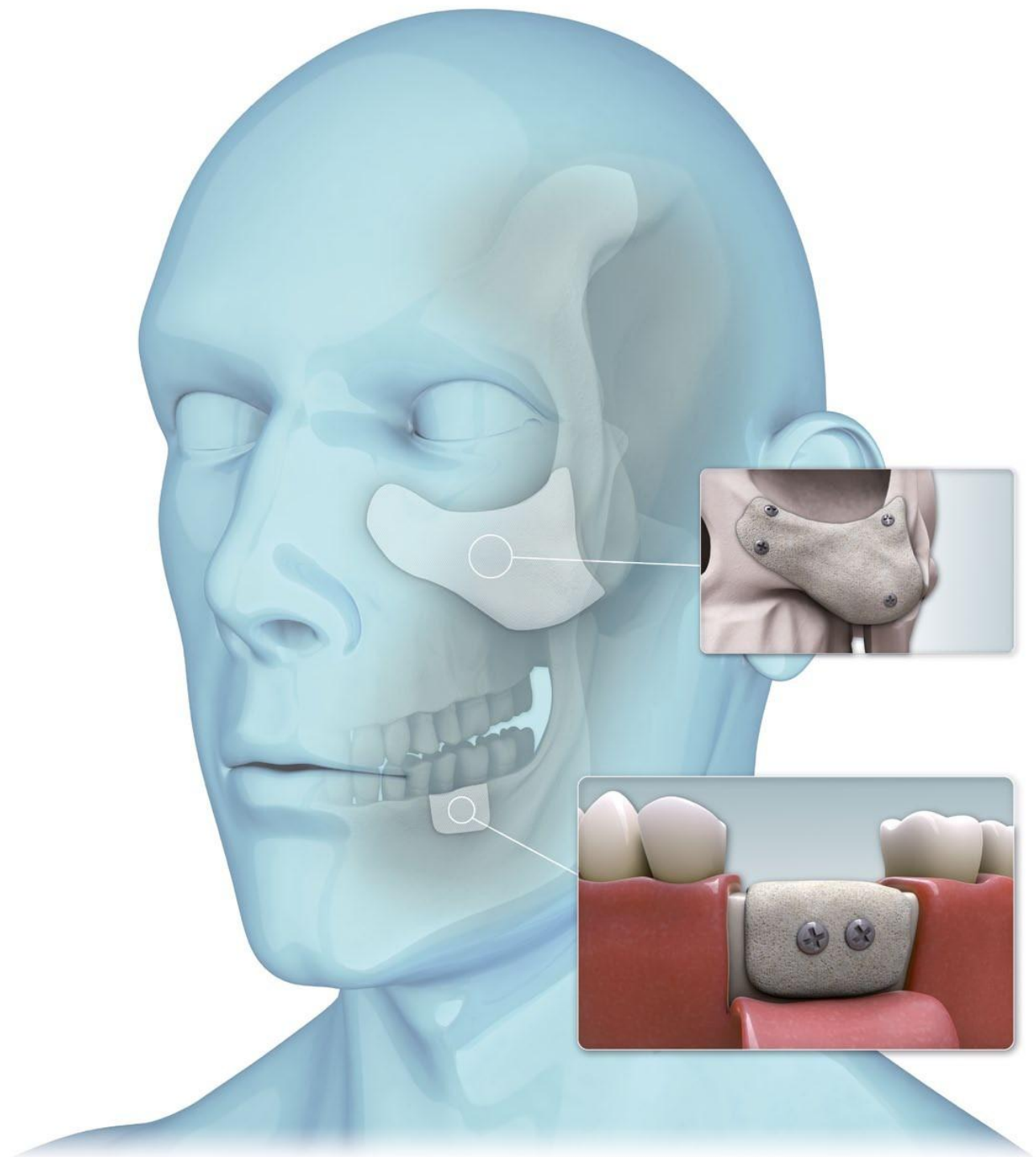


smartbone®

THE NEXT FRONTIER OF BONE
REGENERATION

Where Technology meets Nature

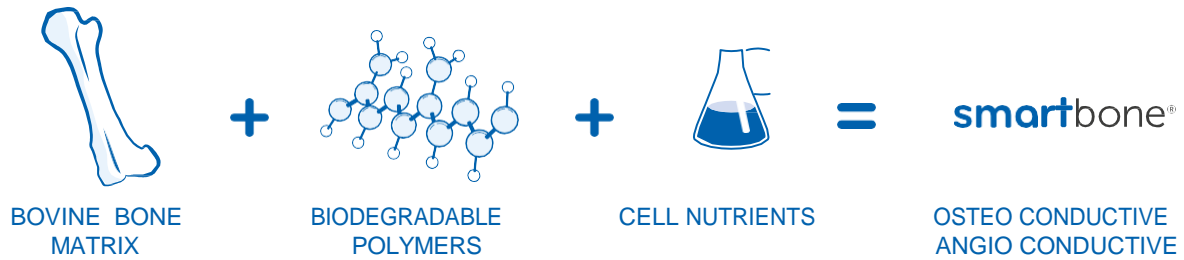


 swiss made 

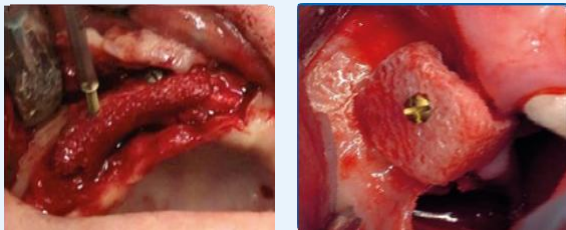
smartbone®

SmartBone is a new **hybrid bioactive** bone substitute specifically developed for **bone regeneration** in **reconstructive surgery**.

SmartBone is produced by combining a bovine mineral bone matrix with bioactive resorbable polymers and cell nutrients. This new concept of composite biomaterial promotes a quick growth of the patient's cells into SmartBone while its biopolymers degrade, providing perfect **integration** and **osteogenesis**.



BIODEGRADABLE POLYMERS



Give SmartBone:

- High loading resistance
- High volumetric stability (>95%); the polymers protect the bone from early resorption

CELL NUTRIENTS

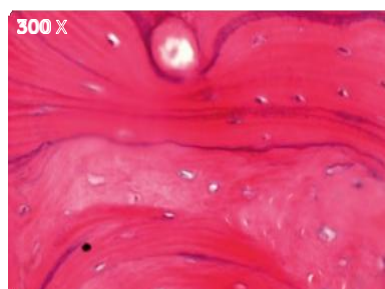


Help SmartBone to:

