

■日韓合同シンポジウム (JKJS)

日時：9月6日(土) 15:00～16:30

会場：A会場(会議場1階 メインホール)

座長：後藤 哲哉(鹿大 院医歯 機能形態)

「Novel diagnostic approaches to periodontal disease focusing on oral microflora and immune responses」

15:00～15:30

JKJS-1 「Single-Cell Transcriptomic Insights into the Immunopathogenesis of Aggressive Periodontitis」

Jin Man Kim¹(¹Dept Oral Microbiol and Immunol, Seoul Natl Univ Sch Dent)

Aggressive periodontitis (AP, Grade C periodontitis) represents the most severe phenotype, characterized by rapid alveolar bone destruction and tooth loss, significantly affecting patients' quality of life. Despite its severity, the precise mechanisms underlying the immunopathogenesis of the disease remain unclear. To gain mechanistic insight into pathophysiology of AP, single-cell RNA sequencing (scRNA-seq) was performed on gingival tissues from healthy individuals and patients with chronic or aggressive periodontitis. We successfully constructed an integrative single-cell atlas of human gingival tissue, comprising 79,829 cells from 15 individuals. Iterative clustering

identified a unique cluster of B cells in the AP group, characterized by dominant expression of ID3, a key suppressor of plasma cell development. This finding was demonstrated by the observation of impaired antibody class switching in AP patients. Retrospective cohort analysis revealed that IgM levels in GCF were strongly associated with the Grade (progression rate) and Stage (severity) classification. Notably, secreted IgM exhibited autoreactivity to gingival tissues, suggesting a potential autoimmune mechanism underlying AP. These findings uncover distinct immune profiles at high resolution, offering new insights into the immunopathogenic mechanisms of AP.

15:30～16:00

JKJS-2 「Development and application of a novel trypsin-like peptidase activity assay kit」

Michihiko Usui¹(¹Div Periodontol, Kyushu Dent Univ)

Periodontal disease is a chronic inflammatory disease caused by periodontal bacteria that induces the production of several inflammatory mediators. *Porphyromonas gingivalis*, *Tannerella forsythia*, and *Treponema denticola*, which are obligatory anaerobic oral bacteria known as 'Red Complex' have been reported to be associated with pathogenesis and progression of periodontal disease. These bacteria also produce trypsin-like peptidase (TLP). Recently, a novel TLP activity assay kit (TLP-AA kit), ADCHECK®,

was developed. This kit is also a rapid and reliable chair-side diagnostic test, which can be performed in approximately 13 min and can provide information about the presence of TLP in samples. The accuracy of the test kit for the presence of red complex pathogens determined by real-time PCR was 92%. We examined the effectiveness of a novel TLP-AA kit in detecting severe periodontitis in a study with an adequate sample size. Multivariable logistic regression analyses revealed that the results of the test

kit were significantly associated with severe periodontitis. Furthermore, tongue swab TLP activity by a novel TLP-AA kit was significantly associated with reduced kidney function

(decreased estimated glomerular filtration rate). A TLP-AA kit might be a useful tool in health screening.

16:00 ~ 16:30

JKJS-3 「Structure and dynamics of oral indigenous microbiota in healthy individuals」

Toru Takeshita¹

(¹Fac Dent Sci, Sect Prevent Dent Public Health, Kyushu Univ)

The oral cavity is densely populated with diverse commensal microorganisms, and several of these taxa have been identified as etiologic agents of two major oral diseases: dental caries and periodontitis. However, recent studies using DNA-based open-ended approaches have suggested that the other indigenous members could also be associated with the diseases. These diseases are now assumed to be triggered by a dysbiotic composition of the overall microbiota, rather than the presence of specific pathogens.

To identify a 'healthy' oral microbiota that could be targeted for oral health promotion, we have conducted molecular epidemiological studies, including a large population-based

study of oral indigenous microbiota in saliva of community-dwelling adults. The microbiota of individuals with healthy oral conditions was characterized by a higher predominance of several indigenous taxa such as *Neisseria flavescens* and *Haemophilus parainfluenzae*. Longitudinal observations suggest that the microbiota composition remains relatively stable during middle age, but often undergoes dysbiotic shift during old age. In this presentation, I will introduce the results of our epidemiological studies on the structure and dynamics of the oral indigenous microbiota associated with a healthy oral cavity.