

## Surface modifications for implants in dental applications: screw-type solid fixture and 3D-printed interconnected porous scaffold

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### Abstract

Some biocompatible materials, such as pure titanium (Ti), Ti alloy, and zirconia ( $ZrO_2$ ), have been widely used in the screw-type dental implant system, including abutment and fixture. Various surface modifications are applied to the commercial screw-type dental implant systems for improving the osseointegration of implant surfaces. On the other hand, with the rapid progress of digital dentistry, the interconnected porous metallic scaffolds can be manufactured using 3D printing process in implant applications, such as lower jaw implant. In this case, suitable surface modification is still necessary based on clinical respects; however, relatively limited surface modifications can be potentially considered. In my talk, some of the research work on the abovementioned issues, being carried out in my laboratory, will be presented. Particularly, the effects of surface biomolecule immobilization on the biological responses to the surfaces of the screw-type solid Ti and  $ZrO_2$  dental implant fixtures and the 3D-printed interconnected porous Ti alloy scaffold.

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