

# FISIOGRAFT nanoH.A.reinforced

*The first material which thanks to nanotechnology, integrates with the mineralized structure of the bone*



## the beginning of bone neogenesis

absorbable space maintainer

with synthesized carbonated nanohydroxyapatite:

- constitutes a center of nucleation for the formation of bone
- totally integrated with the new bone



*"Give me a place to stand  
and I can lift the world"*

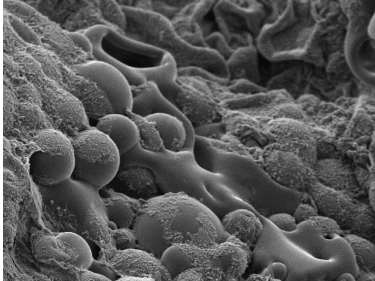
Archimedes from Siracusa (287 – 212 a.C)



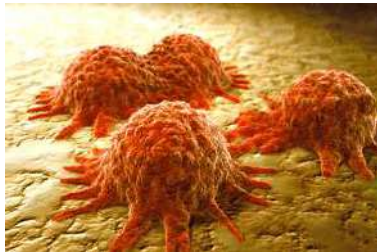
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# FISIOGRAFT nanoH.A.reinforced

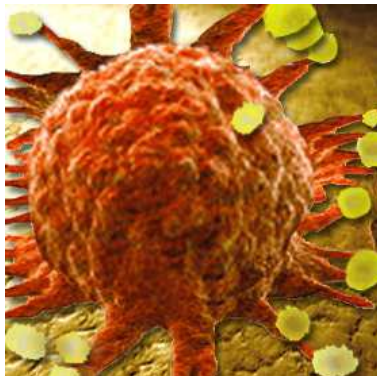
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SEM: culture of osteoblasts on nanohydroxyapatite



Osteoblasts adhere and proliferate optimally on the nanohydroxyapatite<sup>1</sup>



The hydroxyapatite produced by the osteoblasts joins with the nanohydroxyapatite.

## *Use nanotechnology of the future... today!*

This is the only nanohydroxyapatite that has structural, dimensional and biofunctional characteristics that replicate those of the natural hydroxyapatite present in the cementum and bone.

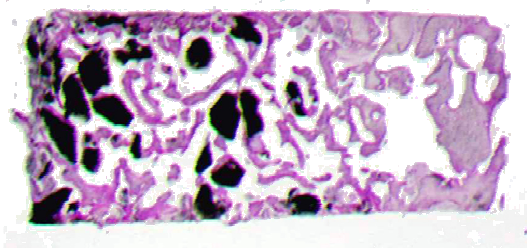
The granules of nanohydroxyapatite-dextran are smoothed to eliminate any sharp angles which may form after the granules are crushed, afterwards they pass through a calibrated filter to select particles with dimensions between 500 and 750  $\mu\text{m}$ .

## *Biomimicry and biofunctionality*

From a biological point of view, the rounded form of the granules is determinant since it improves the biofunctionality of the osteogenic cells, which show a preference for rounded surfaces.

Thanks to the characteristics of the nanometric dimension, the nanohydroxyapatite functions as a nucleus for the aggregation of hydroxyapatite produced first by the osteoblasts and then by the osteocytes.

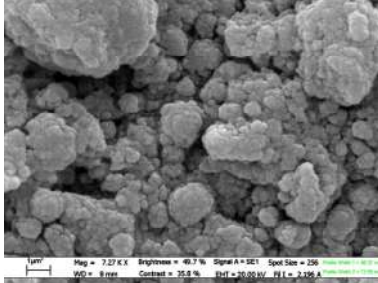
## *Certainty with the results*



The histomorphometric analysis of a core taken at the implant site 4 months after a major lift of the maxillary sinus shows:

- ❑ 42% of neoformed bone,
- ❑ 21% of nanohydroxyapatite
- ❑ 37% medullary spaces.

