

Biocompatibility . Cleanliness . Osseointegration

BCP[®] SURFACE TREATMENT



Pure like nature*

THE CORNERSTONE OF A SUCCESSFUL D

Promoting fast and effective osseointegration through optimized surface energy!

GOOD OSSEOINTEGRATION IS KEY TO A SUCCESSFUL RESTORATION!

Osseointegration is defined as a direct structural and functional connection between ordered living bone and the surface of a load-carrying implant (at a light microscopic level) (PI Brånemark et A Schroeder)^{4,9}.

In other words, **it is the firm anchorage of a dental implant that is provided by the growth of bone all around it.**

Several factors contribute to an effective osseointegration and a successful outcome:

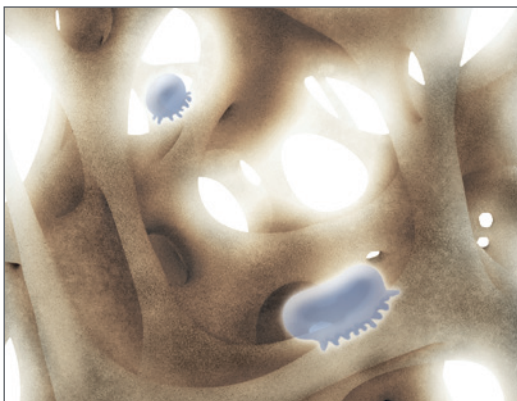
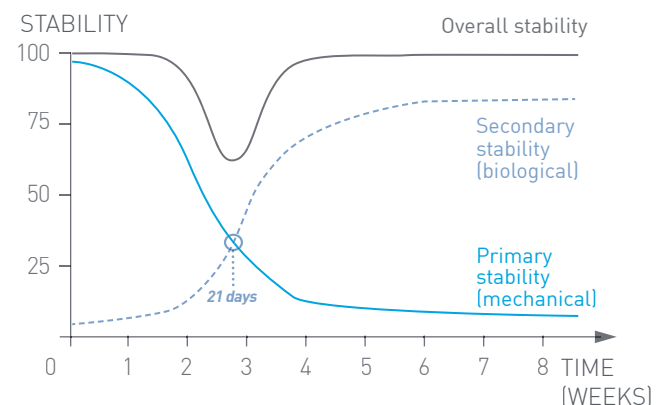


Image showing attachment of an osteoblastic cell to the interface matrix.

BONE REMODELLING PROCESS



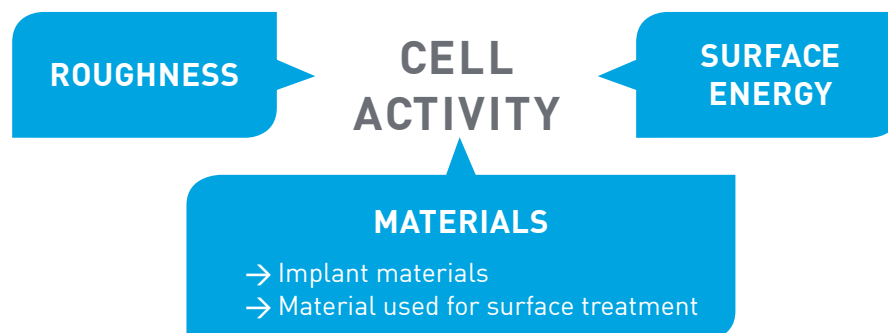
Source: S. Raghvendra, M.C. Wood, T.D. Taylor; Early wound healing around endosseous implants: a review of literature.

DENTAL IMPLANT TREATMENT!

IMPLANT SURFACE: A CRITICAL ISSUE!

The successful outcome of a dental implant depends on the interaction between hard and soft tissues. It is important to have soft tissue developing all around the implant to protect the bone-implant interface against microbiological attacks. It has been demonstrated in several studies that rough surfaces provide a stronger anchorage in the jawbone than smooth surfaces.

