

Abstract EN

The purpose of this study was to screen for novel synthetic inhibitors of interleukins IL-6 and IL-8, which are promising targets for cancer therapy. Small molecules are an attractive approach to inhibit these signalling pathways, which are known to be important for tumour cell growth and survival. The study aimed to discover new inhibitors of IL-6 and IL-8 signalling pathways by screening a small library of chemical derivatives, including π -expanded naphthalimide derivatives, Tröger's base, and pentamethinium derivatives. The structures of the compounds were designed based on *in silico* studies focusing on blocking the IL-6 and IL-8 signalling pathways.

The study involved the use of various analytical and bioanalytical methods for the *in vitro* analysis of new potential anticancer drugs. The compounds were tested for cytotoxicity and their effect on cell growth using an MTT proliferation assay. Their antitumor activity was observed in NU/NU mice. The invasiveness of the cells was monitored using the wound healing assay. Live cell imaging was used to detect the distribution of the substances at the intracellular level. Other methods such as ELISA, microscale thermophoresis, and *in silico* predictions have been used to determine the selectivity of inhibitors of the signalling pathways IL-6 and IL-8. Absorbance and fluorescence features of the compounds were also generated, and all results were analysed using GraphPad Prism 8.0.1 (GraphPad Software, Inc., La Jolla, USA) and ImageJ 2.9.0 (ImageJ, National Institutes of Health, Bethesda, Maryland, USA) software.

This study highlights the importance of small molecules as potential inhibitors of IL-6 and IL-8 signalling pathways, which play a critical role in acute inflammation and tumour disease. The study provides a comprehensive analysis of new potential anticancer drugs, utilising various analytical and bioanalytical methods, and provides valuable insights into the development of novel cancer therapies targeting IL-6 and IL-8 signalling pathways.

Keywords: [IL-6 signalling pathway inhibitors, IL-8 signalling pathway inhibitors, cytostatic]