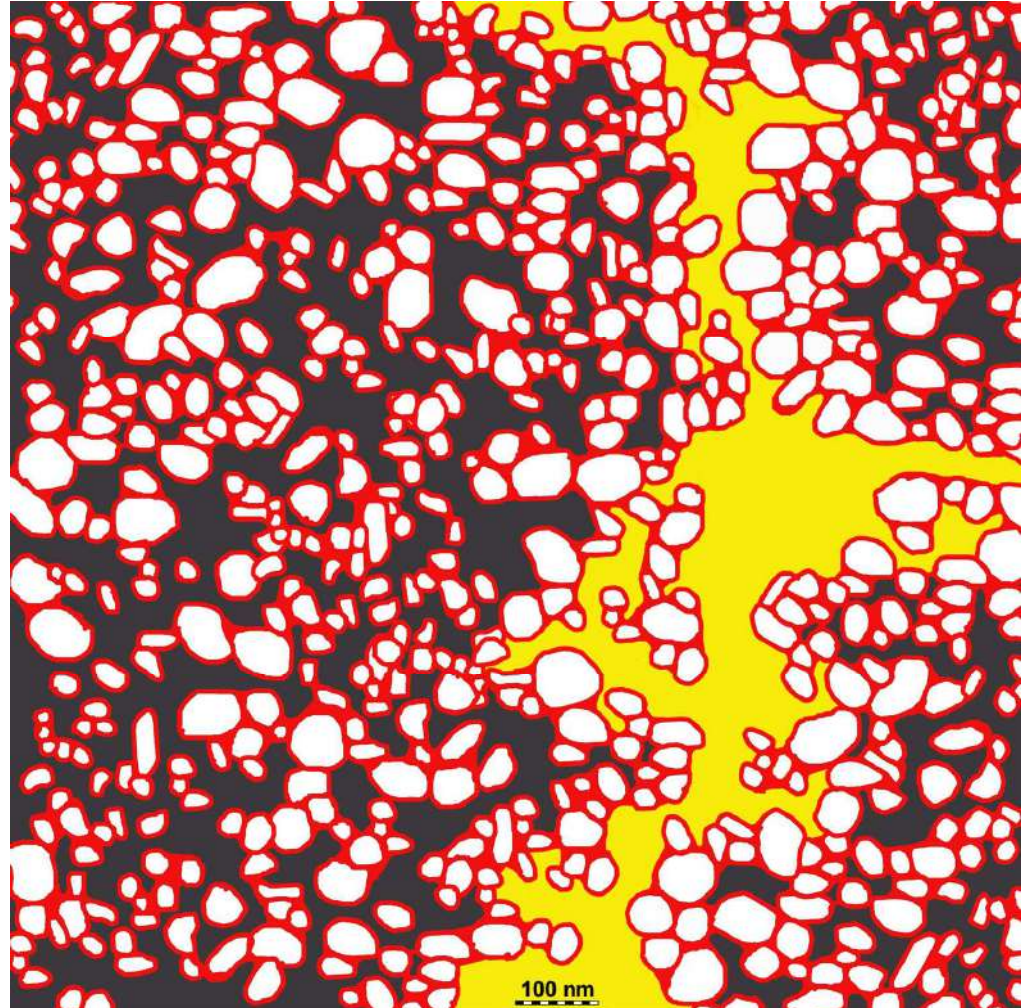
**42%**  
**of new bone**  
**after 4 months**





SEM photograph  
FISOGRAFT nanoH.A.reinforced




Ready-to-use syringe of  
FISOGRAFT nanoH.A.reinforced



 nanohydroxyapatite covered with dextran (red)

 mixture of polylactic and polyglycolic copolymers and polyethylene glycol (PEG)

 40-50% porosity inside the granules

#### The components of **FISOGRAFT nanoH.A.reinforced**

- a portion is partially absorbed to leave space for new bone: the polylactic and polyglycolic copolymers undergo hydrolysis and are degraded over a period of time (3-6 months), the dextran and polyethylene glycol are removed from the site by organic fluids within 7-15 days;
- the portion that is not absorbed, goes on to become nuclei of ossification for the hydroxyapatite produced by the osteoblasts: in fact, the particles of nanometric hydroxyapatite, for their dimensional and chemical-physical characteristics, remain at the site and constitute aggregation points for the hydroxyapatite produced by the osteoblasts, until they are completely incorporated by new bone.

