

Tigran runs an extensive clinical development program focusing on the dental applications peri-implantitis, sinus lift, onlay etcetera where PTG (Porous Titanium Granules) has proved its excellence for bone regeneration and implant re-osseointegration. In addition, the capacity of PTG in periodontal defects is investigated in initial studies. A number of clinical and experimental trials have been completed and Tigran sponsors several ongoing studies.

For further details and key morphological findings, please refer to www.tigran.se

Initial Human Experience

1. Holmberg L, Forsgren L, Kristerson L. **Porous titanium granules for implant stability and bone regeneration – a case followed for 12 years.** Ups J Med Sci 2008;113(2):217–20.
2. Magistri A, Botticelli L, Romitelli AM, De Luca P, Evangelisti N, Guadagno I. **Trattamento delle grandi cavità cistiche con biomateriali [Treatment of large cystic cavities with biomaterial].** ChirOrale 2006;2(2):16–9.

Sinus Floor Augmentation

3. Bystedt H. **Natix used as osteoconductive material for sinus floor augmentation. Three years follow-up.** Case report. Swed Dent J 2007;31(4):193.
4. Bystedt H, Rasmusson L. **Porous titanium granules used as osteoconductive material for sinus floor augmentation: a clinical pilot study.** Clin Implant Dent Relat Res 2009;11(2):101–5.
5. Lambert F, Lecloux G, Léonard A, Sourice S, Layrolle P, Rompen E. **Bone regeneration using porous titanium particles versus bovine hydroxyapatite: a sinus lift study in rabbits.** Clin Implant Dent Relat Res (Epub 2011 ahead of print).

Peri-implantitis and Osseous Regeneration

6. Wohlfahrt JC, Aass AM, Rønold HJ, Karlsson S, Ellingsen JE, Saxegaard E, Lyngstadaas SP. **Porous titanium granules in the surgical treatment of peri-implant osseous defects – a randomized clinical trial.** Int J Oral Maxillofac Implants (Accepted for publication).
7. Frei B, Steveling H, Mertens C. **Porous titanium granules for bone regeneration in peri-implantitis-related defects.** Clin Oral Impl Res 2010;21(10):1146.
8. Bergmann F. a) **Ein neues Konzept bei Periimplantitis. Vorgehen mittels aPDT und knochenregenerativ augmentativen Maßnahmen.** Implantologie Journal 2010;14(6):36–9. b) **A new treatment concept for peri-implantitis. Photodynamic therapy and regenerative bone augmentation.** European Journal for Dental Implantologists 2010;6(4):66–9.
9. Gholami GA, Amid R, Aghaloo M. **Management of peri-implant bone loss occurred during osseointegration phase with porous titanium granules.** Clin Oral Impl Res 2011;22(9):1021.
10. Wohlfahrt JC, Aass AM, Rønold HJ, Lyngstadaas SP. **Micro-CT and human histological analysis of a peri-implant osseous defect grafted with porous titanium granules: a case report.** Int J Oral Maxillofac Implants 2011;26(1):e9–e14.

Onlay Augmentation

11. Steveling H, Mertens C. **Konturverbesserung des Alveolarfortsatzes durch Titangranulat. [Titanium granules for contour enhancement of the alveolar process].** Zahnarzt & Praxis 2011;14(Sonderausgabe Implantologie):6–9.



Tigran™ Scientific Evidence



Periodontitis

12. Wohlfahrt JC, Aass AM, Rønold HJ, Heijl L, Haugen HJ, Lyngstadaas SP. **Microcomputed tomographic and histologic analysis of animal experimental degree II furcation defects treated with porous titanium granules or deproteinized bovine bone.** J Periodontol. 2012;83(2):211-21.

13. Wohlfahrt JC, Lyngstadaas SP, Heijl L, Aass AM. **Porous titanium granules in the treatment of mandibular class II furcation defects – a consecutive case series.** J Periodontol 2012;83(1):61-9.

Other Applications

14. Wohlfahrt JC, Monjo M, Rønold HJ, Aass AM, Ellingsen JE, Lyngstadaas SP. **Porous titanium granules promote bone healing and growth in rabbit tibia peri-implant osseous defects.** Clin Oral Implants Res 2010;21(2):165-73.

15. Gholami GA, Tehranchi M, Kadkhodazadeh M, Moghadam AA, Ghanavati F, Ardakani MRTA, Aghaloo M, Mashhadiabbas F. **Histologic and histomorphometric evaluation of bone substitutes in experimental defects.** Research Journal of Biological Sciences 2010;5(7):465-9.

16. Bashara H, Wohlfahrt JC, Polyzois I, Lyngstadaas SP, Renvert S, Claffey N. **The effect of permanent grafting materials on the preservation of the buccal bone plate after tooth extraction. An experimental study in the dog.** Clin Oral Implants Res (Epub 2011 ahead of print).

17. Wohlfahrt C, Lundberg E, Bjursten LM. **Drilling and placing of implants in bone grafted with porous titanium granules does not cause overheating or technical complication.** Presented at the Third Annual Meeting of the Scandinavian Society for Biomaterials, April 14-16, 2010, Hafjell, Norway.

18. Verket A, Lyngstadaas SP, Rønold HJ, Wohlfahrt JC. **Implants inserted in extraction sockets grafted with porous titanium granules.** Presented at the 89th General Session of the International Association of Dental Research, March 16-19, 2011, San Diego, California.

In-vitro Experiments

19. Sabetrasekh R, Tiainen H, Lyngstadaas SP, Reseland J, Haugen H. **A novel ultra-porous titanium dioxide ceramic with excellent biocompatibility.** J Biomater Appl 2011;25(6):559-80.

20. Duddeck DU, Karapetian VE, Faber FJ, Rothamel D, Zöllner JE. **Effects of rotating titanium debridement brushes on the surface structure of dental implants.** Presented at the 20th Annual Scientific Meeting of the European Association for Osseointegration, October 13-15, 2011, Athens, Greece.

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