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(57) Abstract :
The present invention discloses a novel synthetic molecule with potent cytotoxic activity against lung adenocarcinoma. The compound, N'-(3,4-dimethoxybenzylidene)-4-(1H-pyrrol-1-yl)benzohydrazide, features a unique structure comprising an imine group flanked by a pyrrole-substituted benzene ring and a dimethoxy-substituted benzene ring. The invention provides a detailed three-step synthetic route for preparing the compound, involving the formation of ethyl 4-(1H-pyrrol-1-yl) benzoate, its conversion to 4-(1H-pyrrol-1-yl)benzohydrazide, and final condensation with 3,4-dimethoxybenzaldehyde. The compound's structure was confirmed through comprehensive spectroscopic analysis, including IR, 1H-NMR, 13C-NMR, and mass spectrometry. In vitro studies using MTT assay demonstrated significant cytotoxicity against A549 lung adenocarcinoma cells, with an IC50 value of 34.58 µM/ml. The compound's novelty was established through a structural search in the PubChem database. This invention contributes to cancer drug discovery by providing a new lead molecule with potential for further optimization and development as an anticancer therapeutic

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