- promote blood cell adhesion and colonization
- guarantee high hydrophilicity thus enhancing the chemical cascade of signals that promotes the osteogenic process

smartbone®
PROMOTES

OSTEOINTEGRATION and VASCULARIZATION



Clinical case: 4 months after surgery

SmartBone is completely resorbed and replaced by the patient's own bone within 1-2 years: this excellent outcome grants a vital, functional bone-implant integration. SmartBone is extremely biocompatible and is fully compliant with **ISO10993-1** requirements.

PERFECT FOR:

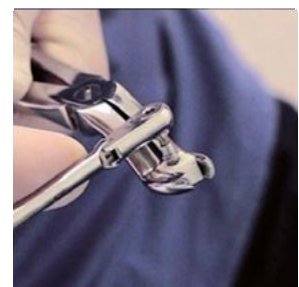
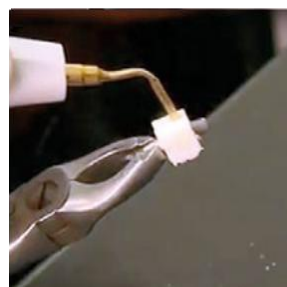
- Sinus lift procedures
- Intra bony defects
- Peri-implant defects
- Socket preservation
- Vertical and horizontal bone augmentations
- Craniofacial and maxillofacial applications
- Custom-made applications

FROM CHIPS TO CUSTOM-MADE GRAFTS



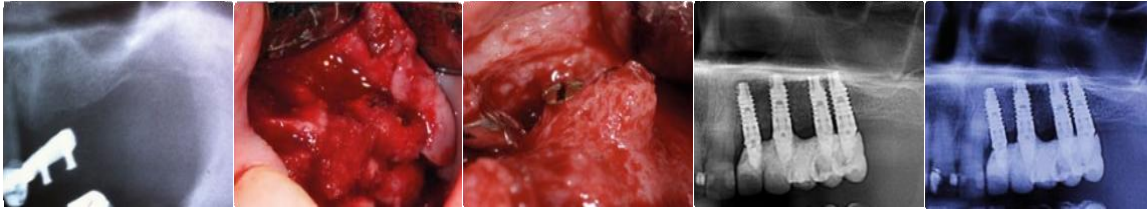
ADVANTAGES OF SMARTBONE BLOCKS:

