

Vitamin D Analogs "1D-QM" and "1D-QMS" for Cancer, Bone Disease Therapy

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Technology description

The hormonally active form of vitamin D, known as calcitriol or 1,25 dihydroxyvitamin D₃, has shown promise for treating diseases ranging from osteoporosis to cancer to psoriasis. However, the hormone mobilizes calcium from bones and increases intestinal absorption of dietary calcium. Effective therapeutic concentrations can lead to hypercalcemia; a condition characterized by elevated blood calcium levels, alterations in mental status, muscle weakness and calcification of soft tissues and organs such as the heart and kidneys. Therefore, a need exists for new compounds that provide desirable therapeutic effects without causing dose-limiting hypercalcemia. UW–Madison researchers have developed vitamin D analogs (20S) and (20R)-25-hydroxy-2-methylene-vitamin D₃. In vivo, these compounds could act as prodrugs since 1-hydroxylation can occur in a regulated manner and extended vitamin release activity is predicted. The compounds exhibit high binding affinity and cell differentiation activity, suggesting anticancer properties. Also, high calcemic activity may be harnessed for bone disease treatments in which less frequent doses are preferred, like senile osteoporosis. The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing vitamin D analogs with extended release activity that may be useful in the treatment and prevention of cancers and bone diseases.

Application area

Prodrug use

Therapy for bone diseases, osteoporosis and low bone turnover

Prevention and treatment of leukemia, skin cancer, breast cancer, colon cancer, osteosarcoma and prostate cancer

Advantages

Pronounced anticancer, antibone disease activities

Longer compound half-life

2EG-S is at least 10 times more potent than the native hormone in releasing bone calcium stores.

Easily synthesized

Can be administered in many forms

Institution

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