Small-Molecule Cyclin D1 Ablative Agents for Breast Cancer Therapy

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Technology description

The Need

Cyclin D1 represents an important downstream effector of diverse proliferative and transforming signaling pathways. In mammary cells, transcriptional activation of Cyclin D1 leads to G1/S phase progression and increased proliferation. Cyclin D1 overexpression has been implicated in oncogene-induced mammary tumorigenesis. Interestingly, Cyclin D1 can act as an independent activator of estrogen receptor alpha, and overexpression confers resistance to antiestrogens in breast cancer cells and a negative predictive factor of tamoxifen response. Therefore, Cyclin D1 may be an attractive target for cancer therapy, especially breast cancer.

The Technology

The Ohio State University researchers, led by Dr. Ching-Shih Chen, developed a new class of small-molecule cyclin D1 ablative agents based on troglitazone (TG) that repress intracellular cyclin D1 levels. Cyclin D1 plays a pivotal role in malignant transformation and is overexpressed in many types of cancers including breast, colon adenocarcinomas, and squamous carcinomas of the head and neck. Particularly, cyclin D1 overexpression is present in over 50% of primary breast carcinomas, correlating with poor prognosis. Cyclin D1 compounds present a unique opportunity to specifically target the underlying mechanisms of tumorigenesis and proliferation in a wide variety of cancers.

Institution

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