

Supplementary Table 1. Application of g-C₃N₄ in various biocompatibility studies

Nanomaterial	Assay	Pollutant degradation	Outcome	Reference
Chitosan/halloysite/g-C ₃ N ₄	Cytotoxicity-MCF-7 cell line	-	The pH-responsive targeted delivery of quercetin (QC) drug for inhibiting breast cancer therapy. The encapsulated drug molecule significantly reduces the cell viability (MCF-7) compared to free QC.	1
Starch/PVA/g-C ₃ N ₄ (hydrogels)	Cytotoxicity-MCF-7 cells	-	The treatments with the nanocomposite alone exhibit 95% cell viability, which is comparable to ISO standards. The doxorubicin-loaded hydrogels significantly promote cancer cell apoptosis.	2
Alg/ZnO-g-C ₃ N ₄	Cytotoxicity-DrG cell lines	Methylene blue	MTT and Alamar blue reduction assay assessed cell viability and cellular metabolic activity. The result shows that the optimal concentration of 300 μg/mL Alg/ZnO-g-C ₃ N ₄ did not alter the morphological appearance of the zebrafish DrG cells.	3
Starch/alginate / Cu-g-C ₃ N ₄	Antibacterial- <i>E. coli</i> and <i>S. aureus</i>	-	Integrating Cu5%-g-C ₃ N ₄ in the polymeric film-based food packaging significantly controls gram-positive (<i>S. aureus</i>) and gram-negative (<i>E. coli</i>) bacterial species.	4

			<p>Cu NPs influence the bacterial cells by affecting the structural integrity and ROS generation.</p> <p>The intrinsic properties of g-C₃N₄ increase the polymeric film's thermal stability and mechanical strength.</p>	
rGO/g-C ₃ N ₄ /FeTiO ₃	<p>Antibacterial- <i>E. coli</i> and <i>S. aureus</i></p> <p>Genotoxicity- Zebrafish</p>	<p>Malachite green and Tetracycline</p>	<p>At an optimal dose, the nanocomposites restrict bacterial growth and haven't exhibited any toxicity concerns regarding zebrafish embryo development.</p>	5
PVA/BC/g-C ₃ N ₄ /Ca/Aloe vera nanofibers	<p>Wound healing -mice</p> <p>Antimicrobial- <i>E. coli</i> and <i>S. aureus</i></p>	-	<p>The nanocomposites have the potential to heal diabetic wounds up to 95% in 21 days, compared to 57% on a Curcumin/lignin dressing.</p> <p>In addition, the nanocomposites exhibit antibacterial properties against Gram-positive and Gram-negative bacterial species.</p>	6
Zn@g-C ₃ N ₄	<p>Cytotoxicity- HeLa cells</p>	-	<p>In this opinion paper, ROS production through the amphiphilic nanocomposite inhibits cell proliferation by damaging the DNA and membrane of human cervical cancer cells.</p>	7
g-C ₃ N ₄ /PVA/Gelatin	<p>Cytotoxicity- HeLa and BHK-21 cells</p>	-	<p>The g-C₃N₄ at 1% addition in the polymer matrix significantly increases the tensile strength and thermal properties by 42% and 19.75% compared with PVA/gelatin alone.</p> <p>The study confirms that 62% of ciprofloxacin (drug) is released within</p>	8

			<p>120 min at 7.4 pH, adopting the Higuchi model.</p> <p>Biocompatibility is assessed with cytotoxicity tests on HeLa and BHK cells.</p> <p>Additionally, the nanocomposite and the drug significantly inhibited the growth of four bacterial species: <i>Bacillus subtilis</i>, <i>Staphylococcus aureus</i>, <i>Escherichia coli</i>, and <i>Pseudomonas aeruginosa</i>.</p>	
g-C ₃ N ₄	Cytotoxicity-hFOB cells	-	<p>The bone regeneration and biocompatibility were tested in this study using g-C₃N₄.</p> <p>Implantation of scaffolds in a model animal (rabbit) with critical-size bone defects has been reported to increase Osteogenesis using the g-C₃N₄ compared to graphene oxide (GO).</p> <p>Hemocompatibility was tested with hFOB cells. The results show that cells are viable and the nanomaterial is nontoxic.</p>	9

References

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