholesterol based lipopolymeric nanoparticles for targeted breast cancer therapy, *Journal of Drug Delivery Science and Technology* (2023) 90, 1-16.
6. Kishan S. Italiya, **Arihant Kumar Singh**, Deepak Chitkara, Anupama Mittal, Nanoparticulate tablet dosage form of lisofylline-linoleic acid conjugate for type 1 diabetes: in situ single-pass intestinal perfusion (SPIP) studies and pharmacokinetics in rat, *AAPS PharmSciTech* (2021) 22, 1-12.
7. Tania Nandi, Sai Pradyuth, **Arihant Kumar Singh**, Deepak Chitkara, Anupama Mittal, Therapeutic agents for targeting desmoplasia: Current status and emerging trends, *Drug Discovery Today* (2020) 25, 2046-55.
8. Sudeep Pukale, Saurabh Sharma, Manu Dalela, **Arihant Kumar Singh**, Sujata Mohanty, Anupama Mittal, Deepak Chitkara, Multi-component clobetasol-loaded monolithic lipid-polymer hybrid nanoparticles ameliorate imiquimod-induced psoriasis-like skin inflammation in Swiss albino mice, *Acta Biomaterialia* (2020) 115, 393-409.
9. Ashutosh Tripathi, Kasturi, **Arihant Kumar Singh**, Indrajeet Chaudhary, 3D Organ Printing: A Future Prospect of Medical Science in Organ Transplantation, *Innovare Journal of Life Science* (2013) 3, 1-16.

Conferences, Seminars & Webinars

1. Oral presentation at 4th World Drug Discovery & Development Congress 2023 at IISc, Bangalore on 29th Oct 2023.
2. Presented posters at Controlled Release Society Local Indian Chapter's 20th & 21st International Symposium on Feb 2022 (Virtual) & Feb 2023 (at NMIMS, Mumbai).
3. Oral presentation at 3rd National Biomedical Research Competition (NBRCOM) 2021 (Virtual).
4. Presented poster at the Society of Biological Engineering's 6th Bioengineering & Translational Medicine Conference 2021, Newyork organized by AIChE and sponsored by Wiley on 18-20 October 2021 (Virtual).
5. Oral Cancer Symposium on Recent Advances in Diagnosis & Management of Oral Cancer in India on 24th July 2021.
6. Seminar on RSC Medicinal Chemistry Desktop Seminar Series by Royal Society of Chemistry Publishing Webinars on 30th Sept 2020.
7. Webinar on Current Regularity Guidelines & Ethical Requirement for Clinical Trials in India by Institutional Human Ethical Committee, BITS Pilani, Pilani Campus on 21st Aug 2020.
8. National Webinar on Novel Paradigms in Drug Delivery by Controlled Release Society Indian Chapter on 13th April 2023.
9. Workshop on Bio-entrepreneurship and Intellectual Property & Technology Management in Life Sciences by BIRAC & BITS Pilani on 8th Feb 2023.
10. International Conference on IMTechCon: An Industry-Acadmia Meet by CSIR-IMTECH, Chandigarh on 4-6th Oct 2017.

Awards & Achievements

1. Acceptance of abstract in **8th Nano Today Conference** in April 2023 at San Diego, CA, USA, and **ICMR travel grant awardee** for attending the same. (Not availed)

2. **Sun Pharma Science Scholar Award 2021**- Issued by Sun Pharma Science Foundation, New Delhi with a hundred thousand price money, travel grant and a citation in the field of pharmaceutical science in Jan 2022.
3. **Young Researcher Award 2021**- Issued by Society of young biomedical scientists, India at 3rd National Biomedical Research Competition (NBRCOM) 2021 in pharmaceutical science's oral presentation category with 3rd rank and ten thousand price money.
4. Awarded with **Innovative Student's Co-Creation Award for Leadership & Excellence (i-SCALE) award 2015** for founding & working "Pharma Innovators" group from 2013 GTU Innovation Council, Gujarat Technological University, Ahmedabad in Feb 2015.
5. **Special appreciation prize** from MIP, Pune for the academic year 2016-2017.
6. **Awarded** at Zonal and University level Avishkar-2016 research poster competition for the project 'Neem Gum' in January 2017 at SPPU University, Pune, Maharashtra.
7. **1st prize** in National level poster competition (Review category) titled 'Peptidomimetics' in PharmaVista 2016 at MIP, Pune, Maharashtra.
8. **1st prize** in Kalakari- Chemistry (Innovative Model Competition) with a five thousand cash prize at GTU TechFest 2014 at BITS, Vadodara, Gujarat.
9. **1st and 2nd prize** in State level Quiz and Model competition for the project on 'Modified catatonia model' at PharmaVision 2013, Mehsana, Gujarat.
10. **1st prize** in State level poster competition at PPDC, Vadodara in February 2012.

Hobbies

- Running, biking, badminton and volleyball.
- Reading and travelling.

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