

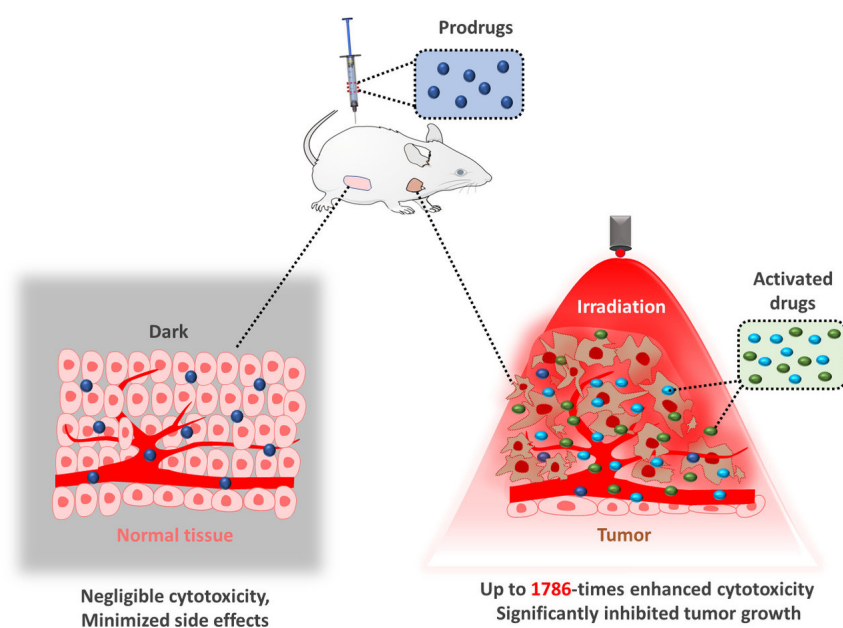
Photo-activatable Platinum(IV) Prodrug, Preparation Thereof and Therapeutic Use Thereof



Health & Wellness

Biomedical and Genetic Engineering

Others



IP Status

Patent granted



Technology Readiness
Level (TRL) ?

4

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Figure 1. Illustration of the action mode of the as-invented photoactivatable prodrugs. The prodrugs have controllable activation property: they are inert in the dark and show negligible toxicity, but under irradiation, the prodrugs are reduced to active platinum drugs. One of the leading prodrugs displays up to 1786 times higher phototoxicity than that of oxaliplatin, a clinically approved platinum drug, in human carcinoma cells, and it also inhibits tumour growth in vivo.

Opportunity

Platinum-based anticancer drugs such as cisplatin are extensively used in chemotherapy regimens to treat various types of cancer. Currently, more than 50% of cancer patients are prescribed platinum-based anticancer medication. However, there are many serious problems with such drugs, including toxic side effects and a high risk of developing drug resistance. It is urgently necessary to identify novel anticancer agents that offer a safer and more efficacious alternative to clinical chemotherapeutic drugs, especially for patients who have already developed chemoresistance.

Follow-on
Funding

Proof
Concept

Build Value

Technology

Researchers have identified a novel class of anticancer drug, activated by red light, that is highly effective in killing human cancer cells and may overcome the problems associated with platinum-based chemotherapy drugs, especially drug resistance. These novel photoactivatable “prodrugs” can be used on their own, combined with other types of anticancer drugs, or delivered by a drug carrier for cancer treatment. The invention covers not only the preparation of the photoactivatable compounds and their inhibitory activities against tumor cell growth but also a pharmaceutical composition comprising at least one photo-activatable prodrug and a type of drug carrier.

Advantages

- The novel class of prodrug, which is non-chemotherapeutic, is expected to overcome the major problems associated with platinum-based anticancer drugs, especially drug resistance and toxic side-effects.
- The novel anticancer complexes are highly effective in inhibiting human tumor growth, whereas chemotherapeutic agents like cisplatin can quickly become ineffective due to drug resistance.
- Unlike existing anticancer drugs, the novel prodrugs are photoactivatable – they can be simply and easily activated by red light.

Applications

- Development of safer and more effective pharmaceutical treatment for patients with various types of cancer, especially those who have already developed resistance to platinum-based drugs
- Likely to be in particularly high demand in mainland China, where the number of cancer patients is rapidly rising.
- Top pharmaceutical companies such as Merck & Co. Inc., Bayer Healthcare Co. Ltd., Pfizer Inc., Johnson & Johnson, Sanofi, GlaxoSmithKline, AstraZeneca, Roche, Lilly, and Guangzhou Pharmaceutical Holdings Ltd. may be interested in the invention.