- Easy dust free shaping with any type of surgical tool (bone cutter, drill, piezo)
- Resistant to extreme loads and to heavy surgical maneuvering
- Far better stability of the augmented bone graft vs the loose granules
- Strongly osteogenic
- Bigger defects do not need autologous bone, thus reducing the patient's morbidity
- No resorption: the polymeric coating protects the graft during the first healing / osteointegration period
- Readily absorb blood



smartbone® IN ACTION

Filling of a bone gap after extraction and vertical increase using SmartBone Block



Patient's initial conditions

Insertion of a cone shaped SmartBone in 23 and placement of Microchips(1-2mm) in position 22

4 months: the graft has maintained the volume and an excellent bone formation permits the placement off our implants

2 years: a complete bone maturation is achieved

3 years: the bone surrounding the implants has a very good quality and density

Lateral augmentation in 45-46 using SmartBone Block



Patient's initial conditions

Due to its high fixation tenacity, the block is fixed with two osteosynthesis screws to obtain a perfect primary stability

4 months: perfect three-dimensional bone reconstruction accompanied by an adequate bone density for the placement of two implants

2 years: a good osteointegration is achieved

3 years: the implants are surrounded by excellent bone quality

Large bone loss due to fracture treated using SmartBone Granules(2-4mm)



Patient's initial conditions

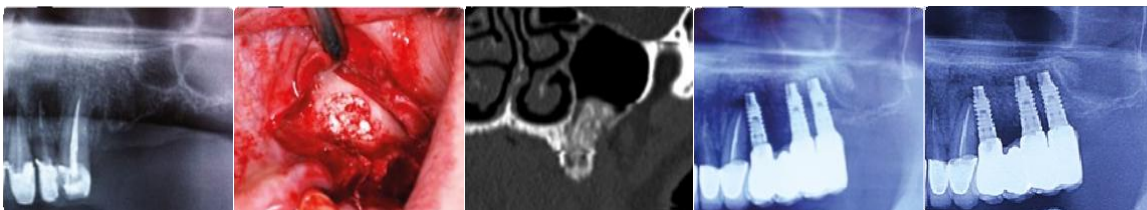
Filling of the defect with SmartBone Granules for bone augmentation and fast blood absorption

5 months: good bone regeneration for implant placement

8 months: Good osteointegration around the implant

2 years: perfect bone maturation and stable bone volume

Sinus lift and vertical bone augmentation using SmartBone Microchips(1-2mm)



Patient's initial conditions

SmartBone Microchips application both for sinus lift and vertical bone augmentation

5 months: average bone density 500 HU, adequate for the placement of three implants

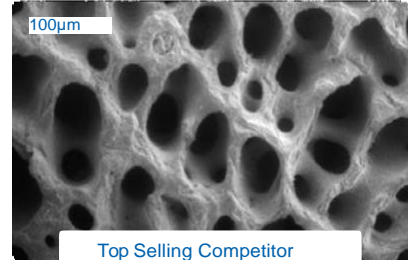
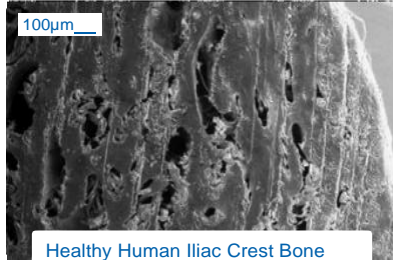
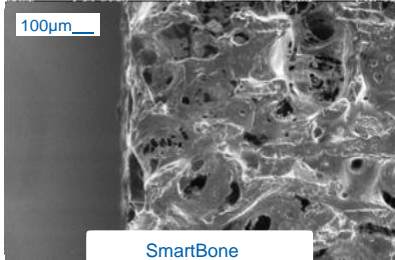
2 years: complete osteointegration and maturation of soft and hard-tissues

3 years: a very good bone quality around the implants ensures a perfect stability

KEY FEATURES

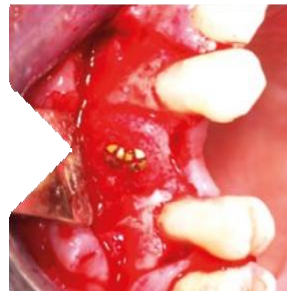
OPEN POROSITY AND MICROSTRUCTURE

The microstructure of SmartBone's composite matrix strongly resembles the human bone in terms of open and mid-sized 27% porosity.



