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学位論文内容の要旨

博士の専攻分野の名称　　博士（歯学）　　氏　名　張洪波

学　位　論　文　題　名

Antibacterial potential of colloidal platinum nanoparticles against *Streptococcus mutans*

（ストレプトコッカスミュータンスに対する白金ナノコロイドの抗菌性）

キーワード（５つ）　Nanoparticle, *Streptococcus mutans*, Antibacterial agent, Biofilm, Scanning electron microscopy

This study evaluated the antibacterial activity of colloidal platinum nanoparticles (CPNs) toward *Streptococcus mutans* (*S. mutans*) viability. *S. mutans 109c* was treated with water and three CPN solutions at 37°C for 24 h (i.e., control, PAA-Pt, C-Pt, C-CyD-Pt). Dilution series (10^{-1}–10^{-5}) were prepared using brain heart infusion (BHI) broth for all samples, and a 100 µL suspension of each dilution was spread onto a BHI agar plate. Colony-forming units (CFU/mL) were determined after 24 h. The effects of CPNs on *S. mutans* survival and biofilm formation were investigated using fluorescence and scanning electron microscopies. The antibacterial rate of *S. mutans* increased with increasing concentrations of all three CPNs, with PAA-Pt nanoparticles exhibiting the highest antibacterial efficacy. CPNs were found to reduce *S. mutans* growth and inhibit biofilm formation remarkably.