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Sommario/riassunto

The main physiological actions of the biologically most active metabolite of vitamin D, 1a,25-dihydroxyvitamin D3(1a,25(OH)2D3), are calcium and phosphorus uptake and transport and thereby controlling bone formation. Other emergent areas of 1a,25(OH)2D3 action are in the control of immune functions, cellular growth and differentiation. This fits both with the widespread expression of the VDR and the above described consequences of vitamin D deficiency. Transcriptome-wide analysis indicated that per cell type between 200 and 600 genes are primary targets of vitamin D. Since most of these genes respond to vitamin D in a cell-specific fashion, the total number of vitamin D targets in the human genome is far higher than 1,000. This is supported by the genome-wide view on VDR binding sites in human lymphocytes, monocytes, colon and hepatic cells. All genomic actions of 1a,25(OH)2D3 are mediated by the transcription factor vitamin D receptor (VDR) that has been the subject of intense study since the 1980’s. Thus, vitamin D signaling primarily implies the molecular actions of the VDR. In this research topic, we present in 15 chapters different perspectives on the action of vitamin D and its receptor, such as the impact of the genomewide distribution of VDR binding loci, ii) the transcriptome- and proteome-wide effects of vitamin D, iii) the role of vitamin D in health, iv) tissue-specific functions of vitamin D and v) the involvement of vitamin D in different diseases, such as infections, autoimmune diseases, diabetes and

different types of cancer.