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ORIGINAL ARTICLE

Facile construction of gefitinib-loaded zeolitic imidazolate framework nanocomposites for the treatment of different lung cancer cells

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Abstract

Gefitinib (GET) is a revolutionary targeted treatment inhibiting the epidermal growth factor receptor's tyrosine kinase action by competitively inhibiting the ATP binding site. In preclinical trials, several lung cancer cell lines and xenografts have demonstrated potential activity with GET. Response rates neared 25% in preclinical trials for non-small cell lung cancer. Here, we describe the one-pot synthesis of GET@ZIF-8 nanocomposites (NCs) in pure water, encapsulating zeolitic imidazolate framework 8 (ZIF-8). This method developed NCs with consistent morphology and a loading efficiency of 9%, resulting in a loading capacity of 20 wt%. Cell proliferation assay assessed the anticancer effect of GET@ZIF-8 NCs on A549 and H1299 cells. The different biochemical staining (Calcein-AM and PI and 4′,6-Diamidino-2-phenylindole nuclear staining) assays assessed the cell death and morphological examination. Additionally, the mode of apoptosis was evaluated by mitochondrial membrane potential ($\Delta\psi$m) and reactive oxygen species. Therefore, the study concludes that GET@ZIF-8 NCs are pledged to treat lung cancer cells.

CONFLICT OF INTEREST STATEMENT

No potential conflicts of interest were reported by the author(s).

DATA AVAILABILITY STATEMENT

Data sharing does not apply to this article, as no data sets were generated or analyzed during the current study.