

## **Porphyromonas *gingivalis* virulence factors Inhibitors screening in oral squamous cell carcinoma (OSCC)**

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### **ABSTRACT**

Cancers are either directly or indirectly affected by the bacterial infection. Finding out the bacterial involvement and influence in cancer development may provide a new direction and therapeutics approach in cancer prevention. Several studies revealed that oral bacteria play an important role in the development of oral cancer. The best confirmed case, showing carcinogenic effect of periopathogen *Porphyromonas gingivalis*. It acts as a keystone pathogen in the development of chronic periodontitis. *P. gingivalis* involvement in cancers has evolved within the last decades. Among all observed cancers relation the strongest association of *P. gingivalis* has been found with oral squamous cell carcinoma (OSCC). *P. gingivalis* can give rise to oncogenic effect in three ways: leading to chronic inflammation, inducing antiapoptotic activity, and producing carcinogenic substances. *P. gingivalis* produced several virulence factors i.e., fimbriae (FimA), cysteine proteases (gingipains- arginine (Arg) and lysine (Lys), and nucleoside diphosphate kinase (NDK) etc. *P. gingivalis* enters and invading the epithelial cells through their FimA that can prevent the apoptosis in gingival epithelial cells through the manipulation of P13K/AKT and JAK/Stat pathway. *P. gingivalis* gingipains extracellularly excites the protease activator receptor (PAR) and activates a PAR2/NF- $\kappa$ B pathway which induces MMP9 production and leads to metastasis. Gingipains are also vital for the processing and maturation of the major fimbriae (FimA). Current work will focus on to find out interactions of gingipains with natural inhibitors using bioinformatics approach, which may provide useful prevention for oral cancer that is chronically infected with *P. gingivalis*.

**Keywords:** *Porphyromonas gingivalis*, Gingipains, Oral squamous cell carcinoma (OSCC).

