List of top 10 publications *(*Corresponding author) (IF= Impact Factor)*

1. A.Kalkal, S.Kadian, S. Kumar, G.Manik, P.Sen, S. Kumar* *and* **P.Gopinath***.Ti_3C_2-MXene decorated with nanostructured silver as a dual-energy acceptor for the fluorometric cancer biomarker detection. *Biosensors and Bioelectronics*, **2022, *(IF=12.6)***.
   - Synthesis of Ag@Ti_3C_2-MXene nanohybrid via a one-pot direct reduction method
   - Ag@Ti_3C_2-MXene as a dual-energy acceptor exhibits better quenching and energy transfer efficiencies in contrast to Ti_3C_2-MXene and AgNPs
   - Anti-NSE/amino-GQDs (donor) and Ag@Ti_3C_2-MXene (acceptor) based fluorescent turn-on biosensor for NSE detection
   - Biosensor reveals low LOD of 0.05 pg mL^{-1} and fast response time (12 min) in the detection range of 0.1 pg mL^{-1} to 1500 ng mL^{-1}. Also exhibit excellent performance in spiked serum samples (Avg. recovery of ~ 98%).

2. S. Jindal, S.S.Ghosh, P.Gopinath*.Core-shell nanofibre scaffold mediated co-delivery of connexin-43 gene and histone deacetylase inhibitor for anticancer therapy. *Materials Today Communications*, **2021 *(IF=3.8)***
   - Fabrication of core-shell nanofibre scaffold carrying connexin 43 (Cx43) gene in the shell layer and drug 4-phenyl butyrate (4-PB) in core layer.
   - 4-PB, a histone deacetylase inhibitor, has anti-tumor potential that also increases Cx43 expression and gap junction communication.
   - The core-shell nanofibre scaffold efficiently transfect Cx43 gene into MCF-7 cells, followed by gradual release of 4-PB for enhanced anticancer therapeutic effects.
   - The core-shell nanofibre scaffold allows therapeutic translation of Cx based combinatorial treatment.

3. A. Kalkal, R. Pradhan, S. Kadian, G. Manik, and **P.Gopinath***. Biofunctionalized graphene quantum dots based fluorescent biosensor towards efficient detection of small cell lung cancer. *ACS Applied Bio Materials*, **2020 *(IF=4.7),*** 3, 4922–4932 featured in "NATURE INDIA"
   - Synthesis of *in-situ* amine functionalized N-doped GQDs via hydrothermal method.
   - NSET based biosensor using anti-NSE/amine-N-GQDs and AuNPs as donor-acceptor pair.
   - The biosensor has been used for small cell lung cancer biomarker (NSE) detection.
   - It exhibits wide linear detection range (0.1 pg mL^{-1} to 1000 ng mL^{-1}).
   - It also exhibited good performance in spiked serum samples (Avg. recovery of 94.69%).

4. S.Uday Kumar and **P.Gopinath***. Fabrication of nanofibrous scaffold grafted with gelatin functionalized polystyrene microspheres for manifesting nano-mechanical cues of stretch stimulated fibroblast. *ACS Applied Bio Materials*, **2019 *(IF=4.7)***, 2, 5323-5339 *(Cover page of the issue)*
   - In this work, a hybrid aligned nanofibrous scaffold grafted with gelatin functionalized polystyrene microspheres has been adapted for assessing cytoskeletal dynamics and

nanomechanical property (adhesion and stiffness) of bi-axial stretch stimulated fibroblast cells.

- The nanofibrous hybrid scaffold closely recapitulates in-vivo milieu of cells and is capable of divulging bi-axial mechanical stress cycles and also transduces ensuing cellular traction forces into equivalent spatio-temporal distortions in nanofiber and polystyrene microspheres.
- The ability of the scaffold to instigate evolution of subtle cellular features like apical filopodia and invadopodia under in-vitro conditions reinstates the significance of the hybrid scaffold in understanding cell mechanobiology.
- The work clearly elucidates evolution and interaction of diverse cellular physiological features at the interface of materials, which is imperative for clinical success of implants.

5. B. Tirkey, B. Bhushan, S.Uday Kumar and **P.Gopinath***. Prodrug encapsulated albumin nanoparticles as an alternative approach to manifest anti-proliferative effects of suicide gene therapy. *Materials Science & Engineering C*, **2017**, 73, 507–515 ***(IF=8.457)***

   - In this work, a prodrug loaded albumin nanoparticles has been prepared in order to achieve its sustained release and also facilitate its uptake by cells.
   - A protein based system has been realized for the first time to deliver prodrug for cancer therapy; such protein based drug delivery system renders a scope for future clinical application.
   - Physico-chemical characterizations further validate the formation of spherical, highly monodispersed and stable nanoparticles.
   - The therapeutic efficacy of prodrug encapsulated albumin nanoparticles has been validated against transfected cells. Further, the efficient induction of apoptosis by these nanoparticles was corroborated by morphological and gene expression analysis.

