

IMPLANTOLOGY CONFIDENCE

Straumann® SLActive®
Performance beyond
imagination.



 **straumann**



MORE THAN 10 YEARS OF CLINICAL SUCCESS AND PROVEN PREDICTABILITY¹

**IMMEDIATE
LOADING**

High predictability
in immediate
loading.

**COMPROMISED
PATIENTS**

Outstanding success
in compromised
patient groups.

**ENHANCED BONE
GRAFTING**

Significantly higher
formation of new
bone aggregate.

Beyond hydrophilicity

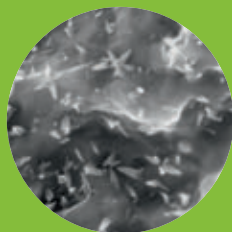
More than 15 years ago, Straumann® pioneered accelerated osseointegration with the innovative hydrophilic SLActive® surface, reducing initial healing time to 3–4 weeks.*^{2–10} Since then SLActive® implants have made faster treatment and better outcomes a reality. The extensive healing potential of SLActive® can now be seen even in severely compromised patients and with challenging treatment protocols.^{11–13}

Leading researchers worldwide are looking at what's behind the outstanding clinical performance of SLActive®. As new insights emerge, recently discovered nano-structures explain why the SLActive® surface goes beyond hydrophilicity.

Discover the science of high performance.

NEW INSIGHTS INTO SLACTIVE® SURFACE PERFORMANCE

NANO-STRUCTURES ON SLACTIVE® SURFACE



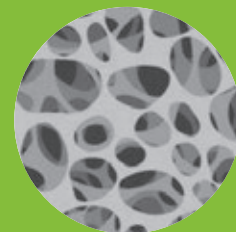
Distinct nano-structures are present on the SLActive®, but not on the SLA® surface.^{14, 15}

INCREASED SURFACE AREA



Nano-structures increase the SLActive® surface area by more than 50%.¹⁶

NANO-STRUCTURES SUPPORT EARLY OSSEOINTEGRATION



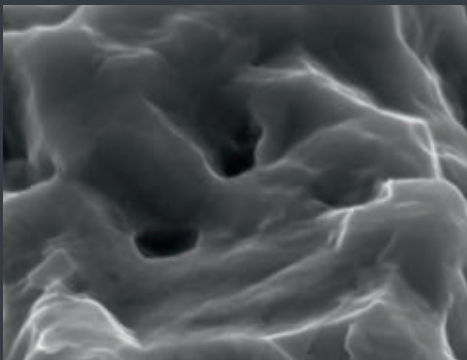
In-vitro research shows that nano-structures enhance fibrin network formation and bone cell mineralisation.^{17, 18}

*Healing time defined by BIC and stability

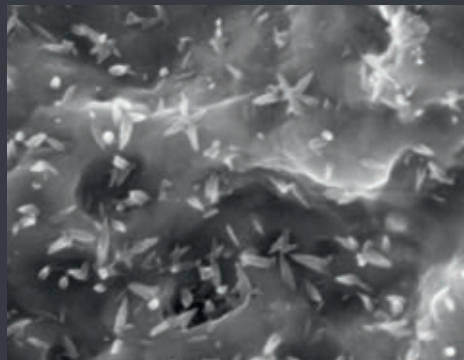
Discover the science of high performance



NANO-STRUCTURES PRESENT ON THE SLACTIVE® SURFACE



Roxolid® SLA®



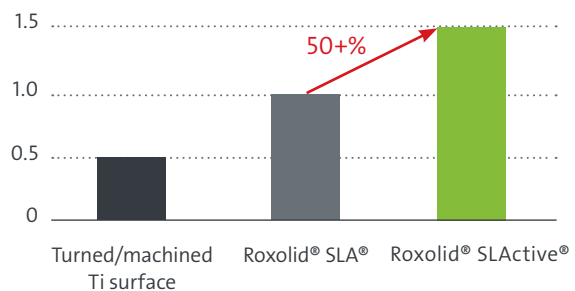
Roxolid® SLActive®

Distinct nano-structures recently discovered on the SLActive® surface, prove for the first time, that the SLActive® surface topography differs from that of SLA®.

