

Chlorin Conjugates for Photodynamic Chemotherapy for Triple-Negative Breast Cancer

Chlorin photosensitizers synergize with standard chemotherapies to sensitize TNBC, lower doses, and trigger mitotic catastrophe.

Researchers at Purdue University have developed a novel photosensitizer as a chemotherapeutic against triple negative breast cancer (TNBC). TNBC is the most prevalent form of cancer found in women and is considered the most aggressive form of breast cancer, comprising 15-20% of breast cancer cases. Current standard treatment for TNBC utilizes traditional chemotherapies. Unfortunately, traditional chemotherapies have high toxicity and often result in cancers with drug resistance. This has led to a dire need to discover novel treatments.

Purdue researchers have developed photosensitizers as a co-therapy with current chemotherapies. These compounds at 100 nanomolar were able to generate synergistic activity against TNBC cells with Taxol, Cisplatin, Fluorouracil, or Methotrexate. Furthermore, researchers discovered that the mode of action for the death of TNBC cells is mitotic catastrophe with slight autophagy. Combinational therapy with these photosensitizers not only shows a decrease in cell viability but the dosage of the chemotherapeutic is also reduced.

Technology Validation: This technology has been validated using a transmission electron microscope, fluorescence microscopy, and MTT assay. These methods demonstrated that the novel photosensitizer works synergistically with known chemotherapeutics and identified the mode of cell death.

Advantages:

- Known mechanism of death
- Reduced chemotherapy dosage

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Category

Pharmaceuticals/Drug Discovery
& Development
Digital Health & Medtech/AI in
Medical Imaging
Biotechnology & Life
Sciences/Oncology Tools & Cell
Modeling

Further information

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-Sensitize cancer cells to known chemotherapeutics

Applications:

-Triple negative breast cancer

-Chemotherapeutic

-Cancer therapy

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