OsteoBiol®
by Tecnoss

Gen-Os

A DUAL-PHASE BIOMATERIAL

Collagenated heterologous cortico-cancellous bone mix

REGENERATION SCIENCE

INSPIRED BY NATURE

A unique biotechnology

TECNOSS®: A UNIQUE PROCESS THAT ACCELERATES AND GUIDES NATURAL BONE REGENERATION

Tecnoss® developed and patented a unique biotechnology that prevents the ceramization phase of natural bone and preserves the tissue collagen, allowing an osteoclastic-type remodelling of the biomaterial similar to physiological bone turnover and delivering a product endowed with characteristics very similar to human mineral bone[1].

The combination of these factors allows a consistent new bone formation and a close contact between neo-formed bone and biomaterial granules[A].

COLLAGEN: A KEY FACTOR FOR BONE REGENERATION

Collagen has a key role in bone regeneration process in that:

a) it acts as a valid substrate for platelet activation and aggregation
b) it serves to attract and differentiate the mesenchymal stem cells present in the bone marrow[2]
c) it increases the proliferation rate of the osteoblasts up to 2/3 times[3]
d) it stimulates the activation of the platelets, osteoblasts and osteoclasts in the tissue healing process

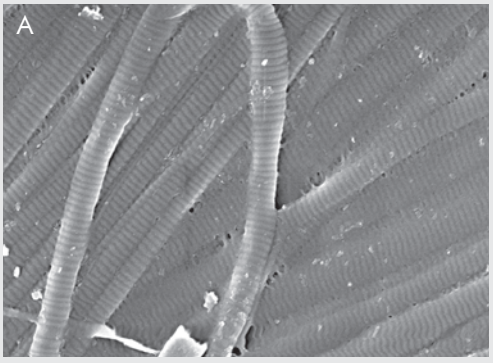
OSTEOBIOL®: UNIQUE COLLAGENATED BIOMATERIALS

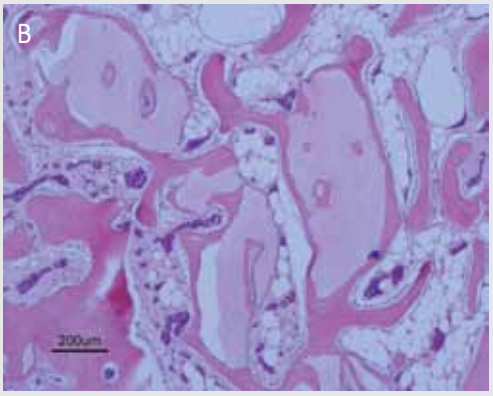
Thanks to the innovative Tecnoss® technology, the OsteoBiol® line has the following important characteristics:

1) absence of a foreign body response
2) gradual resorption over time[4]
3) stimulation/acceleration of physiological tissue healing process
4) protection of the grafting site from infection (membranes)

The Tecnoss® new generation of biomaterials, thanks to a revolutionary technology, goes beyond the simple role of aiding natural bone regrowth by stimulating and accelerating this vital physiological process.

OsteoBiol® by Tecnoss





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A | Courtesy of Dr Ulf Nannmark, Göteborg University, Sweden
B | Histology of bone grafted with Gen-Os. Courtesy of Dr. U Nannmark, University of Göteborg, Sweden
C | Gen-Os vial

1 | Figueiredo M et al. J Biomed Mater Res B Appl Biomater, 2009
2 | Salasznyk RM, et al. J Biomed Biotechnol, 2004
3 | Hsu FY, et al. Biomaterials, 1999
4 | Nannmark U, Sennerby L. Clin Implant Dent Relat Res, 2008
5 | Cardaropoli D et al Int J Periodontics Restorative Dent, 2008
6 | Barone A et al Int J Oral Maxillofac Surg, 2005
7 | Barone A et al Int J Oral Maxillofac Surg, 2006
8 | Vozza I et al Int J Osteointegration, 2004
9 | Covani U et al J Periodontology, 2006

A dual-phase biomaterial

CHARACTERISTICS

A natural replicate of autologous bone, *Gen-Os* conserves the same intimate structures (matrix and porous form) and presents a high osteoconductive activity. It is biocompatible and bioavailable, as recognized by tests made according to the ISO 10993 method conducted at the Università degli Studi di Torino.

