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(57) Abstract :

The present invention relates to a targeted drug delivery system for breast cancer treatment, utilizing a copper-based metal-organic framework (Cu-based MOF) synthesized from copper chloride hexahydrate and pyridine 2,6 dicarboxylic acid. The Cu-based MOF is infused with cisplatin, a widely used anticancer drug, through a simple impregnation method. The system targets explicitly breast cancer cells (MDA-MB-231), enhancing therapeutic efficacy while minimizing side effects. Key features include the Cu-based MOF's high stability and large surface area, enabling efficient drug encapsulation and controlled release. The invention offers a novel, effective, and safer alternative for cancer therapy, significantly improving traditional chemotherapy by reducing systemic toxicity and improving patient outcomes. This innovative approach is scalable, cost-effective, and adaptable for various cancer treatments.

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