

*SURFACE CONCEPT
EVOLUTION*
NEODENT® ACQUA



ACQUA HYDROPHILIC SURFACE DESIGNED FOR HIGH TREATMENT PREDICTABILITY.

The Neodent® ACQUA hydrophilic surface is the next level of the highly successful S.L.A. type of surface designed for challenging situations, such as soft bone or immediate* protocols.^[1-4]

Hydrophilicity

The hydrophilic surface presents a smaller contact angle when in contact with hydrophilic liquids. This provides greater accessibility of organic fluids to ACQUA implant surface.**^[2]

SURFACE COMPARISON

Lab generated images



*NeoPoros Surface
(Based on the
abrasive sandblasting
concept followed by
acid etching).*



ACQUA Hydrophilic
Surface.
(S.L.A. type of surface)

Neodent implant designs featuring the ACQUA surface.



HELIX™



DRIVE™



TITAMAX®



HELIX SHORT



*HELIX
GM NARROW*

*For immediate load application, the primary stability must be at least 35 N.cm and the patient must present with physiological occlusion.

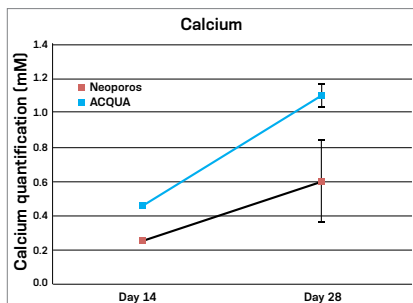
**Based on results of a pre-clinical study in animals; the pre-clinical testing is not correlated to long-term clinical outcomes in humans.

Note: Not all products depicted are available in all markets.

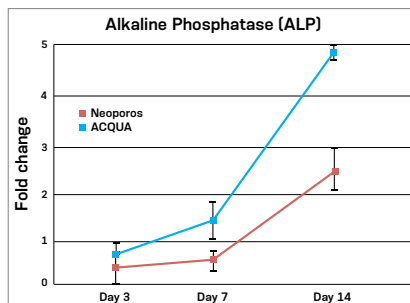
NEODENT® ACQUA SCIENTIFIC DATA



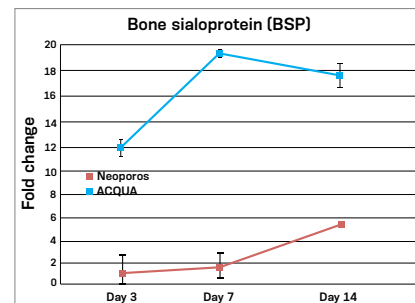
Effect of hydrophilic implant surfaces on differentiation of human mesenchymal stem cells⁽⁵⁾ - **ACQUA induces cell differentiation.**



hMSC mineralization on Neoporos and ACQUA surfaces assessed by quantification of calcium content. Data are expressed as mean $\pm$ standard deviation. n=3; *P < 0.05.



Adherent hMSCs ALP mRNA expression. Cells were plated on Neoporos and Acqua surfaces. Total RNA was isolated from cells at days three and seven of culture. Expression levels of ALP are compared for the surfaces / treatments. The results are shown as fold change $2^{-\Delta\Delta C_t}$ method, the mRNA expression relative to GAPDH was determined and the fold changes were calculated using the values of Neoporos day 3 control (*P < .05 compared to Neoporos day 3, n=3).



Adherent hMSCs BSP mRNA expression. Cells were plated on Neoporos and Acqua surfaces. Total RNA was isolated from cells at days 3 and 7 of culture. Expression levels of BSP are compared for the surfaces / treatments. The results are shown as fold change $2^{-\Delta\Delta C_t}$ method, the mRNA expression relative to GAPDH was determined and the fold changes were calculated using the values of Neoporos day 3 control. *P < .05 compared to Neoporos day 3, n=3.

Material & Methods:

- Commercially pure grade IV titanium disks
- Cell culture: Human Mesenchymal Stem Cells (hMSCs)
 - Cell viability and proliferation
 - Alkaline phosphatase activity
 - Calcium Assay
 - RT-PCR

Results and Conclusion: Both surfaces were able to modulate hMSCs responses toward osteoblast differentiation. Increased expression of genes related to the process of osteogenic differentiation as well as increased alkaline phosphatase activity and calcium content was observed for ACQUA surface.



Helix GM with ACQUA surface
a 2-year Retrospective Study

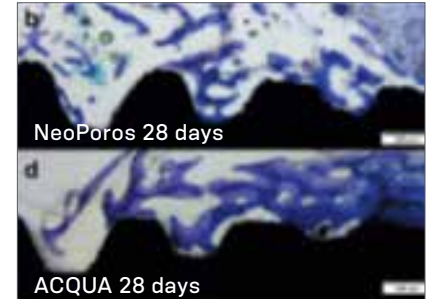
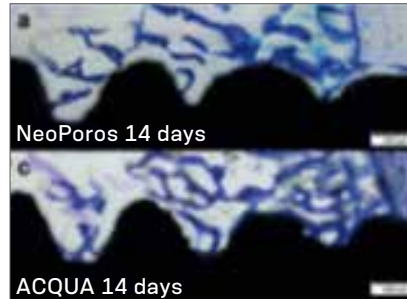




The surface chemistry and wettability of implants accelerate osseointegration and increase the area of the bone-to-implant interface in rabbit tibia^{[2]**} - **ACQUA accelerated bone to implant contact**



Contact angle of NeoPoros and ACQUA. It's possible to see that a drop of simulated body fluid (SBF) solution had been deposited onto sample surfaces. Note that the angle formed between solution drop and ACQUA surface was smaller than 5°.