Several parameters need to be optimized to encourage cell activity and promote implant anchorage:



Primary stability:

→ The cells that die during drilling are eliminated by the osteoclasts during the bone resorption process.

Secondary stability:

→ The osteoblasts (which are responsible for bone formation) invade the interfacial space between the implant and the host bone and create a bone matrix.

The first 21 postoperative days are decisive in the process of implant anchorage and optimal bone remodeling.

A good oral hygiene is indispensable to reduce the risk of infection from endogenous or exogenous sources, and to achieve good tissue healing.

The aim is to minimize the risk of contamination and thus optimize the chances of success.

BCP® - BIPHASIC CALCIUM PHOSPHATE

BCP® is the one solution to achieve a perfect osseointegration!

BCP® bioceramics consists of a mixture of hydroxyapatite (HA) and β -TCP (beta-tricalcium phosphate). It comes in the form of abra

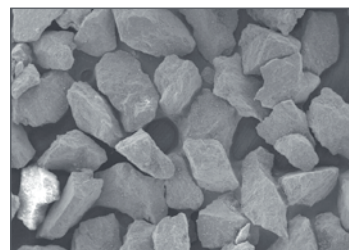
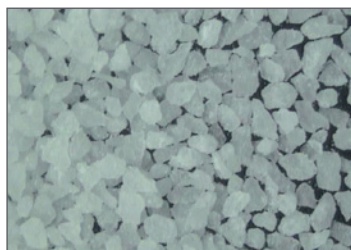
Micro sandblasting the implant surface with BCP® particles creates a rough, biocompatible surface.

Then, the implant is subjected to a mild acid treatment, and thoroughly rinsed and dried.

A PURE, BIOCOMPATIBLE SURFACE

- BCP® is 100% biocompatible.⁸
- BCP® composition is similar to the mineral component of human bone.
- Owing to its excellent solubility, it allows passivation of the implant without using a strong acid.³

The guarantee of a successful osseointegration with no contamination of the adjacent tissue.^{5,8}



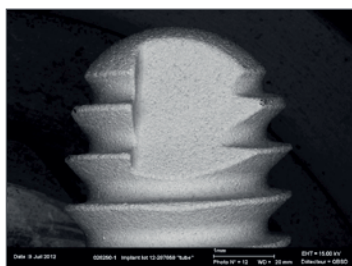
Zoomx 100 μ m

Photomicrographs of BCP® crystals taken at different magnifications

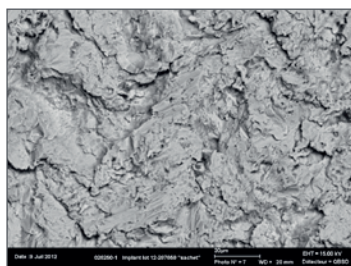
AN OPTIMAL SURFACE ROUGHNESS

- Macro-roughness is obtained by propelling BCP® particles onto the implant surface.
- A fine and close texture is obtained by passivation.
- R_a ranges from 1.5 to 2.0 μ m.

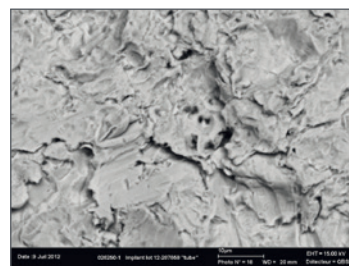
Excellent primary anchorage guarantees primary stability which is essential for a rapid osseointegration.^{2,4}



x 20



x 750



x 1000

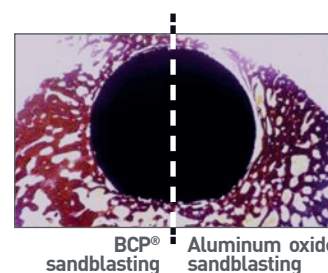
Photomicrographs of Anthogyr BCP® implant surfaces

asive particles.

