

# MUKTI VATS

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## PROFESSIONAL SUMMARY

- Creative formulation developer with over half-a-decade of diverse academic experience in nano-medicine and drug-delivery, immunology, biotechnology and pharmaceutical sciences
- Expert in optimizing and characterizing nano-materials for photo-thermal therapy of solid tumors
- Experience in independently developing nano-formulations and testing them on animal models

## EDUCATION

<b>Ph.D.</b>	NanoBios Lab, IIT Bombay   Mumbai, India   September 2021
<b>M. Pharmacy</b>	Jamia Hamdard   New Delhi, India   September 2013
<b>B. Pharmacy</b>	Kurukshetra University   Kurukshetra, India   June 2009

## SKILLS

- Formulation and characterization of Nanoparticles, Hydrogels (mucoadhesive and thermosensitive gelling systems), Liposomes and Emulsions.
- FACS – Cell death Assays and Immunophenotyping
- Development of Polymeric Biosensor and spectral analysis.
- Molecular biology techniques – Protein isolation and purification, PCR, ELISA, Cloning, Plasmid/RNA/DNA isolation, Lentiviral transformation assay.
- Animal Tissue culture techniques, J774 Dual assays, isolation and maintenance of primary cells
- Animal handling and In vivo investigation techniques.
- Data analysis and interpretation.
- Photothermal therapy and NIRF imaging
- MS Office, Graph Pad, Image J, Chem draw, Origin Lab, Python, Rlab

## EXPERIENCE

- 1. Post-doctoral researcher - Rege lab at ASU, USA | June 2022 - December 2022**
- 2. Founder, Nutrenno - Singapore | May 2021 – May 2022**  
Tech founder, product building at Nutrenno (A biotech company) – Applying targeted delivery techniques for delivering nutrients in aquafeed to increase the bioavailability of expensive nutrients and reduce nutrient leaching that causes eutrophication.
- 3. Founder-in-residence - Bengaluru, India | February 2021 - April 2021**  
Founder's scholarship by Entrepreneur First (A London based VC firm)

**3. Doctoral Research Fellow**

**Indian Institute of Technology, Mumbai, India | July 2015 - September 2021**

Advisor: Prof. Rohit Srivastava (HOD, BSBE, IIT Bombay)

- Synthesis and In vivo investigation of PCL-IR820 Nanoparticles for photothermal therapy of solid tumors
- In situ gold coating of liposomes and PLGA Nanoparticles
- Synthesis, characterization of mucoadhesive and thermosensitive gels for drug loading
- To synthesize and characterize multifunctional GO-Au-PLGA nanoparticles as dental filler

**4. Doctoral Intern**

**Centre for Biomimetic Sensor Science, NTU, Sg | May 2017 - November 2017**

Advisor: Prof. Bo Liedberg

Project title: POC sensors for diagnosis of lung cancer biomarker (miR21).

Skill set: Biosensor development, spectral analysis.

**5. Doctoral Intern**

**BeANs Lab , NTU, Sg | May 2017 - November 2017**

Advisor: Prof. Sierin Lim

Project title: Development of NIR loaded E2 Protein nanocages (NIRE2) for photothermal therapy of Cancer.

Skill set: Protein extraction and purification, drug loading into protein nanocages and characterization.

**6. Junior Research Fellow**

**Immuno-engineering lab, IITB – Mumbai, India | February 2014 - May 2015**

Advisor: Dr. Rahul Purwar

Project title – Isolation of skin resident B and T cells from human skin tissue.

Skill set : Flowcytometry (FACS VERSE), Processing of human skin to isolate B and T cells, Lentiviral production, Animal tissue culture

**7. Research Intern (Master's Thesis)**

**Immuno-Biology Lab, NII – New Delhi, India | June 2012 - April 2013**

Advisor: Dr. Satyajit Rath, NII and Prof. Vidhu Aeri (HOD, Jamia Hamdard)

Project title : "To study the differences between response of the two lymphocytic lineages to pharmacological reagents (oxidative stress inducers and metabolic inhibitors)".

Skill set : Flowcytometry (FACS ARIA), ELISA, In-vitro cell death assays, Animal tissue culture, Primary mammalian cells processing for invitro assays, Cloning, Plasmid Isolation, and PCR.

