Towards quantitative and rapid testing of salivary cortisol for stress management

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Chronic stress is an increasing burden in our society with major health and economic impact. The percentage of the population reporting insufficient resources to face their sources of stress is continuously growing: 25.4 % in 2016, 27.1 % in 2018 and 29.6 % in 2020. Chronic stress has a considerable impact on health by increasing the risk of developing pathologies such as diabetes, heart illnesses, cancers and burn-out. In Switzerland it is estimated that the healthcare costs caused by chronic stress amount to 30 billion CHF per year. Chronic stress also has an economic impact: Induced losses for Swiss companies are estimated to be 7.6 billion in 2020. Easy-to-use tools to monitor chronic stress would be very helpful to support individual and collective stress management programs. However, while nowadays numerous solutions for the monitoring of instantaneous stress exist such as health watches, analysis of chronic stress is still assessed via the cumbersome quantification of salivary cortisol in central laboratories.

We have initiated a project aiming at providing an easy-to-use instrument for the individual assessment of chronic stress levels using a quantitative lateral flow immunoassay (LFA) for salivary cortisol. Stringent requirements in terms of sensitivity and reproducibility are planned to be met by using fluorescence detection, by a systematic analysis and reduction of the manufacturing variability and by the development of normalization and analysis tools. A compact and easy-to-use fluorescence reader for quantitative analysis of LFA is also under development. We will present our most recent results in the development of this novel LFA.