Weiwei Lao et al., J Oral Hyg Health 2018, Volume 6
DOI: 10.4172/2332-0702-C1-008

Establishment of a topography analytical method for activity prediction of nano-submicro-micro hybrid titanium surfaces

Weiwei Lao, Qiaojie Luo and Xiaodong Li
Zhejiang University, China

Dential implants of micro topographical surfaces have been widely used in clinic and has obtained high success rate, through the mechanism of increasing the local factor levels to produce an osteogenic environment. Nowadays, nontopographical features are hoped to improve osteointegration and surfaces of Nano-Submicro-micro hybrid topography are prized in biomaterial research. However, to obtain the Nano-Submicro-micro hybrid topographical implant of desirable property is hit-and-miss, without guidance or quantitative topographical parameters to predict biological performance. In the present study, we constructed a series of titanium surfaces of Nano-Submicro-micro topographical feature, through the combination of sandblasting, acid etching and alkali treatment. With the increase time in alkali treatment, the Nano-scale structure strengthened with the micro and Submicro scale structures weakened. *In vitro* and *in vivo* studies showed that the osteogenesis of these surfaces, increased first and then decreased. We constructed a set of SEM-image dependent topography analytical methods to quantitatively analyze the topography features of each scales. Based on the series titanium surfaces with high consistence in surface chemistry, matter phase structures and the topography analytical methods, we found that the complexity of structure in each scale played important role in biological activity and it was the sum of complexity in all scales that determined the overall performance of the implant. In further study, we will analyze more surfaces to refine the analysis method and would be a promising model to predict the surfaces of the highest bioactivity in a specific topographical series of implant surfaces.

Biography

Weiwei Lao is working at the department of Conservative Dentistry and Periodontics in Affiliated Hospital of Stomatology, College of Medicine, Zhejiang University China.

wwlao@zju.edu.cn

Notes: