

Wang L; Zhang H; Deng Y; Luo Z; Liu X; Wei S, Study of oral microbial adhesion and biofilm formation on the surface of nano-fluorohydroxyapatite/polyetheretherketone composite. Zhonghua kou qiang yi xue za zhi = Zhonghua kouqiang yixue zazhi = Chinese journal of stomatology; VOL: 50 (6); p. 378-82 /201506/

**ABSTRACT:** To develop novel polyetheretherketone (PEEK) based nanocomposites which possess the favorable antibacterial property, and to investigate the oral microbial adhesion and biofilm formation on the surfaces of PEEK, nano-fluorohydroxyapatite (n-FHA)-PEEK and nano-hydroxyapatite (n-HA)-PEEK.

**METHODS:** The bacterial adhesion and biofilm formation on the surfaces of n-FHA-PEEK, n-HA-PEEK were investigated via microbial viability assay kit and laser scanning confocal microscope (LSCM), respectively, with pure PEEK as control group.

**RESULTS:** No significantly statistical difference were found in the bacterial adhesion amounts on the surfaces of n-FHA-PEEK, n-HA-PEEK and PEEK at 1 h and 4 h. However, the number of bacteria on the n-FHA-PEEK surface decreased dramatically at 2 h ( $0.496 \pm 0.008$ ) compared with n-HA-PEEK groups ( $0.543 \pm 0.015$ ,  $P < 0.01$ ). Although the biofilms formation on surfaces observed by LSCM had similar morphology and thickness at 3, 7, 14 d, that on the n-FHA-PEEK surface showed the highest dead-to-live bacteria ratio among the three materials at 14 d.

**CONCLUSIONS:** The combination of n-HA, especially for the n-FHA could inhibit the bacteria adhesion and accelerate the bacterial death, eventually may have an influence on the structure of biofilms and reduce the risk of peri-implantitis. Therefore, n-FHA-PEEK nanocomposites presented a good prospect for clinical applications as dental implant materials.

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