Crystallized Vitamin D Compound Known as "20DCM"

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Technology description

The hormonally active form of vitamin D, known as calcitriol or 1,25 dihydroxyvitamin D_3, 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 non-calcemic compounds that provide desirable therapeutic effects without causing dose-limiting hypercalcemia.

UW–Madison researchers previously developed a vitamin D analog, 1α-hydroxy-20-methyl-2-methylene-19,24,25,26,27-pentanorvitamin D_3, also known as 20DCM, which binds the vitamin D receptor with slightly less affinity than the native hormone. 20DCM shows little to no activity on intestinal calcium transport and bone calcium mobilization as compared to vitamin Din vivo, making it less likely to cause hypercalcemia. However, it must be purified before it can be used as a pharmaceutical. UW–Madison researchers now have developed a method of using ethyl formate or an ethyl formate and hexane mixture to crystallize 20DCM. This efficient process removes most of the contaminants from the synthetic 20DCM, resulting in a highly pure product.
The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of crystallizing a vitamin D analog known as 20DCM to provide a highly pure compound for pharmaceutical use.

Application area

Production of highly pure 20DCM for use as a pharmaceutical

Advantages

Process yields highly pure 20DCM.
Crystallization process occurs easily and efficiently.
Solvent mixture is easy to remove.
Precipitated crystals are large enough to be recovered via filtration or other means.
20DCM is less likely to cause dose-limiting hypercalcemia than calcitriol.

Institution

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