NANO-STRUCTURES ON SLACTIVE® INCREASE SURFACE AREA BY MORE THAN 50 %¹⁶

- Larger surface area in contact with bone enhances BIC*¹⁹
- SLA/SLActive® micro-roughness increases the surface area by at least 100 % compared to the machined surface¹⁰
- Nano-structures increase the SLActive® surface area by more than 50 %.¹⁶

Implant surface area increase



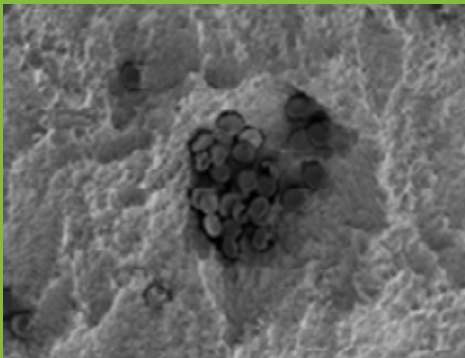
Y-axis: 1=100%

* BIC = Bone to implant contact

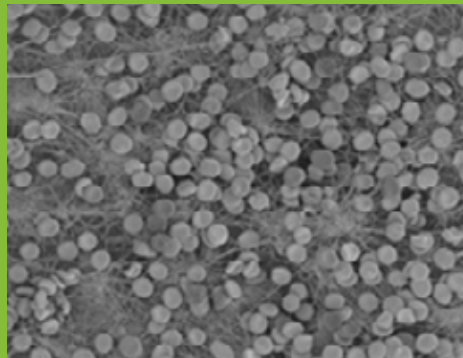
The advanced in-vitro research suggests that hydrophilicity alone does not fully explain the accelerated osseointegration associated with the SLActive® surface properties. The data indicates that nanostructures on the SLActive® surface support fibrin network formation and mineralization, thus facilitating the early phases of osseointegration.

Indeed, SLActive® with nano-structures shows a higher level of fibrin network formation and bone cell mineralization compared to SLActive® without nano-structures (in vitro).^{17, 18, 20}

ENHANCED FIBRIN NETWORK FORMATION ON SLACTIVE® WITH NANO-STRUCTURES^{17, 18, 20}



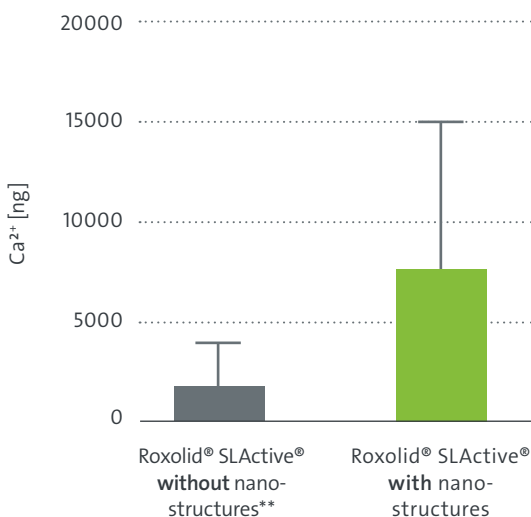
Roxolid® SLActive® surface without nano-structures**



Roxolid® SLActive® surface with nano-structures

SEM imaging of fibrin network formation on Roxolid® SLActive®. (15 min incubation with human whole blood.)*

HIGHER BONE CELL MINERALISATION ON SLACTIVE® WITH NANO-STRUCTURES^{17, 18}



P < 0.01

Mineralisation of human bone cells measured after 28 days laid on top of blood incubated surfaces. Summarized Ca²⁺ concentrations at the end of culture as a function of surface.*

* Empa, Swiss Federal Laboratories for Materials Science and Technology. www.empa.ch

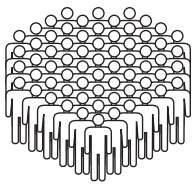
** Experimental surface to study the effect of nanostructures

IMMEDIATE LOADING WITH LONG-LASTING RESULTS

Ever increasing patient expectations continue to drive demand for faster, safer and more efficient treatment protocols. Immediate loading allows a patient to benefit from the restoration straightaway. However, this demanding protocol carries a higher risk of failure due to pre-mature loading of a healing implant.