PROMOTES OSTEOCONDUCTION

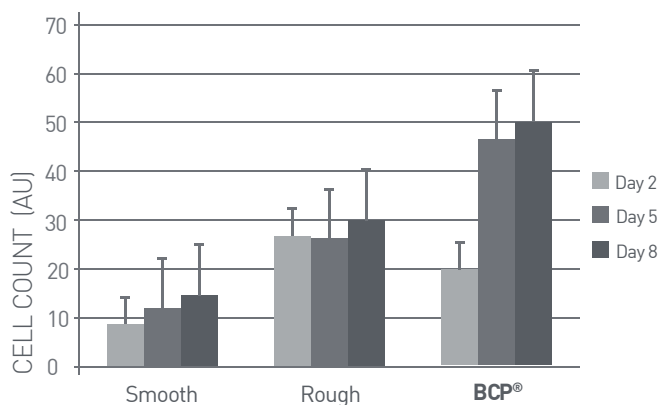
- Wettability of **BCP®**-treated implant surfaces is much higher than that of surfaces blasted with silica sand or aluminum oxide.⁷
- Bone-implant contact (BIC) exceeds 70%.

Enhanced cell attachment and higher cell proliferation.¹⁰

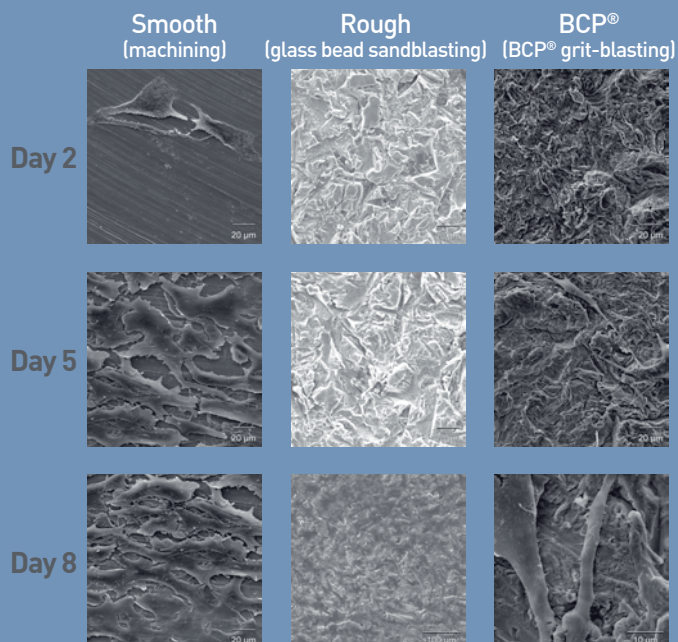


Cross-section of a rabbit femur. The BCP®-treated surface shows significant bone ongrowth.

Cell proliferation on each of the tested implant surfaces at day 2, day 5 and day 8



Source: Study performed by LMI Laboratory, Lyon (FRANCE)¹⁰

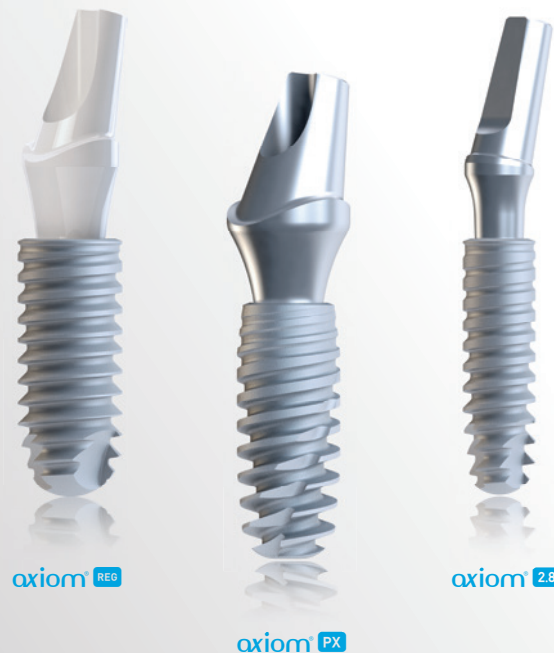


THE ANTHOGRYR SOLUTION

A fully controlled process for a comprehensive, user-friendly range of products which provides options for every clinical situation!

