



Dr. Yaping Pan

## 略歷

### Position and Title

- Elected President of Academy of Periodontology of Chinese Stomatological Association
- Vice President of Liaoning Stomatological Association
- Editorial Board of Chinese Journal of Stomatology
- Professor and Chair of Department of Periodontology and Oral Biology, College of Stomatology, China Medical University, Shenyang, China

### Education

- 1991-1994 West China School / Hospital of Stomatology Sichuan University, Chengdu, China, Doctor in Periodontitis
- 1986-1989 China Medical University, Shenyang, China, Master in Oral Medicine
- 1981-1986 China Medical University, Shenyang, China, Bachelor in Stomatology

### Professional Experience

- 2006-2008 State University of New York, SUNY, Department of Oral Biology, School of Dentistry, Buffalo, USA, Co-Investigator
- 2001-2002 University of Minnesota, Department of Oral Sciences, School of Dentistry, Minneapolis, USA, Visiting Associate Professor
- 1999-2001 The University of Alabama, UA, Department of Oral Biology, School of Dentistry, Birmingham, USA, Visiting Scholar

## Research progress of *Porphyromonas gingivalis* infection promoting the tumorigenic potential of oral epithelial cells

Department of Periodontology and Oral Biology,  
School and Hospital of Stomatology, China Medical University  
Ze Lua, Yuchao Lia, Shuwei Zhanga, Fengxue Genga, ○Yaping Pan

Chronic periodontitis is one of the most common chronic inflammatory diseases in the oral cavity, which is usually characterized by chronic progressive destruction of periodontal supporting tissue. However, in clinical work, we have observed that gingival tissue swelling and hyperplasia is also an important feature, Especially in severe periodontitis or need to take medicines in patients with systemic diseases such as organ transplant patients, hypertension patients, and pregnant women. In recent years, more and more studies suggest that periodontitis is associated with a variety of systemic diseases, such as respiratory system, digestive system, cardiovascular system, etc., and it is more noteworthy that there is a strong correlation between periodontitis and headneck squamous cell carcinoma (HNSCC). The American Cancer Society also noted in 2020 projections that 15%-20% of HNSCC cases do not have traditional risk factors, genetic predisposition and chronic inflammation caused by various bacterial or viruses play an important role in the etiology of oral cancer. In epidemiological studies, our team found that a large number of periodontal pathogens were present in cancer and adjacent tissues and predicted a poor prognosis, suggesting that periodontal pathogens are closely related to the occurrence and development of HNSCC, especially oral squamous cell carcinoma (OSCC). In the following study, our team found that *Porphyromonas gingivalis* (*P. gingivalis*), the key pathogen of periodontitis, caused a completely different phenomenon when infected with different multiplicity of infection (MOI). In particular, infection of oral epithelial cells with MOI 1 (low doses) can induce changes in cyclin, accelerate cell cycle and promote cell proliferation. The infected cells were characterized by enlarged nuclei and abnormal chromatin morphology and structure. Further research found that *P. gingivalis* can invade cells, multiply and spread in them, and then escape the killing effect of humoral immunity to form chronic inflammation and deep infection. At the molecular level, we found that continuous infection of *P. gingivalis* can activate a variety of tumor-related genes, and jointly enhance the tumorigenic potential of oral epithelial cells in terms of proliferation, cycle, apoptosis, invasion, migration and colony formation. At the level of immune research, it was found that *P. gingivalis* could not only evade and destroy immune cells, but also indirectly promote the occurrence of tumors by inducing various epigenetic modifications. In our studies on other periodontal pathogens, *Fusobacterium nucleatum* (*F. nucleatum*) infection also causes epithelial mesenchymal transformation (EMT) phenotype in oral epithelial cells, and *F. nucleatum* also causes DNA damage and promotes cell proliferation. In conclusion, periodontitis and its pathogenic bacteria are closely related to the occurrence of multiple systemic diseases, especially tumors, revealing the specific mechanism will help to better prevent and treat related diseases.