The long-term clinical data from a randomized, controlled, multicenter study demonstrate the impressive performance of SLActive® with immediate loading. The SLActive® implants showed a 10-year survival rate of 98.2% in this challenging protocol.¹

Study design



64 Patients

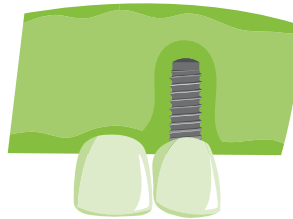


10 years

Study follow-up

Indication

Maxilla or mandible of partially edentulous patients; temporary restoration (single crown or 2–4 unit fixed partial denture) was replaced by permanent restoration 20 to 23 weeks post surgery



Immediate loading

39 implants
(restored the same day)



Early loading

50 implants
(restored after 28–34 days)

Randomized, controlled, multicenter study



Conclusion

SLActive® implants provide a long-term highly predictable treatment option. Crestal bone changes in immediate and early loading are comparable to those observed with conventional loading.

Implant survival rate in immediate loading,
after 10 years¹²



Randomized controlled multicenter study (30 patients, 39 implants)

SLActive® in irradiated patients

Predictability beyond expectations

One of the most challenging patient groups for implant treatment includes patients who have undergone a combination of tumor surgery, chemotherapy and radiotherapy. Irradiation leads to decreased bone vascularity,^{21, 22} impaired osteoblastic activity²³ and reduced bone vitality,^{24, 25} which severely compromise bone quality in these patients. The fragile mucosa and the risk of osteoradionecrosis present further challenges. However, from a quality-of-life perspective, this patient group stands to benefit the most from implant-supported prosthetic rehabilitation.

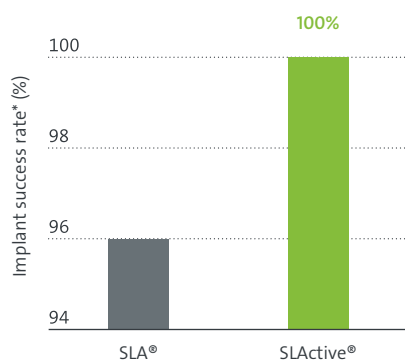
SLActive® showed a 100% success rate in irradiated patients in a recent randomized clinical trial (RCT).¹¹ Based on published reviews,²⁶⁻²⁹ it can be determined that the surgical intervention in patients who received head and neck irradiation is preferably avoided as it has been associated with decreased healing and increased potential for development of osteoradionecrosis. However, no other implant surface has demonstrated such high success rate in this patient group within an RCT setting. Remarkably, at the 5-year follow-up none of the surviving patients had an SLActive® implant failure. The effective implant survival rate was an outstanding 100%.^{11, 30}

SLACTIVE® PERFORMANCE IN IRRADIATED PATIENTS

Randomized Clinical Trial¹³:

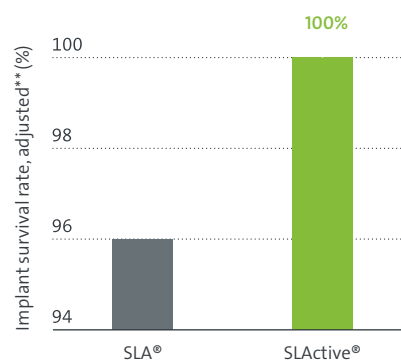
- 102 implants, 20 patients
- Post-surgery, radiotherapy and chemotherapy for oral carcinoma

1-year follow-up¹³



One patient was excluded from the study due to tumor recurrence. Therefore, the graph is based on 19 patients with 97 implants.

5-year follow-up^{11,30}



Excludes four additional patients who died due to cancer. Therefore, the graph is based on 15 patients with 79 implants.

* Success criteria as per Buser D. et al. Long-term stability of osseointegrated implants in augmented bone: A 5-year prospective study in partially edentulous patients. Int J Periodont Restor Dent. 2002; 22: 108-17.

** Adjusted, excluding the patients deceased due to cancer.



Uncompromised performance Even in diabetic patients

Patients with diabetes have reduced wound-healing capacity,^{31, 32} putting dental implants at risk, particularly if the patient is unaware of the condition. Worldwide, more than half a billion people are living with diabetes. 1 in 10 adults has diabetes, while among adults 60 years of age and older, the prevalence is twice as high.³³

Over the past 30 years, the number of people with diabetes in the US has quadrupled and, according to the U.S. Centers for Disease Control and Prevention, the figure could increase to as many as one in every three adults by 2050. In an estimated 50% of people with type 2 diabetes, the disease remains undiagnosed.³⁴

The placement of implants in smokers is often associated with high failure rates, risk of post-operative infections, and marginal bone loss.³⁵

HIGH PREDICTABILITY IN SMOKERS:

- Recent clinical studies comparing SLActive® performance in smokers and non smokers have reported excellent outcomes^{36, 37}
- SLActive® implants have showed 100 % survival and success rate clinically and radiographically, in smokers after 5 years³⁶

PERFORMANCE IN
SMOKER PATIENT GROUP³⁶



Given a rising prevalence of type 2 diabetes – how can clinicians address the risk, particularly in older patients?