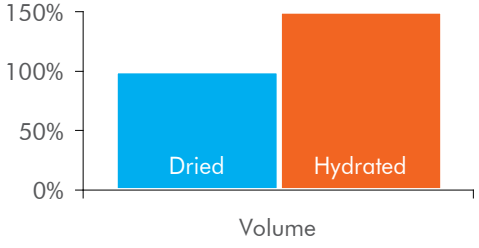
Gen-Os is gradually resorbable and provides support in bone neoformation helping to preserve the original graft shape and volume (osteoconductive property).

Moreover, thanks to its collagen content, the product facilitates blood clotting and the subsequent invasion of repairing and regenerative cells, favoring *restitutio ad integrum* of missing bone.

Because of its marked hydrophilicity, it can function as a carrier for selected medication and drugs.

HANDLING

Gen-Os must always be hydrated and thoroughly mixed with a few drops of sterile physiological solution to activate its collagen matrix and to enhance its adhesivity; it can also be mixed with patient's blood.



OsteoBiol® *Gen-Os*
Source: Tecnoss s.r.l.

Gen-Os expands up to 50% in volume after hydration with sterile saline: hydrated collagen contained in each granule also increases sensibily biomaterial adhesivity.

CLINICAL INDICATIONS OVERVIEW

Gen-Os has been successfully used and documented for alveolar ridge preservation[5] in combination with *Evolution* membranes. *Gen-Os* is also indicated for lateral access maxillary sinus lift[6-8] and dehiscence regeneration[9], always in association with *Evolution* membranes.

Ongoing studies are also proving its effectiveness in periodontal regeneration of deep intrabony defects. Due to its collagen content, once hydrated *Gen-Os* becomes very sticky and hydrophylic: it combines therefore extremely well with blood and is very stable once applied into the grafting site. Its cortico-cancellous composition allows a progressive resorption of osteoclastic type, with in parallel a similar rate of new bone formation[4]: these unique properties allow a very good graft volume preservation, a healthy new bony tissue and ultimately, a successful implant rehabilitation.

Tissue of origin
Cortico-cancellous heterologous bone mix

Tissue collagen
Preserved

Physical form
Slightly radiopaque granules

Composition
100% granulated mix

Thickness
250-1000 μm

Re-entry time
4/5 months, depending on grafting site characteristics

Packaging
Vial: 0.25 g, 0.5 g, 1.0 g, 2.0 g


INTRABONY DEFECTS


POST-EXTRACTIVE SOCKETS


CRESTAL AND LATERAL ACCESS SINUS LIFT


TWO-WALL DEFECTS

Excellent clinical performances


Fig. 1


Fig. 2


Fig. 3

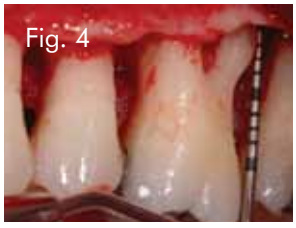


Fig. 4


Fig. 6


Fig. 5


Fig. 7


Fig. 8


Fig. 9


Fig. 10


Fig. 12


Fig. 11

CASE REPORT

■ INTRABONY DEFECTS

Periodontal regeneration

Sex: **female** | Age: **30**

Fig. 1 Pre-operative x-ray

Fig. 2 Initial clinical situation

Fig. 3 Probing intrabony defect

Fig. 4 Buccal furcation on 2.6 is also present

Fig. 5 Furcation and defect grafted with OsteoBiol® *Gen-Os*

Fig. 6 Completion of grafting with OsteoBiol® *Gen-Os*

Fig. 7 Grafting site protected with OsteoBiol® *Evolution* collagen membrane

Fig. 8 Collagen membrane double layer

Fig. 9 Coronally positioned flap: buccal view

Fig. 10 Sutures: palatal view

Fig. 11 Clinical situation at 12 months

Fig. 12 Control x-ray at 36 months

Documentation provided by
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Bone substitute: **OsteoBiol® *Gen-Os***
Membrane: **OsteoBiol® *Evolution***

