

REPORT

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Report on participation of the ICMR International Fellow (ICMR-IF) in Training/Research abroad.

1. **Name and designation of ICMR- IF** : Dr Jiban Jyoti Panda, Scientist D
2. **Address** : Institute of Nano Nano Science and Technology, Mohali, Punjab, India
3. **Frontline area of research in which training/research was carried out** : Cancer nanomedicine/Brain drug delivery
4. **Name & address of Professor and host institute** : Prof Uday B Kompella, Skaggs School of Pharmacy and Pharmaceutical Sciences, CU Anschutz Pharmacy and Pharmaceutical Sciences Building, 12850 East Montview Boulevard Aurora, CO 80045
5. **Duration of fellowship with exact date** : (11 months and 15 days) 03/02/2020 to 17/01/2021
6. **Highlights of work conducted** :
 - i) **Technique/expertise acquired** :

1. Synthesis of anisotropic metallic nanostructures as theranostic agents for glioblastoma
2. Characterization of the structures using techniques like electron microscopy, atomic force microscopy, super resolution confocal microscopy, light scattering based studies
- 3) culture of primary neurons and glial cells
- 4) high throughput and high content screening of nanomedicines for their delivery and efficacy in 2D cultured neurons,
- 5) 3D spheroid cultures of tumor cells and high throughput and high content screening of nanomedicine delivery and efficacy,
- 6) Development of animal models with glioblastoma multiforme (GBM),
- 7) Imaging of animal models with using noninvasive techniques following nanomedicine dosing
- 8) efficacy assessment of nanomedicines in cell culture and GBM animal model,

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9) Biochemical and molecular techniques to characterize mechanisms of tumor inhibition

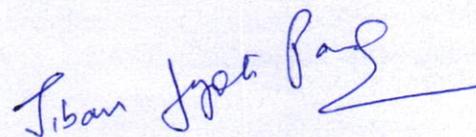
Research results, including any papers, prepared/submitted for publication:

1. Dube T, Ghosh A, Mishra J, Kompella UB*, Panda JJ*; Repurposed Drugs, Molecular Vaccines, Immune-Modulators, and Nanotherapeutics to Treat and Prevent COVID-19 Associated with SARS-CoV-2, a Deadly Nanovector, Adv Ther (Weinh), 2000172, 2020. (**Published**).
2. Dube T, Kompella UB*, Panda JJ*; Transferrin Receptor-Targeted Hybrid Anti-Cancer Peptide Functionalized Gold Nanoroses for Combined Imaging and Chemo-Phototherapy (PTT/PDT) of Glioblastoma; (**to be submitted**).
3. Chibh S, Panda JJ and Kompella UB; Self-Built Anticancer Drug Nanoparticles: In Vitro Characterization and Efficacy Analysis in a Cell Culture Model of Glioblastoma. (**to be submitted**)

The research results in the form of a manuscript draft are attached here with.

i. **Proposed utilization of the experience in India:** The expertise gained in the field of glioblastoma drug delivery as well as the expertise gained in the field the development of theranostic systems for glioblastoma will be extended to study other brain tumors. The identified peptides/small molecules inhibitors identified from the study would be extended to other molecules of similar structure and nature through mutual collaboration. Positive hits identified would be scaled up further. As Prof Kompella's laboratory is equipped with other neuronal disease models like epilepsy etc; new collaborations between my and Prof Kompella's group would be established to develop nanoformulations for many difficult to treat ocular diseases. Knowledge gained from the study would also form the basis of the development of nanoformulations towards addressing challenges of other neural disorders like Parkinson's, Alzheimer's etc.

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Signature of ICMR-IF