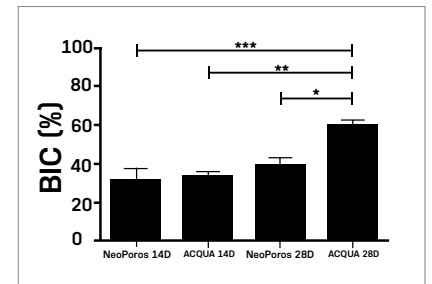
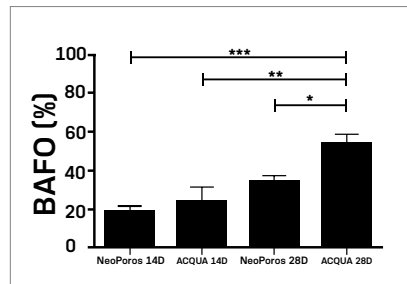
Photomicrographs of toluidine blue stained thin sections in bright field (original magnification 10X). Observe the presence of new bone formation in the area between threads and the contact between bone and both implant groups. In ACQUA at 28 days, see the presence of trabecular bone more compact and in a greater number than NeoPoros at the same period, suggesting the acceleration of osseointegration.

Material & Methods:

- Contact angle analysis (CAA) was employed for wetting evaluation
- 20 dental implants
- Histomorphometric evaluation: 14 and 28 days post-implantation

Results and Conclusion: The surface chemistry and wettability of ACQUA implants accelerated the implants' osseointegration and increased their bone-to-implant interface relative to the findings obtained for NeoPoros implants.

**Based on results of a pre-clinical study in animals; the pre-clinical testing is not correlated to long-term clinical outcomes in humans.



Histomorphometric analysis of (a) Bone area fraction occupied (BAFO) and (b) Mean bone-to-implant contact (BIC). BAFO was calculated as a percentage of the total region among the threads. BIC was calculated as a percentage of the total implant perimeter. Results are shown as mean percentages $\pm$ standard deviation. Statistically significant differences are indicated by an asterisk, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

References

- (1) Novellino MM, Sesma N, Zanardi PR, Laganá DC. Resonance frequency analysis of dental implants placed at the posterior maxilla varying the surface treatment only: A randomized clinical trial. Clin Implant Dent Relat Res. 2017 Jun 20. doi: 10.1111/cid.12510. [Epub ahead of print]
- (2) Sartoretto SC, Alves AT, Resende RF, et al. Early osseointegration driven by the surface chemistry and wettability of dental implants. J Appl Oral Sci. 2015 May-Jun;23(3):279-87.
- (3) Sartoretto SC, Alves AT, Zarranz L, et al. Hydrophilic surface of Ti6Al4V-ELI alloy improves the early bone apposition of sheep tibia. Clin Oral Implants Res. 2016 Jun 17. doi: 10.1111/clr.12894. [Epub ahead of print]
- (4) Val JE, Gómez-Moreno G, Ruiz-Linares M, et al. Effects of Surface Treatment Modification and Implant Design in Implants Placed Crestal and Subcrestally Applying Delayed Loading Protocol. J Craniofac Surg. 2017 Mar;28(2):552-558.
- (5) Mendonça G, Mendonça DBS, Oliveira LS, Araújo CA. Effect of hydrophilic implant surfaces on differentiation of human mesenchymal stem cells. ImplantNews 2013;10(6a-PBA)
- (6) Thomé G, Cartelli CA, Vianna CP, Trojan LC. Retrospective Clinical Study of 453 Novel Tapered Implants Placed in All Bone Types: Survival Rate Analysis Up to 2 Years of Follow-Up. Int J Oral Maxillofac Implants. 2020;35(4):757-761. (<https://pubmed.ncbi.nlm.nih.gov/32724928/>)

© Neodent® 2025. All rights reserved.

Neodent® and/or other trademarks and logos from Neodent® that are mentioned herein are the trademarks or registered trademarks of Straumann Holding AG and/or its affiliates. All rights reserved.

ifu.neodent.com.br/en
www.neodent.us • www.neodent.ca



Straumann North American Headquarters
Straumann USA, LLC
60 Minuteman Road
Andover, MA 01810
Phone 800/448 8168 (US) • 800/363 4024 (CA)
Fax 978/747 2490
www.straumann.us • www.straumann.ca

NAMLIT.2048 10/25 V2 PMR