Scientific publications

Covani U, Ameri S, Crespi R, Barone A
PRESERVAZIONE DEL PROCESSO ALVEOLARE CON OSSO ETEROLOGO. CONSIDERAZIONI ISTOLOGICHE
ITALIAN ORAL SURGERY, 2004, vol 3, 1: 17-23

Cassetta M, Calasso S, Vozza I, Dell'Aquila D
REHABILITATION OF ATROPHIC ALVEOLAR CRESTS WITH CYLINDRICAL SANDBLASTED AND ACID ETCHED IMPLANTS: A PILOT STUDY
EUROPEAN JOURNAL OF IMPLANT PROSTHODONTICS, 2005; (3)1:133-144

Arcuri C, Cecchetti F, Germano F, Motta A, Santacroce C
CLINICAL AND HISTOLOGICAL STUDY OF A XENOGENIC BONE SUBSTITUTE USED AS A FILLER IN POSTEXTRACTIVE ALVEOLUS
MINERVA STOMATOLOGICA, 2005 Jun;54(6):351-62

Barone A, Crespi R, Aldini NN, Fini M, Giardino R, Covani U
MAXILLARY SINUS AUGMENTATION: HISTOLOGIC AND HISTOMORPHOMETRIC ANALYSIS
INTERNATIONAL JOURNAL OF ORAL AND MAXILLOFACIAL IMPLANTS, 2005 Jul-Aug;20(4):519-25

Rinna C, Ungari C, Saltarel A, Cassoni A, Reale G
ORBITAL FLOOR RESTORATION
JOURNAL OF CRANIOFACIAL SURGERY, 2005 Nov;16(6):968-72

Barone A, Ameri S, Covani U
IMMEDIATE POSTEXTRACTION IMPLANTS: TREATMENT OF RESIDUAL PERI-IMPLANT DEFECTS. A RETROSPECTIVE ANALYSIS
EUROPEAN JOURNAL OF IMPLANT PROSTHODONTICS, 2006, 2: 99-106

Barone A, Santini S, Sbordone L, Crespi R, Covani U
A CLINICAL STUDY OF THE OUTCOMES AND COMPLICATIONS ASSOCIATED WITH MAXILLARY SINUS AUGMENTATION
INTERNATIONAL JOURNAL OF ORAL AND MAXILLOFACIAL IMPLANTS, 2006 Jan-Feb;21(1):81-5

Covani U, Barone A, Cornelini R, Crespi R
CLINICAL OUTCOME OF IMPLANTS PLACED IMMEDIATELY AFTER IMPLANT REMOVAL
JOURNAL OF PERIODONTOLOGY, 2006 Apr;77(4):722-7

Orsini G, Scarano A, Piattelli M, Piccirilli M, Caputi S, Piattelli A
HISTOLOGIC AND ULTRASTRUCTURAL ANALYSIS OF REGENERATED BONE IN MAXILLARY SINUS AUGMENTATION USING A PORCINE BONE-DERIVED BIOMATERIAL
JOURNAL OF PERIODONTOLOGY, 2006 Dec;77(12):1984-90

Trubiani O, Scarano A, Orsini G, Di Iorio D, D'Arcangelo C, Piccirilli M, Sigismondo M, Caputi S
THE PERFORMANCE OF HUMAN PERIODONTAL LIGAMENT MESENCHYMAL STEM CELLS ON XENOGENIC BIOMATERIALS
INTERNATIONAL JOURNAL OF IMMUNOPATHOLOGY AND PHARMACOLOGY, 2007 Jan-Mar;20(1 Suppl 1):87-91

