

## TiUnite® and Osseointegration

Preclinical and clinical studies show that the bone formation pattern on—and in the vicinity of—TiUnite® differs from that around implants with a machined surface<sup>1-3</sup>. Bone contacts at machined implant surfaces, as observed histologically, are mainly the result of bone growth in a perpendicular direction toward the implant<sup>1</sup>. On TiUnite®, however, newly formed bone, emanating from existing bone structures, also grows by osseointegration along and in direct contact with the implant surface. This bone formation pattern has been observed repeatedly in histological investigations of TiUnite® implants<sup>1-6</sup>, and has been visualized in detail in a microscopic study<sup>7</sup>. From an osseointegration point of view, the bone-healing pattern on TiUnite® resembles that on hydroxyapatite<sup>1</sup>, which is a well-known osseointegrative material.

Histomorphometrical analyses demonstrate that the enhanced bone response to TiUnite® results in faster coverage of the implant surface compared with machined implants, which translates into a higher bone-to-implant contact already during the early stages of healing<sup>1-3,8</sup>. The intimate anchorage between TiUnite® and the surrounding bone results in better maintenance of implant stability during the early healing phase compared to machined implants<sup>9-10</sup>.

The osseointegrative properties of TiUnite® implants are further enhanced by the addition of a macroscopic groove along the thread of the implant, such as on Nobel Biocare's Groovy implants. Histological studies demonstrate preferential and faster bone growth by osseointegration within and along the groove compared to the surrounding surfaces, resulting in a further increase of the rate of osseointegration of the TiUnite® Groovy implants<sup>3,11</sup>.

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