chemistry
biology

Fluorescent isothiocyanate derivatives with anticancer and diagnostic potential

About the solution

The invention concerns fluorescently labelled sulforaphane derivatives based on a 4,7,10-trioxa-13-tridecane chain bearing an isothiocyanate group responsible for anticancer activity. The fluorophore attached via a nitrogen atom enables real-time visualisation of compound distribution in cancer cells.
The derivatives demonstrate strong cytotoxic effects against prostate and breast cancer cells while remaining non-toxic to healthy fibroblasts. They rapidly enter cells, accumulate predominantly in mitochondria and exhibit prolonged intracellular retention.
Control analogues lacking the isothiocyanate group show no biological activity, confirming its essential role. The fluorescent label allows monitoring of intracellular localisation, accumulation kinetics and clearance dynamics.
The technology integrates features of a potential anticancer therapeutic and an advanced research tool for studying cellular mechanisms.

Technology readiness level

TRL 4 - Technology validated in laboratory conditions.

Research Team

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IP Protection

The invention is protected by a patent application in the Polish Patent Office under the number: **P.445727**

Applications:

- Development evelopment of dual-function anticancer agents for therapy and imaging,
- Real-time analysis of drug uptake and retention,
- Testing targeted therapies requiring cellular-response visualisation.

Cooperation opportunities:

- Providing compound sets for oncology-focused screening,
- Collaboration on cell models for drug-transport studies,
- R&D partnerships in molecular therapy development.

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