

**Topic: breast cancer**

**THE QUESTION OF THE VITAMIN D PATHWAY: VITAMIN D RECEPTOR POLYMORPHISMS OR SERUM LEVELS AS KEY DRIVERS OF BREAST CANCER DEVELOPMENT?**

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**Abstract**

As total Vitamin D levels are often lower in black than in caucasian Americans, blacks are frequently classified as vitamin D-deficient. To fully evaluate African vitamin D status, other factors should be considered, such as vitamin D blood carrier Vitamin D-binding protein (DBP), and Vitamin D receptor (*VDR*) and *DBP* polymorphisms, whose allelic distribution can modify the degree of the vitamin D pathway activation. A prospective study on a Caucasian Italian and an indigenous black Tanzanian population was performed, including 50 healthy donors from both populations, and 35 Caucasian and 18 African breast cancer patients. 25(OH)D and DBP serum levels were analyzed by immunoenzymatic assays. A1012G, Cdx2 and Fok1 *VDR* polymorphisms and *DBP* polymorphisms were genotyped by real-time PCR. Vitamin D and DBP levels were lower

in Africans healthy donors than in Caucasians. Africans had a significant higher frequency of AA and CC for Cdx2 and Fok1 polymorphism, respectively. These allelic variants were related to a higher transcription of *VDR* gene and a higher activity of VDR receptor.

Our study reported data on the vitamin D pathway of native African populations, providing a comprehensive picture of the vitamin D pathway activity. According to the polymorphism distribution, Africans are provided with innate higher levels and higher activity of VDR. We finally hypothesized that the empowering of the vitamin D pathway could have a protective role in the development of breast cancer in the African population.