Why do all Anthogyr implants have a BCP® surface?

Because it is our commitment to offering best-in-class solutions that ensure fast and effective osseointegration.



Clinically proven performance!

Owing to its osteoconductive properties, BCP® is able to rapidly induce osteoblastic differentiation, thus optimizing bone-implant contact and mechanical fixation.

Anthogyr implants: successful osseointegration is achieved in more than 99% of the cases*



ABOUT ANTHOGRYR

With more than 70 years experience, Anthogyr is one of the world leaders in the manufacture and development of high quality medical devices.

Anthogyr offers a unique solution to dental care professionals, with full control of the manufacturing process from design to end product.

For more information, please visit: www.anthogyr.com

REFERENCES

- 1. D.BUSER, R.K.SCHENK, S.STEINEMANN, J.P. FIORELLINI, C.H. FOX, H.STICH
**Influence of surface characteristics on bone integration of titanium implants.
 A histomorphometric study in miniature pigs.**
 Journal of Biomedical Materials Research, 1991, Vol.25, p.889-902
- 2. A. CITEAU, J. GUICHEUX, C. VINATIER, P. LAYROLLE, T.P. NGUYEN, P. PILET, G. DACULSI
In vitro biological effects of titanium rough surface obtained by calcium phosphate grid blasting.
 Biomaterials, 2005, Vol.26, p.157-165
- 3. G. DACULSI
Biphasic calcium phosphate concept applied to artificial bone, implant coating and injectable bone substitute
 Biomaterials, 1998, Vol.19 , p.1473-1478
- 4. I. ERICSSON, CB. JOHANSSON, H. BYSTEDT, MR. NORTON
A histomorphometric evaluation of bone-to-implant contact on machine-prepared and roughened titanium dental implants.
 Clinical Oral Implant Research, 1994, Vol. 5, p.202-206
- 5. E.GOYENVALLE, E.AGUADO, R.COINET, X.BOUGES, G.DACULSI
Calcium phosphate ceramic blasting on Titanium surface improve bone ingrowth.
 Key engineering materials, 2008, Vols. 361-363, p.1351-1354
- 6. C. JOHANSSON, T. ALBREKTSSON
Integration of screw implants in the rabbit. A 1-year follow-up of removal torque of 12 titanium implants.
 The international Journal of Oral & Maxillofacial Implants, 1987, Vol.2, p.69-75
- 7. L. LE GUEHENNEC, A.SOUeidAN, P.LAYROLLE, Y. AMOURIQ
Surface treatments of titanium dental implants for rapid osseointegration.
 Dental Materials, 2007, Vol. 23, p.844-854
- 8. L. LE GUEHENNEC, M.A. LOPEZ-HEREDIA, B. ENKEL, P. WEISS, Y. AMOURIQ, P. LAYROLLE
Osteoblastic cell behaviour on different titanium implant surfaces.
 Acta Biomateriala, 2008, Vol.4, p.535-543
- 9. D.A. PULEO, M.V. THOMAS
Implant Surfaces.
 The dental clinics of North America, 2006, Vol.50, p.323-338
- 10. B.GROSGOGEAT & P.RENOUD
Etude de la cytocompatibilité de trois états de surfaces implantaire : évaluation et comparaison
 Communication orale : Europerio, Avril 2012



Detailed information about BCP® is provided in «Bibliography on BCP® Surface Treatment» which is available upon request as a hard copy or downloadable at www.anthogyr.com

BCP® surface treatment ensures:

- Purity, superior cleanliness and biocompatibility^{5,8},
- Enhanced implant anchorage,
- Increased cell development⁸,
- Consistent surface finish thanks to a fully controlled treatment process,
- Achievement of successful osseointegration in more than 99% of the cases.*

* Data on file at Anthogyr

