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The subgingival microbiomes in periodontitis and health of individuals with rheumatoid arthritis and at risk of developing rheumatoid arthritis

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ABSTRACT

Serum anti-citrullinated protein antibodies (ACPAs), present in 70% of people with rheumatoid arthritis (RA), can be detected ≤ 10 years before the onset of clinical disease. RA and periodontitis are epidemiologically associated and we have reported a high incidence of periodontitis in people who are ACPA+ and at risk of RA. Periodontal bacteria may contribute by multiple routes to the generation of RA-autoantibodies. This study aims to characterise the subgingival microbiomes from periodontitis and health in individuals with/without RA and at risk of RA.

Forty-five ACPA+ no RA (RA-at-risk; RAR), 31 healthy controls (HC) and 30 ACPA+ RA patients (RA) underwent a periodontal examination. DNA from subgingival plaque from healthy and deep pocket sites were paired-end sequenced using the Illumina HiSeq3000 and data analysed using MG-RAST + DESeq.

Metagenomes in RA samples had high proportions of Actinobacteria; RAR microbiomes contained higher proportions of Bacteroidetes than HC. The relative abundance of *P. gingivalis* was high in periodontitis and RAR; *Aggregatibacter actinomycetemcomitans* was detected with similar frequency in each group. Other bacteria implicated in periodontitis and/or autoantibody generation (*Filifactor alocis*, *Prevotella* spp, *Leptotrichia* spp.) were detected. Analyses are on-going to elucidate the diversity and functional potential of the subgingival microbiome associated with RA.