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**(57) Abstract :**

The present invention relates to a low cost biosensor based device for detection of vital nutrients, comprising of, a sample strip (1), a sample loading region (2); and a processing module, wherein, the sample strip (1) is a nano-structured sample strip having a large area that increase the absorption efficiency of the strip (1) and a plurality of testing region (3) over which a user has to pour a sample, in which each the testing region (3) is chemically coated, the sample loading region (2) is manufactured over the testing region (3) to avoid mixing of sample, thereby increasing the accuracy of said device; and the processing module includes a camera for capturing an image of the sample that reacts with said chemically coated testing strip (1), a microprocessor for analysing said image to detect a set of concentration levels of vital nutrients.

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