SALIVATEC
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SalivaPrint – A tool for patient stratification in oral health

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Introduction

It is known that saliva reflects many systemic and oral pathologies (Rosa *et al* 2012). At SalivaTec we are interested in using this fluid in diagnostics and patient stratification and have been analyzing saliva from several individuals characterizes as to their oral and systemic health.

Goals: Demonstrate that total salivary protein profile determined by capillary electrophoresis (SalivaPrint) may be used to direct the search for biomarkers.

Methods

SalivaPrints were obtained for **26 individuals** with **periodontal disease**. These total salivary protein profiles were obtained through automated microfluidic Experion electrophoresis system (Bio-Rad, PT).

Individuals included participate in a larger study relating oral health with different systemic factors and are volunteers from a group of seniors participating in and exercise program of the Município de Viseu. Their profiles were compared with **SalivaPrints** from **healthy individuals** and the most representative features for separation of the two groups were selected.
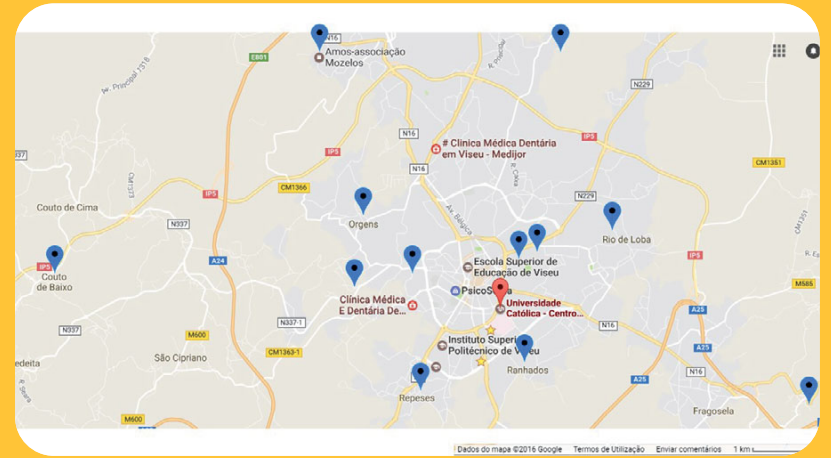
Figure 1. Data and saliva collection locations spanning 12 locations in the Viseu district
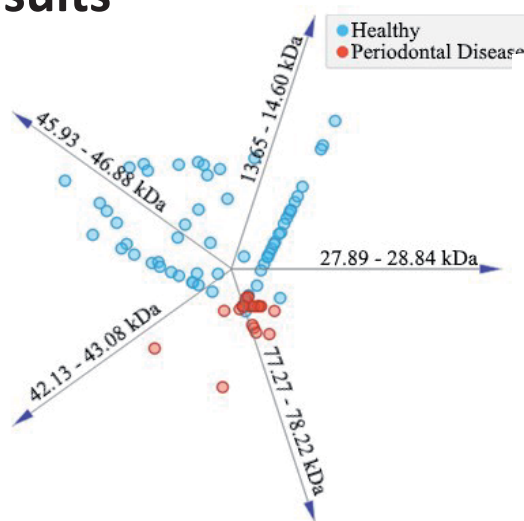
Results

Figure 2. Molecular weight ranges (kDa) contributing to discrimination of health *vs.* periodontal disease.

Table I. Proteins and respective molecular weights in SalivaPrint (Rosa *et al* 2016)

Entry	Protein names	Molecular Weight (kDa)	SalivaTecDB condition identification	Molecular Weight Range (kDa)
P31947	14-3-3 protein sigma	28	Periodontitis/ Healthy	28 - 29
P06870	Kallikrein-1	29	Healthy	
P30740	Leukocyte elastase inhibitor	43	Healthy	42 - 43
Q08188	Protein-glutamine gamma-glutamyltransferase E	77	Healthy	77 - 78
P02788	Lactotransferrin	78	Periodontitis/ Healthy	

Five molecular weight ranges of SalivaPrint seem to be important to separate the individuals with periodontal disease from the healthy individuals. These molecular weight ranges (28-29, 42-43, and 77-78 kDa) have been shown to include several proteins presented in Table I (Rosa et al 2016).

Figure 3. Metabolic pathway of mTOR, related with the glucose regulation (insulin resistant, diabetes and obesity). Adapted from Kegg

Some of these proteins are functionally related to processes deregulated in oral and systemic disease.

Proteins such as P31947 (14-3-3 protein sigma) are related to the mTor pathway involved in **glucose resistance**, a condition related to **obesity** and **diabetes**. This is consistent with a **high prevalence of these pathologies in the individuals with periodontal disease included.**
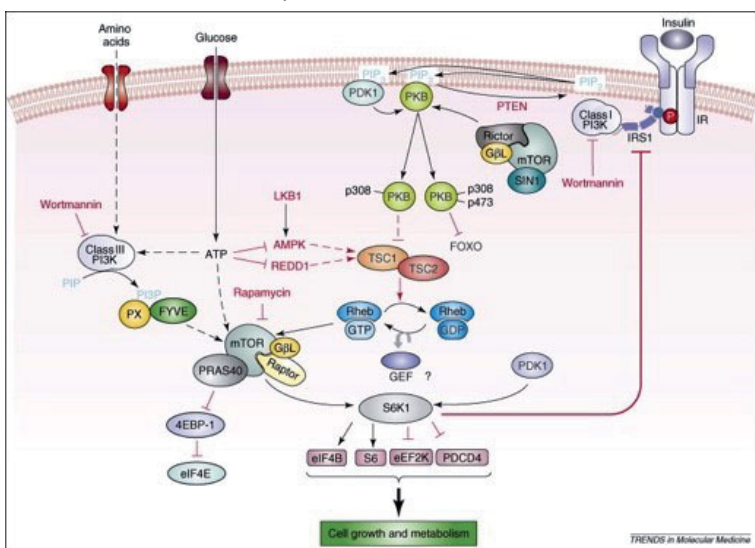
Conclusion

SalivaPrint can provide information on which molecules should be used to distinguish between individuals with oral health and periodontal disease.

Although the diagnostics of periodontal disease through salivary markers is an interesting approach, explored by our laboratory, the results presented here indicate that metabolic deregulations such as diabetes and obesity have to be considered if the quantification of salivary markers is to be used for diagnostics.

Referências bibliográficas

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Rosa N, Marques J, Esteves E, Fernandes M, Mendes VM, Afonso Â, et al. Protein Quality Assessment on Saliva Samples for Biobanking Purposes. Biopreserv Biobank [Internet]. 2016 Aug;14(4):289–97.