

B-5. Nitric oxide production and inducible nitric oxide synthase expression induced by surface-associated material from *Porphyromonas gingivalis*

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Objectives

Because production of nitric oxide (NO) has been recognized as a marker in a variety of human diseases associated with inflammation, we studied the effects of surface-associated material (SAM) from *Porphyromonas gingivalis*, one of the causative agents of inflammatory periodontal disease, on the production of NO and expression of iNOS in the murine macrophage cell line RAW264.7. We also attempted to throw light on the signaling mechanisms involved in *P. gingivalis* SAM-induced NO production.

Materials and methods

SAM from *P. gingivalis* 381 was obtained by saline extraction, as described by Wilson et al. NO production was assayed by measuring the accumulation of nitrite in culture supernatants. Western blot analysis of iNOS and analysis of reverse transcription (RT)-PCR products were carried out.

Results

We found that *P. gingivalis* SAM can induce iNOS expression and stimulate the release of NO without additional stimuli and demonstrated an important role of the transcription factor NF- κ B and microtubule polymerization in NO production. The production of NO required L-arginine and protein tyrosine kinase but not activation of protein kinase C.

Conclusions

The present study clearly shows that *P. gingivalis* SAM fully induced iNOS expression and NO production in RAW264.7 cells in the absence of other stimuli. The ability of *P. gingivalis* SAM to promote the production of NO may be important in the pathogenesis of inflammatory periodontal disease.