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Passive Immunization with Egg Yolk Antibody against *Porphyromonas gingivalis* Gingipains.

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## Background

The purpose of this study was to investigate the ability of anti-*Porphyromonas gingivalis* gingipains egg yolk antibody (IgY-GP) against gingipains activity. In addition, we applied IgY-GP subgingivally in periodontitis patients.

## Methods

IgY-GP was isolated yolks of immunized White Leghorn hens with purified gingipains. Control antibody (IgY) was similarly isolated yolks of nonimmunized hens. Gingipains activity was determined by the rate of enzymatic substrate hydrolysis and IL-8-77 digestion. Ca9-22 cells were cultured in the absence of gingipains with or without the pretreatment of either IgY-GP or IgY. Attached cell numbers were determined by trypan blue staining. In clinical trial, ten chronic periodontitis patients were selected. Prior to administration of IgY-GP at baseline, scaling and root planing (SRP) was performed at all surfaces of tested teeth. *P. gingivalis* levels of the pocket in all treated teeth were expressed as the percentage of the total bacteria using real-time PCR.

## Results

In the presence of IgY-GP, the hydrolysis activities of gingipains were reduced. IL-8 degradation was significantly reduced by IgY-GP, but not by IgY, demonstrating its specificity. Cells incubated with gingipains showed a dose-dependent loss of the adhesion activity. Prior treatment of gingipains with an IgY-GP, but not IgY, strongly inhibited the detachment of cells. In clinical trial, SRP combined with the use of IgY-GP reduced bleeding on probing and *P. gingivalis* levels at 30 days. No side-effects were observed in IgY-GP administration.

## Conclusion

These studies support the use of IgY-GP to interfere the gingipains activities. IgY-GP may provide an important adjunctive therapy to the treatment of periodontitis.