Salivary optical sensor implemented by the lateral coupling of a side-emitting optical fiber and a fluorescent optical fiber integrated into an intra-oral device

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Summary:
This invention refers to a distributed salivary sensor for the detection of salivary compounds (e.g. advanced glycation products), implemented around the optical coupling of a side-emitting optical fiber (1) and a fluorescent optical fiber (2), and integrated into an intra-oral device (4). The sensing technique is based on the fact that the analyte, interposed in-between the two fibers on the sensing area (6), filters the light radiation that is coupled from the side-emitting fiber (1) into the fluorescent fiber (2) and consequently changes the emission spectrum of the fluorescent optical fiber (2): gain, attenuation or the coupling of new spectral components.

Diagram of the salivary optical sensor

Integration into an intra-oral device (4)

Testing of the prototype

Description:

The technical problem solved by this invention is distributed salivary sensing performed with optical means, without the binding step of the analyte using a chromophore. Thus, our invention adopts a label-free sensing technique that exploits the potential of body fluids to alter the spectral parameters of the light coupled from the side-emitting fiber (1) into the fluorescent optical fiber (2).

Our invention has a preventive role because our goal is to detect the presence of salivary compounds as bio-marker markers of disease, but also a method of dispensarization of patients to evaluate the effectiveness of applied therapies.

Acknowledgement: The activity was supported by COFUND-ERA-HDHL ERA-NET Project, European and International Cooperation - Subprogram 3.2 - Horizon 2020, PNCDI III Program - Biomarkers for Nutrition and Health – “Innovative technological approaches for validation of salivary AGEs as novel biomarkers in evaluation of risk factors in diet-related diseases” (SALIVAGES), no 25/1.09.2017.