## Method of application:

The syringe of **FISIOGRAFT nanoH.A.reinforced** is ready for use and does not require any preparation

*simplicity of use*

## indications

- ⇒ **implantology**
  - Post extraction sites
  - Dehiscences and bone defects
  - Major and minor augmentations of the maxillary sinus
- ⇒ **Periodontology**
  - Filling of pockets with one or two walls
  - Treatment of grade II forcation defects
- ⇒ **Oral surgery**
  - Post cystectomy defects, resections of the root apex and extractions of impacted teeth and/or multiple extractions

*In all the applications, fill the defect with **Fisiograft nanoH.A.reinforced** by compacting it, but not excessively,*

### **Clinical case of a surgical procedure - filling post extraction sites**



Post extraction alveoli 3.5 and 3.6. The yellow color is due to washing with tetracycline.



Filling is facilitated by the ready-to-use syringe of **FISIOGRAFT nanoH.A.reinforced**



Material in position before being compacted into the alveoli



Additional filling of the defect. The syringe makes filling the site very simple and easy.

*(Photos courtesy of dr. Bo)*

**The ready-to-use syringe of FISIOGRAFT nanoH.A.reinforced permits the product to be easily applied. The granules remain in position facilitating the surgical phases.**

### **Clinical case of a surgical procedure for treating bone defects**



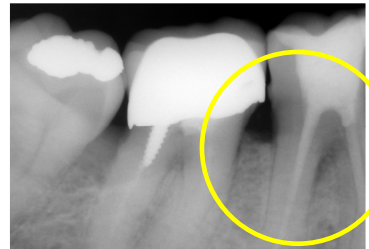
Rx Grade II forcation at 4.6



Probing the grade II forcation



Application of **Fisiograft nanoH.A.reinforced**



Rx Control at 3 months

*(Photos courtesy of prof. Andrea Pilloni and dr. Dominici)*

**A radiological control made only 3 months after the surgery shows in the forcation defect a pronounced radio-opacity. FISIOGRAFT nanoH.A.reinforced induced bone neogenesis even in this serious case of an advanced Grade II B class forcation.**

**Clinical case of a maxillary sinus floor elevation**



Rx pre-operative

Filling with Fisiograft nanoH.A.reinforced

Rx Control at 4 months

*(Photos courtesy of Dr. Andrea Samori)*

Application of the material facilitated by the ready-to-use syringe of **FISIOGRAFT nanoH.A.reinforced** (generally 2-3 syringes of product are needed), permits accelerating the surgical phases.

**OPM at 4 months shows the successful bone neogenesis of the floor of the sinus.**



Rx pre-operative

Filling with Fisiograft nanoH.A.reinforced

Rx Control at 4 months

Histology at 4 months of a core taken at the implant site

*(Photos courtesy of prof. Antonio Scarano)*

Confirming the evident radiological result, histomorphometric analysis shows the **presence of neoformed bone (42%), nanohydroxyapatite (21%) and medullary spaces (37%).**

**This result obtained with FISIOGRAFT nanoH.A.reinforced only 4 months after the surgery is similar to that obtained after 6-8 months with autologous bone or with other space maintainers, as described in the literature<sup>2,3</sup>.**



Rx Root fracture at 2.5 with a large circular defect

Rx Control at 3 months

Rx Control at 6 months

Rx control at 9 months: complete

*(Photos courtesy of dr. Vittorio Farina)*

The evolution of the radiological picture shows the formation of a progressively increasing radio-opacity at the defect site treated with **FISIOGRAFT nanoH.A.reinforced** as early as 3 months, with **complete bone regeneration after 9 months.**

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## BIBLIOGRAPHIC REFERENCES

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2. Orsini G, Piattelli A, Pecora G, Piattelli M, Degidi M, Tezzi G, Scarano A: Maxillary sinus augmentation with different biomaterials: a comparative histologic and histomorphometric study in man. 19<sup>th</sup> Annual Meeting of the Academy of Osseointegration. March 18-20, 2004. San Francisco, CA. Poster Presentation Abstracts: P-120
3. Piattelli A: Biomateriali utilizzati in rigenerazione ossea. Implantologia-Orale. 2003; 4: 77-80



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Archimedes from Siracusa (287 – 212 a.C)



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