**APPROVED PATENT**

'Polycaprolactone Based Plasmonic Nanoshells And Method Of Preparation Thereof',P.No.3597

**PATENT APPLICATION**

'IR820 dye conjugated Polycaprolactone Nanoparticles (PCLIR NPs) for solid tumor ablation', PAT/BS/144303004-3/19-20 (Status- with Attorney)

## PUBLICATIONS

1. **Mukti Vats**, Sumit Kumar Mishra, Mahdieh Shojaei Baghini, Deepak S Chauhan, Rohit Srivastava, Abhijit De; Near infrared fluorescence imaging in nano-therapeutics and photo-thermal evaluation; International journal of molecular sciences 18 (5), 924
2. **Mukti Vats**, Pradeep Kumar, Prabhu Raj, Rohit Srivastava; Synthesis And Characterization Of Metal-Free PCLIR NPs As Biodegradable, Efficient, And Cost-Effective Theranostic Agent For Photothermal Therapy Of Solid Tumors;(In process)
3. **Mukti Vats**, Amit Kumar, Mahadeo Gorain, Gopal Kundu, Abhijit De, Rohit Srivastava;In-Vivo Translation Of Red Photo-Emissive PCLIR NPs For NIRF Guided Photo-Therapy Of Solid Tumor;(In process)
4. Gopal Ammanath, Sanjida Yeasmin, Yuvasri Srinivasulu, **Mukti Vats**, Jamal Ahmed Cheema, Fairuz Nabilah, Rohit Srivastava, Umit Hakan Yildiz, Palaniappan Alagappan, Bo Liedberg; Flow-through colorimetric assay for detection of nucleic acids in plasma; Analytica chimica acta 1066, 102-111
5. Asifkhan Shanavas, Aravind Kumar Rengan, Deepak Chauhan, Liya George, **Mukti Vats**, Navneet Kaur, Pranjali Yadav, Purvi Mathur, Swaroop Chakraborty, Appidi Tejaswini, Abhijit De, Rohit Srivastava; Glycol chitosan assisted in situ reduction of gold on polymeric template for anti-cancer theranostics; International journal of biological macromolecules 110, 392-39
6. Deepak S Chauhan, B Pradeep K Reddy, Sumit K Mishra, Rajendra Prasad, Mukesh Dhanka, **Mukti Vats**, Gayathri Ravichandran, Deeksha Poojari, Omkar Mhatre, Abhijit De, Rohit Srivastava; Comprehensive Evaluation of Degradable and Cost-Effective Plasmonic Nanoshells for Localized Photothermolysis of Cancer Cells; Langmuir 35 (24), 7805-7815
7. Jasneet Kaur Khalsa, Amanpreet Singh Chawla, Savit B Prabhu, **Mukti Vats**, Atika Dhar, Gagan Dev, Nabanita Das, Sandip Mukherjee, Shalini Tanwar, Hridesh Banerjee, Jeannine Marie Durdik, Vineeta Bal, Anna George, Satyajit Rath, Gopalakrishnan Aneeshkumar Arimbasseri; Functionally significant metabolic differences between B and T lymphocyte lineages; Immunology 158 (2), 104-120

## ADDITIONAL INFORMATION

- Senior Research Fellowship, DST, Government of India 2016-2019
- Junior Research Fellowship, DST, Government of India 2014-2016
- Junior Research Fellowship, MHRD, Government of India 2011-2013
- Big Data Bioinformatics Proteomics hands-on workshop' 2019
- Travel grant for oral presentation at the MRS Fall' 2017 conference in Boston, USA 2017
- One among the Top 50 Students from India selected by Novartis for Bio-camp 2016
- Best team work awardee at Novartis India Bio-camp' 2016
- Won the BEST POSTER AWARD at NANOBIOTECK-2016 held at AIIMS, Delhi 2016
- TA for over 100 UG and MSc. Students, trained 4 interns on research projects. 2015
- First Rank in M. Pharm (Pharmaceutical Biotechnology) 2013
- Qualified in GPAT (Graduate Pharmacy Aptitude Test) by AICTE, New Delhi 2011
- Industrial Internship (Jagsonpal Pharmaceuticals Ltd.), B. Pharma project 2007