Barone A, Covani U
MAXILLARY ALVEOLAR RIDGE RECONSTRUCTION WITH NONVASCULARIZED AUTOGENOUS BLOCK BONE: CLINICAL RESULTS
JOURNAL OF ORAL AND MAXILLOFACIAL SURGERY, 2007 Oct;65(10):2039-46

Calvo Guirado JL, Pardo Zamora G, Saez Yuguero MR
RIDGE SPLITTING TECHNIQUE IN ATROPHIC ANTERIOR MAXILLA WITH IMMEDIATE IMPLANTS, BONE REGENERATION AND IMMEDIATE TEMPORISATION: A CASE REPORT
JOURNAL OF IRISH DENTAL ASSOCIATION, 2007 Winter;53(4):187-90

Del Corso M
SOFT TISSUE RESPONSE TO PLATELET RICH FIBRIN: CLINICAL EVIDENCES
COSMETIC DENTISTRY, 2008, 3: 16-20

Barone A, Santini S, Marconcini S, Giacomelli L, Gherlone E, Covani U
OSTEOTOMY AND MEMBRANE ELEVATION DURING THE MAXILLARY SINUS AUGMENTATION PROCEDURE. A COMPARATIVE STUDY: PIEZOELECTRIC DEVICE VS. CONVENTIONAL ROTATIVE INSTRUMENTS
CLINICAL ORAL IMPLANTS RESEARCH, 2008 May;19(5):511-5. Epub 2008

Barone A, Cornelini R, Ciaglia R, Covani U
IMPLANT PLACEMENT IN FRESH EXTRACTION SOCKETS AND SIMULTANEOUS OSTEOTOME SINUS FLOOR ELEVATION: A CASE SERIES
INTERNATIONAL JOURNAL OF PERIODONTICS AND RESTORATIVE DENTISTRY, 2008 Jun;28(3):283-9

Barone A, Aldini NN, Fini M, Giardino R, Calvo Guirado JL, Covani U
XENOGRAFT VERSUS EXTRACTION ALONE FOR RIDGE PRESERVATION AFTER TOOTH REMOVAL: A CLINICAL AND HISTOMORPHOMETRIC STUDY
JOURNAL OF PERIODONTOLOGY, 2008 Aug;79(8):1370-7

Covani U, Cornelini R, Barone A
BUCCAL BONE AUGMENTATION AROUND IMMEDIATE IMPLANTS WITH AND WITHOUT FLAP ELEVATION: A MODIFIED APPROACH
INTERNATIONAL JOURNAL OF ORAL AND MAXILLOFACIAL IMPLANTS, 2008 Sep-Oct;23(5):841-6

Cardaropoli D, Cardaropoli G
PRESERVATION OF THE POSTEXTRACTION ALVEOLAR RIDGE: A CLINICAL AND HISTOLOGIC STUDY
INTERNATIONAL JOURNAL OF PERIODONTICS AND RESTORATIVE DENTISTRY, 2008 Oct;28(5):469-77

Nannmark U, Sennerby L
THE BONE TISSUE RESPONSES TO PREHYDRATED AND COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS: A STUDY IN RABBIT MAXILLARY DEFECTS
CLINICAL IMPLANT DENTISTRY AND RELATED RESEARCH, 2008 Dec;10(4):264-70

Scarano A, Piattelli A, Perrotti V, Manzon L, Iezzi G
MAXILLARY SINUS AUGMENTATION IN HUMANS USING CORTICAL PORCINE BONE: A HISTOLOGICAL AND HISTOMORPHOMETRICAL EVALUATION AFTER 4 AND 6 MTH
CLINICAL IMPLANT DENTISTRY AND RELATED RESEARCH, 2009

