Nanocrystalline bone grafting material
Ready to use

Product Information
The jaw bone
Healthy jaw bone is constantly remodeled. Bone degrading osteoclasts and bone generating osteoblasts are in balance.

This balance can be disturbed, this may lead to atrophy, jaw bone is degenerating. This can originate from mechanical reasons or inflammation, tumors or hormone or metabolic reasons.

Regeneration of bone tissues can be supported as long as the physiological requirements for bone growth are existent.

Optimal blood supply is essential for regeneration of bone tissue. Vascularisation is a basic requirement for the immigration of osteoblasts and thus osteogenesis.

Why bone grafting material?
Bone augmentation material is always used if host bone is too slowly or not at all regenerating. This can be the case in small defects or in big cysts. In maxillofacial surgery we are talking about augmentation surgery for example of alveolar ridge or sinus.

Ideal bone replacement material is biocompatible, it is not recognised as foreign by the body which would result in an immune reaction. Autologous bone is the gold standard but not always sufficiently available.

Synthetic bone replacement materials should be as similar to the natural bone as possible. They should not be an obstacle for vascularisation or bone growth. They should form the scaffolding and be completely resorbable.

Ostim® – Innovative bone grafting material
Ostim is synthetically manufactured and comprises nanocrystalline hydroxyapatite. Thus it is chemically similar to the inorganic bone component. In comparison to other materials it is not sintered with a very high specific surface. The small particle size facilitates resorption. Ostim is an aqueous watery paste and can be used to fill bone defects or to build up bony structures in the region of the jaws. Ostim is osteoconductive, facilitating bone growth. It will act as a scaffolding for the new bone. Ostim is resorbed during the healing process, in the beginning it is osseously interweaved and finally replaced by natural bone.
Ostim is fast
Early vascularisation and fast bone regeneration occur within a few months.

Ostim is soft
Ostim is free from any material of biological origin (either animal or human), it is manufactured under sterile conditions and does not contain any preservatives. Immune reactions or transmission of disease can be excluded with high reliability.

Ostim is “Ready to Use”
Ostim is applied positively-fitting directly out of the Pre-filled Syringe (1 or 2 ml) or the Single Dosage (0.2 ml). It can be applied directly through any supportive system as for example a mesh. Ostim does not have to be mixed with patient blood prior to use. It does not have to be premoulded to the form of the defect as it adapts easily.
How to use Ostim®

To optimise bone growth all inflamed or necrotic tissue has to be removed prior to application of Ostim.

Contact to intact bone is essential to allow vascularisation and immigration of osteoblasts.

**Ostim is applied directly into the bone defect.**
No need for prior mixing with patient blood, neither for prior mulding to defect form – Ostim is applied directly from Syringe or Single Dosage into the defect, easily adapting to form of defect.

Ostim is volume stable, it stays inside the defect and will not be washed out by blood. Instead blood will impregnate the material and bring the growth factors essential for bone regeneration. This will result in reddish color. The new bone will grow right through the Ostim paste. Membrane should be used if tissue coverage is insufficient.

**Where is Ostim used?**
Indications
Ostim is intended as a filling or reconstruction material for repair of intraoral bony defects, jawbone and facial applications in the following indications:

- Filling of intraoral bony defects such as those resulting from cystectomies, root tip resections, extractions or surgical tooth removal.
- Augmentations in the area of the alveolar processes and maxillary sinuses (Sinus lift).
- Filling of periodontal defects.

Ostim is intended to remain in the defect until it is completely resorbed.
Resorption of Ostim
Ostim is not sintered, therefore it is made of miniscule nanoparticles which are easily resorbable. These nano­
crystals can be resorbed and degraded by phagozytosing cells as osteoclasts and macrophages.

Animal experiments show: In Ostim-filled defects macro­
phages and active osteoblasts cells are found in close
neighbourhood after a short time.

Depending on the region Ostim can be resorbed within a
few months, depending also on efficiency of vascularisa-
tion. Cells can only migrate in the implant if it is in con-
tact with vital bone. Therefore complete filling of bone
defect is important.

Ostim is available in the following packages

- Ostim Prefilled Syringes
  2 x 1 ml
  Order no.: 66009111

- Ostim Prefilled Syringes
  2 x 2 ml
  Order no.: 66009112

- Ostim Single Dosages
  5 x 0,2 ml
  Order no.: 66013202

- Single Dosage Applicator
  (stainless steel, easy to dismantle)
  Order no.: 66020348
Clinical Evaluation – Bone Formation
The clinical evaluation of Ostim clearly showed: Ostim is osteoconductive, bone formation is facilitated in critical size defects. After six months the newly formed bone is not discernible from the original bone.

1 Osteocytes with cell nucleus (dark blue)
2 Single Ostim residues are integrated in mineralised bone, almost completely resorbed
Ostim® is ...

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<thead>
<tr>
<th>Fast</th>
<th>Safe</th>
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<tbody>
<tr>
<td>Early revascularisation and bone regeneration within few months</td>
<td>Nanocrystalline hydroxypatite, synthetically manufactured, well tolerated</td>
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<tr>
<th>Biocompatible</th>
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<td>Ostim is free from substances of biological origin (animal or human) and free from preservatives</td>
<td>Application out of Prefilled Syringe or Single Dosage directly into the defect</td>
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If you are interested, you can order the following scientific information on Ostim:

- **Comparative Characterization of Stimulants of Repair Osteogenesis in the Treatment of Periodontal Disease**
  Zuyev, Dmitrieva et al., 1996
  Order no.: 00100277

- **Use of Ultrahighly Dispersed Hydroxypatite in the Complex Treatment of Patients with Mandibular Fractures**
  Pankratov, Zuyev et al., 1995
  Order no.: 00100273

- **Surgical Treatment of Cysts of the Jaw Using Ultrahighly Dispersed Hydroxyapatite**
  Bezrukov, Grigoryants et al., 1998
  Order no.: 00100269

- **Treatment of Jaw Cysts with a New Nanoparticle Hydroxyapatite**
  Gerlach & Niehues, 2004
  Order no.: 00100271

- **Studies of Bone Regeneration of Osseous Defects by Using a Nanoparticular Hydroxyapatite (Ostim)**
  Thorwarth Schlegel et al., 2004
  Order no.: 00100275