

Implant surfaces

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The implant surface is known to be of importance for the biological response to the implant. All events that occur towards a surface depend on its mechanical, physical, chemical and topographical properties. Implant surface topography has gained a huge interest during the last 15 years, especially from those with commercial interests. Claims have been made about surfaces with unique properties for fast and firm osseointegration by various manufacturers over the years. In the 1970s and 1980s turned minimally rough surfaces were the gold standard, a surface which still is the best documented. Titanium or hydroxy apatite plasma sprayed, rough surfaces became common during the latter part of the 1980s. However, studies performed at our laboratories demonstrated that the strongest bone response was seen to moderately rough surfaces that, from a topographical point of view displayed properties between turned and plasma sprayed implants; i.e. with Sa of 1-2 micrometers. These are characteristics of the great majority of contemporary oral implant systems. Our current research focuses on the potentials of roughness at the nanometer level of resolution and on bioactive implant surfaces. Despite some positive indications from *in vitro* studies, our knowledge of the importance of nanometer sized irregularities for bone- and soft tissue integration remains insufficiently investigated in *in vivo*. Furthermore, implants claimed to be bioactivity may as well have an altered nanometer roughness, the clinical implications of this finding is, however, still unknown.