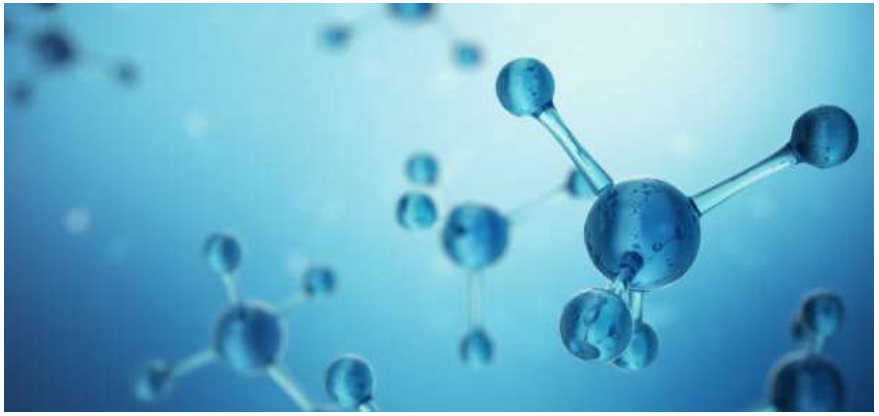
Technology Offer CSIC/XA/016

Compounds for local and temporarily restricted activation of Vitamin D receptor



Compounds useful as reversible light-regulated agonists for activation of Vitamin D receptor (VDR) using wavelengths suitable for phototherapy, that would avoid the appearance of secondary effects, with application for the treatment of diseases that involve an alteration of the VDR function.

Intellectual Property

European priority patent application filed

Stage of development

In vivo proof of concept in a psoriasis mouse model

Intended Collaboration

Licensing and/or co-development

Contact

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Market need

Vitamin D receptors (VDR) are widely expressed and regulate the transcription of genes involved in important human physiological responses. Several studies have pointed to the beneficial effects of VDR activation for autoimmune diseases and to treat cancer, among other indications. VDR also regulates the metabolism of calcium and clinical applications are therefore limited by the appearance of deregulations in patients treated with these drugs. Although new advances have allowed for the development of candidates with lower calcemic effects, the degree of separation between beneficial action and calcium-boosting is still insufficient to treat conditions such as osteoporosis, cancers, leukaemias, and severe psoriasis.

Proposed solution

Highly potent light-regulated Vitamin D receptors agonists that can selectively activate this receptor through modulation of both affinity and efficacy. This compounds may have application for the treatment of diseases where the alteration of the VDR function has been involved, such as skin diseases, autoimmune diseases, cancer, disorders of calcium metabolism, neuromuscular disorders, and cardiovascular diseases.

Only the light-activated compounds produce robust anti-inflammatory responses in a psoriasis mouse model, with full antipsoriatic activity upon illumination with non-phototoxic visible blue light and reversibility with green light.

Competitive advantages

- The compounds are fully inactive in the dark and can be selectively activated with light where and when needed.
- This new strategy opens the way to the use of light to focus the drug activity on the VDR at the localization where the pathology is present, preventing adverse effects in other tissues or even at the systemic level, such as hypercalcemia or hypercalciuria.