6. S.Uday Kumar, B. Bhushan, and **P.Gopinath***. Bioactive carbon dots lights up microtubules and destabilises cell cytoskeletal framework - a robust imaging agent with therapeutic activity. *Colloids and Surfaces B: Biointerfaces*, **2017**, 159,662-672. ***(IF=5.8)*** featured in "**NATURE INDIA**" and "**ATLAS of Science**"

   - This work outlines facile synthesis of new class of bioactive CDs by simple one-pot hydrothermal method which demonstrates excitation dependent multicolour fluorescence.
   - Apart from inherent fluorescence, as-prepared CDs also exhibits self-targeted microtubule specific affinity and subsequently dismantles the cell microtubule framework with the passage of time.
   - These CDs by virtue of high fluorescence and microtubule destabilizing action they can simultaneously label the microtubules while mediating their de-polymerization. Thus they act as highly efficient real-time nanoprobes with exceptional theranostic potential.

7. I. Matai and **P.Gopinath***. Chemically Crosslinked Hybrid Nanogels of Alginate and PAMAM Dendrimers as Efficient Anticancer Drug Delivery Vehicles. *ACS Biomaterials Science & Engineering*, **2016**, 2,213–223. ***(IF=5.8)***

   - Hybrid nanogels of Alginate (AG) and G5.0 Poly (amido amine) (PAMAM) dendrimers were synthesized via carbodiimide chemistry for *in vitro* cancer therapy.
   - Incorporation of G5.0 PAMAM dendrimers significantly improved the structural and functional properties of AG-G5 nanogels.
   - Encapsulation of anticancer drug Epirubicin (EPI) within the AG-G5 nanogels interiors endows them with therapeutic potential.
   - Anticancer action of EPI⊂AG-G5 nanogels was validated using MCF-7 (breast cancer) cells.

8. S. Uday Kumar and **P.Gopinath***. Bioactive core-shell nanofiber hybrid scaffold for efficient suicide gene transfection and subsequent time resolved delivery of prodrug for anticancer therapy. *ACS Applied Materials & Interfaces*, **2015**, 7, 18717–18731 ***(IF= 9.5)*** featured in "**NATURE INDIA**

   - Single composite core-shell nanofiberous scaffold for subsequent delivery of suicide gene and prodrug has been realized for the first time.
   - Stable RhoB tagged DNA-bPEI polyplexes has been synthesized for tracking polyplex released from core-shell nanofiberous scaffold and its subsequent intra-cellular localization in A549 cells.
   - The cascade of events starting from suicide gene-polyplex release from nanofibers, transfection and expression of CD-UPRT suicide gene by A549, subsequent prodrug release and its metabolic conversion into toxic intermediates which finally culminates in host cells apoptosis has been monitored in real time basis in this work.
   - The therapeutic efficacy and bystander effect mediated by suicide gene therapy against A549 cells has been established in this work on qualitative and quantitative basis at both phenotypic and genotypic level.

9. I. Matai, A. Sachdev and **P.Gopinath***. Self-assembled hybrids of fluorescent carbon dots and PAMAM dendrimers for epirubicin delivery and intracellular imaging. *ACS Applied Materials & Interfaces*, **2015,**7,11423-11435 ***(IF= 9.5)***

   - Luminescent carbon dots (CDs) were anchored to G5 Poly (amido amine) (PAMAM) acetylated dendrimers via self-assembly to formulate fluorescent CD-G5-Ac hybrids.
   - Encapsulation of anticancer drug Epirubicin (EPI) in the hydrophobic dendritic interiors, imparts the fluorescent hybrids with therapeutic potential.
   - Thus, as-synthesized multifunctional CD-G5-Ac/EPI hybrids serve as a dual-emission delivery system, to track the intracellular distribution and cytotoxic effects of EPI.

- Anticancer action of CD-G5-Ac/EPI hybrids was validated using MCF-7 (breast cancer) cells.

10. I. Matai, A. Sachdev and **P.Gopinath***. Multicomponent 5-fluorouracil loaded PAMAM stabilized-silver nanocomposites synergistically induce apoptosis in human cancer cells. *Biomaterials Science*, **2015**,3,457–468 *(Cover page of the issue)* ***(IF=6.6)***

    - Development of poly (amidoamine) (PAMAM) dendrimer based multicomponent therapeutic agent for *in vitro* cancer therapy applications.
    - This is the first instance wherein, dual functionality of PAMAM dendrimer as a stabilizer to synthesize amine terminated silver nanoparticles and a delivery system for anticancer drug, 5-FU has been exploited.
    - The synergistic antiproliferative effects of 5-FU@DsAgNCs were assessed using A549 (Lung cancer) and MCF-7 (Breast cancer) model systems.
    - Mechanism of action of 5-FU@DsAgNCs has been further elucidated.