

Oral Presentations**Day 1 – 31st March 2023****O1****- Molecular & Immunological approaches in oral inflammatory diseases: a bridge to precision medicine**Karina Mendes^{1,2}, Ana T. P. C. Gomes^{1,2}, Marla Pinto², Tiago Marques^{1,2}, Maria Correia^{1,2}, Nuno Rosa^{1,2}¹ Universidade Católica Portuguesa, Center for Interdisciplinary Research in Health, Lisboa, Portugal; ² Universidade Católica Portuguesa, Faculdade de Medicina Dentária, Viseu, Portugal**Correspondence:** Karina Mendes (kmendes@ucp.pt)*BMC Proceedings 2023, 17(9):O1*

Oral infections are caused by diverse bacterial, viral and fungal pathogens, which in many cases are associated with a negative impact on patient's QoL. Indeed, infections trigger an immune response to respond effectively to a pathogen that can result in inflammatory diseases within the oral cavity.

In this context, periodontitis, the most common chronic inflammatory disease of human is caused by interactions between periodontopathic bacteria, host immune responses and environmental factors (e.g. smoking), representing a major burden on healthcare. Thus, it is important to gain further insight about molecular mechanisms involved in periodontitis development and progression into different stages (I, II, III and IV) and grades (a, b and c), a new classification scheme proposed in 2018.

Several signaling pathways have been implicated in periodontitis like MAPK Mitogen-activated protein kinases, nuclear factor kappa B (NF-κB), Janus kinase (JAK)-signal transducer and activator of transcription (STAT), TAM receptor tyrosine kinases (RTKs) and the Wnt pathway. However, studies performed in saliva and associating most of these signaling pathways with human periodontitis pathogenesis and severity are limited.

Because of that, its essential to identify and quantify specific biomarkers related to these signaling pathways at distinct stages of periodontitis, as a potential tool to support prognosis and clinical management of periodontitis cases, contributing towards a Predictive, Participatory, Preventive, and Personalized medicine.

In this work, a pilot study including molecular data generated from saliva samples of patients diagnosed at different stages of periodontitis will be presented, inferring about the involvement of specific signaling pathways in human periodontitis progression.

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O2**- Validation of salivary biomarkers for Inflammatory Bowel Disease diagnosis and monitoring**Ana T. P. C. Gomes^{1,2}, Pedro Pereira², Rúben Martins², Karina Mendes^{1,2}, Maria Correia^{1,2}, Nélio Veiga^{1,2}, Pedro Lopes^{1,2}, Cláudio Rodrigues³, Paula Ministro³, Nuno Rosa^{1,2}¹ Universidade Católica Portuguesa, Center for Interdisciplinary Research in Health, Lisboa, Portugal; ² Universidade Católica Portuguesa, Faculdade de Medicina Dentária, Viseu, Portugal; ³ Department of Gastroenterology, Tondela-Viseu Hospital Centre, Viseu, Portugal**Correspondence:** Ana T. P. C. Gomes (apgomes@ucp.pt)*BMC Proceedings 2023, 17(9):O2*

Inflammatory bowel disease (IBD) is a chronic inflammatory disorder of the gastrointestinal tract with a rising incidence worldwide, imposing a considerable burden on health services. IBD etiopathogenesis

of is partly understood and includes both genetic and environmental factors which induce an abnormal immune response. The disease can be present 2 forms: Crohn's disease (localized in the terminal ileum affecting all layers of the intestine) and ulcerative colitis (localized in the rectum and the colon and limited to the mucosa). The guidelines for IBD diagnosis in adults require a comprehensive physical examination and a review of the patient's history. Various tests, including blood tests, stool examination, endoscopy, colonoscopy, biopsies, and imaging studies help exclude other causes and confirm the diagnosis.

Colon biopsy and blood samples represent a powerful source of novel biomarkers supporting differential diagnosis. In addition to their potential in diagnosis, novel biomarkers such as miRNAs, inflammatory biomarkers, fecal and mucosal microbiota may play a critical role in predicting therapeutic efficacy as well as disease recurrence and severity.

The identification, quantification and/or validation of biomarkers is primarily performed in tissue, blood and fecal samples but only few studies have been done with saliva, which reflects the same type of biomarkers, allowing a noninvasive sample collection.

In this work, an extensive oral characterization, and the quantification of salivary biomarkers such as calprotectin and total bacterial load from IBD patients recently diagnosed and/or undergoing biological therapy were evaluated. Our preliminary results showed an increased periodontitis predisposition, and an increased salivary calprotectin and total bacterial load in those patients. These results open new perspectives to improve the understanding of the potential of saliva as a powerful tool to evaluate IBD progression/therapeutic success and generates molecular data supporting the use of saliva in diagnosis, prognosis and disease/treatment monitoring towards a Predictive, Preventive, and Personalized medicine.

This work has been approved by the Comissão de Ética para a Saúde of Universidade Católica Portuguesa (project CES133 – Microbioma Oral Humano).

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O3**- Targeting lysosomal proteases for a host-directed therapy for tuberculosis**David Pires^{1,2}¹ Universidade Católica Portuguesa, Católica Medical School, Center for Interdisciplinary Research in Health, Rio de Mouro, Sintra, Portugal; ² Instituto de Investigação do Medicamento - iMed.UlLisboa, Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal**Correspondence:** David Pires (dpires@ucp.pt)*BMC Proceedings 2023, 17(9):O3*

Tuberculosis is a disease caused by the bacteria *Mycobacterium tuberculosis* (Mtb) which latently infects one-quarter of the human population and is the leading cause of death by an infectious agent. Contributing to the challenge of this old disease is the lack of (1) an effective vaccine, (2) reliable biomarkers for latent infection, (3) the limited number of effective antimicrobial drugs, (4) a prolonged therapeutic regime, and (5) the evolution of multi-drug resistant strains. This increasingly foment the need for novel therapies that target the bacterial niche or improve the host response, alone and in combination with the current conventional therapy. We have been probing the intracellular niche of Mtb, the macrophage, for how these bacteria survive and replicate inside them while impairing their bactericidal response. In that search, we found that Mtb induces a decrease in the expression of a group of proteolytic enzymes, the cathepsins, that participate in key cellular processes regulating homeostasis, cell death, inflammation, antigen presentation, and microbial killing. Regarding Mtb infection, this downregulation results in improved bacterial survival and replication inside macrophages as well as poor lymphocyte priming