Perrotti V, Nicholls BM
RESORPTION PATTERN OF A PORCINE-DERIVED BONE SUBSTITUTE
JOURNAL OF OSSEOINTEGRATION, 2009

Calvo Guirado JL, Gomez Moreno G, Barone A, Cutando A, Alcaraz-Baños M, Chiva F, Lopez Mari L, Guardia J
MELATONIN PLUS PORCINE BONE ON DISCRETE CALCIUM DEPOSIT IMPLANT SURFACE STIMULATES OSTEOINTEGRATION IN DENTAL IMPLANTS
JOURNAL OF PINEAL RESEARCH, 2009, 47(2):164-72

Scarano A, Piattelli M, Carinci F, Perrotti V
REMOVAL, AFTER 7 YEARS, OF AN IMPLANT DISPLACED INTO THE MAXILLARY SINUS. A CLINICAL AND HISTOLOGIC CASE REPORT
JOURNAL OF OSSEOINTEGRATION, 2009

Covani U, Marconcini S, Crespi R, Barone A
IMMEDIATE IMPLANT PLACEMENT AFTER REMOVAL OF A FAILED IMPLANT: A CLINICAL AND HISTOLOGICAL CASE REPORT
JOURNAL OF ORAL IMPLANTOLOGY, 2009; 35(4):189-95

Calvo Guirado JL, Gomez Moreno G, Lopez Mari L, Ortiz Ruiz AJ, Guardia J
ATRAUMATIC MAXILLARY SINUS ELEVATION USING THREADED BONE DILATORS FOR IMMEDIATE IMPLANTS. A THREE-YEAR CLINICAL STUDY
MEDICINA ORAL, PATOLOGIA ORAL Y CIRUGIA BUCAL, Epub 2010

Figueiredo M, Henriques J, Martins G, Guerra F, Judas F, Figueiredo H
PHYSICOCHEMICAL CHARACTERIZATION OF BIOMATERIALS COMMONLY USED IN DENTISTRY AS BONE SUBSTITUTES – COMPARISON WITH HUMAN BONE
JOURNAL OF BIOMEDICAL MATERIALS RESEARCH PART B: APPLIED BIOMATERIALS, Epub 10 November 2009 in Wiley InterScience

Grenga PL, Reale G, Cofone C, Meduri A, Ceruti P, Grenga R
HESS AREA RATIO AND DIPLOPIA: EVALUATION OF 30 PATIENTS UNDERGOING SURGICAL REPAIR FOR ORBITAL BLOW-OUT FRACTURE
OPHTHALMIC PLASTIC AND RECONSTRUCTIVE SURGERY, 2009; 25(2)

Crespi R, Capparè P, Gherlone E
DENTAL IMPLANTS PLACED IN EXTRACTION SITES GRAFTED WITH DIFFERENT BONE SUBSTITUTES: RADIOGRAPHIC EVALUATION AT 24 MONTHS
JOURNAL OF PERIODONTOLOGY, 2009 Oct; 80(10):1616-1621

Rinna C, Reale G, Foresta E, Mustazza MC
MEDIAL ORBITAL WALL RECONSTRUCTION WITH SWINE BONE CORTEX
THE JOURNAL OF CRANIOFACIAL SURGERY, 2009; 20(3)

Cardaropoli D, Cardaropoli G
HEALING OF GINGIVAL RECESSIONS USING A COLLAGEN MEMBRANE WITH A HEMINERALIZED XENOGRAFT: A RANDOMIZED CONTROLLED CLINICAL TRIAL
INTERNATIONAL JOURNAL OF PERIODONTICS AND RESTORATIVE DENTISTRY, 2009 Feb;29(1):59-67

Nannmark U, Azarmehr I
SHORT COMMUNICATION: COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS. A STUDY IN RABBIT MAXILLARY DEFECTS
CLINICAL IMPLANT DENTISTRY AND RELATED RESEARCH, Epub 2010

Barone A, Ricci M, Covani U, Nannmark U, Azarmehr I, Calvo-Guirado JL
MAXILLARY SINUS AUGMENTATION USING PREHYDRATED CORTICO-CANCELLOUS PORCINE BONE: HYSTOMORPHOMETRIC EVALUATION AFTER 6 MTH
CLINICAL IMPLANT DENTISTRY AND RELATED RESEARCH, Epub 2010