GROWING CLINICAL EVIDENCE OF HIGHLY PREDICTABLE PERFORMANCE OF SLACTIVE® IN DIABETIC PATIENTS:

- A clinical study³⁸ that compared SLActive® performance in patients with and without diabetes showed uncompromised performance of SLActive® implants
- 100 % implant success rate in the diabetic group after 2 years
- Bone changes similar to those in non-diabetic individuals

PERFORMANCE IN
DIABETIC PATIENT GROUP³⁸



A prospective, case-control clinical study (15 diabetic and 14 non-diabetic individuals)

ADVANCED IN-VITRO RESEARCH SHOWS THAT ROXOLID SLACTIVE® SURFACE STIMULATES AN EARLY ANTI-INFLAMMATORY CELL RESPONSE³⁹

- SLActive® surface stimulates an early anti-inflammatory cell response compared to non SLActive® surfaces as measured in vitro as a reduction in pro inflammatory markers* and an increase in anti-inflammatory markers**.40
- SLActive® is associated with an increased anti-inflammatory macrophage response in the early healing phase in both healthy and diabetic animals. This may be an important mechanism to improve osseous healing under compromised systemic conditions.⁴¹

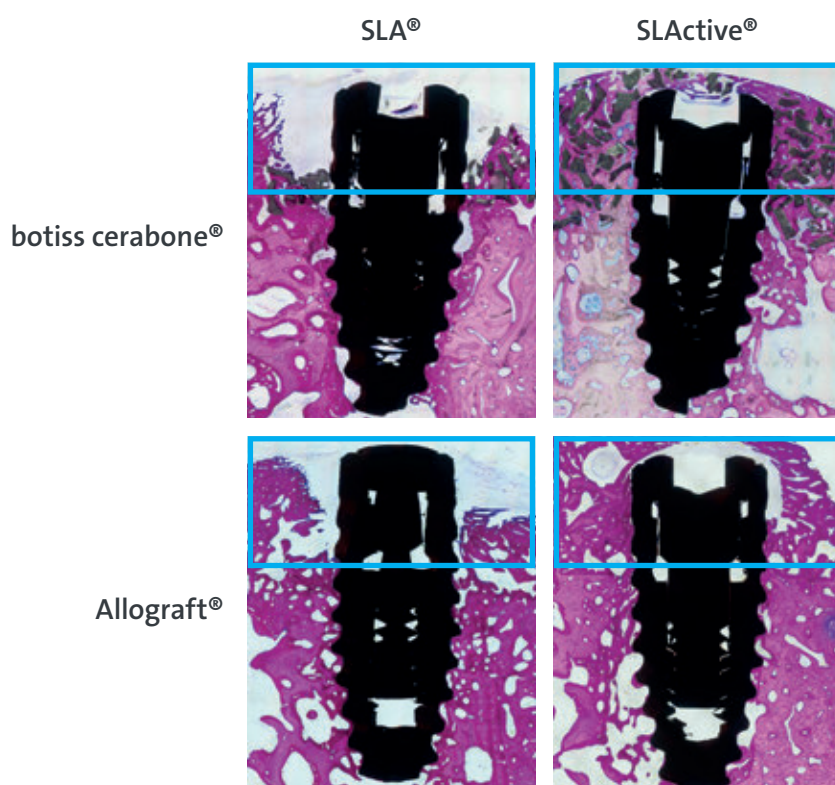
* IL1b, IL6, Tnfa, IL-1beta, IL-6, TNF-alpha (pro-inflammatory)

** IL4, IL10, TGFBI (anti-inflammatory markers)

Enhanced bone regeneration Even at compromised sites

Bone defects can greatly compromise the predictability of osseointegration. In a recent preclinical study⁴², SLActive[®] was associated with significantly higher formation of new bone aggregate compared to the standard Straumann[®] SLA[®] hydrophobic surface.

BONE AGGREGATE FORMATION AT 8 WEEKS⁴²



Histological views of bone aggregate (new bone and grafting material) 8 weeks post-grafting.

Outstanding clinical performance
even in compromised patients



Please contact your local sales representative to get more information about the advantages of the SLActive® surface now or visit www.straumann.com

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