HIGH MECHANICAL PERFORMANCES

SmartBone has a rigid pseudo elastic behaviour. It bears 3 times the competitor's maximum load and is 4 times more rigid.



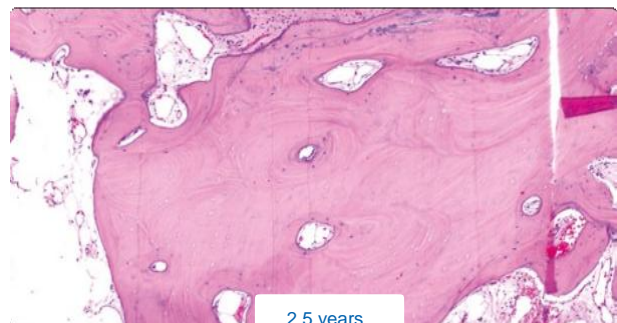
HIGH HYDROPHILICITY

Thanks to its micro composition, SmartBone quickly reaches an av.38%w/w blood swelling, thereby allowing a robust osteointegration.



HIGH TISSUE INTEGRATION

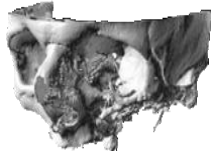
SmartBone's microstructure and composition favour cell colonization. The electronic microscopy analysis of invitro cell colonization tests evidenced the presence of wide and well-structured cell formations inside SmartBone.



SmartBone is progressively replaced by new young bone: osteoblasts are visible both in the active and in the quiescent state, when, after having formed mature lamellar bone, they become osteocytes, as evidenced inside the lacunae. After 2.5 years the graft has been completely replaced and the osteogenesis has formed a lamellar bone with cement lines; there is evidence of a great amount of osteocytes inside the lacunae and of a good angiogenesis. SmartBone combined with the native bone forms an osteoinductive system.

smartbone[®] on demand[™]

Custom made grafts for oral and maxillofacial reconstructive surgery are only four steps away



1.

DIAGNOSIS PRESCRIPTION

The doctor sends the patient's CTScan with a brief clinical description



2.

DIGITAL PLANNING

ANPA designs the graft.



3.

CUSTOM MADE BONE GRAFT

IBI produces the custom made graft based on the stl file



4.

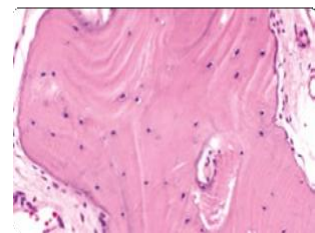
SURGERY

The doctor receives the graft and is ready for surgery



2.5 YEARS AFTER SURGERY

The graft has been completely replaced and a **mature lamellar bone** has formed



SMARTBONE ON DEMAND GUARANTEES YOUR SUCCESS:

- custom-made to the specific needs of each of your patients
- ensures a perfect contact between the graft and the recipient site for improved integration
- ensures a precise creation of the desired shape
- helps you to resolve complex situations
- Saves your time during surgery
- reduces your patient's risks
- helps you to reduce surgical costs



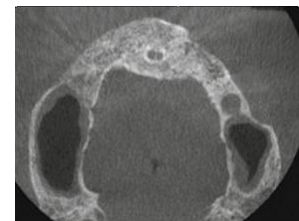
Digital planning



Surgery



Surgery



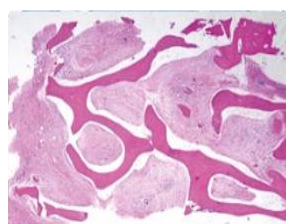
CTscan
8 months



Post-op
8 months



Implant placement
8 months



Histological analysis
8 months



Follow up
1 year