Calvo Guirado JL, Gomez Moreno G, Lopez Mari L, Guardia J, Marinez Gonzalez JM, Barone A, Tresguerres IF, Paredes SD, Fuentes Breto L
ACTIONS OF MELATONIN MIXED WITH COLLAGENIZED PORCINE BONE VERSUS PORCINE BONE ONLY ON OSTEOINTEGRATION OF DENTAL IMPLANTS
JOURNAL OF PINEAL RESEARCH, 2010; 48:194-203

Scarano A, Piattelli A, Assenza B, Quaranta A, Perrotti V, Piattelli M, Iezzi G
PORCINE BONE USED IN SINUS AUGMENTATION PROCEDURES: A 5-YEAR RETROSPECTIVE CLINICAL EVALUATION
JOURNAL OF ORAL AND MAXILLOFACIAL SURGERY, Epub 2010

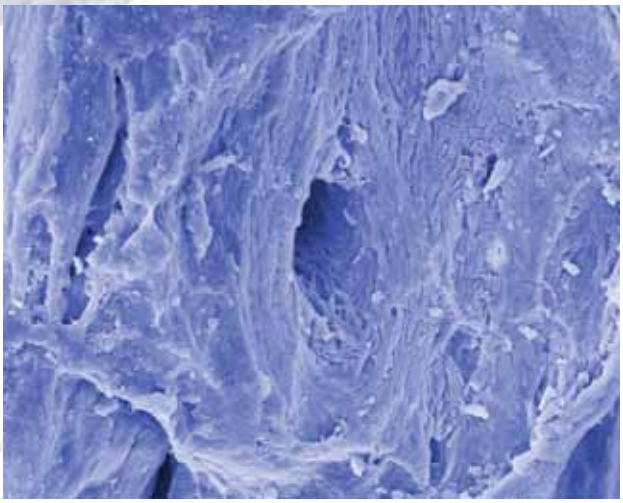
Rossi R, Morales RS, Frascaria M, Benzi R, Squadrito N
PLANNING IMPLANTS IN THE ESTHETIC ZONE USING A NEW IMPLANT 3D NAVIGATION SYSTEM
THE EUROPEAN JOURNAL OF ESTHETIC DENTISTRY, 2010; 5:172-187

Barone A, Orlando B, Tonelli P, Covani U
SURVIVAL RATE FOR IMPLANTS PLACED IN THE POSTERIOR MAXILLA WITH AND WITHOUT SINUS AUGMENTATION: A COMPARATIVE COHORT STUDY
JOURNAL OF PERIODONTOLOGY, Epub 2010

Scarano A, Carinci F, Assenza B, Piattelli M, Murmura G, Piattelli A
VERTICAL RIDGE AUGMENTATION OF ATROPHIC POSTERIOR MANDIBLE USING AN INLAY TECHNIQUE WITH A XENOGRAFT WITHOUT MINISCREWS AND MINIPLATES: CASE SERIES
In press 2010

Pagliani L, Andersson P, Lanza M, Nappo A, Verrocchi D, Volpe S, Sennerby L
A COLLAGENATED PORCINE BONE SUBSTITUTE FOR AUGMENTATION AT NEOSS IMPLANT SITES: A PROSPECTIVE 1-YEAR MULTICENTER CASE SERIES STUDY WITH HISTOLOGY
CLINICAL IMPLANT DENTISTRY AND RELATED RESEARCH, Epub 2010

Santagata M, Guariniello L, Tartaro G
A MODIFIED EDENTULOUS RIDGE EXPANSION (MERE) TECHNIQUE FOR IMMEDIATE PLACEMENT OF IMPLANTS. A CASE REPORT
THE INTERNATIONAL JOURNAL OF ORAL IMPLANTOLOGY, Epub 2010



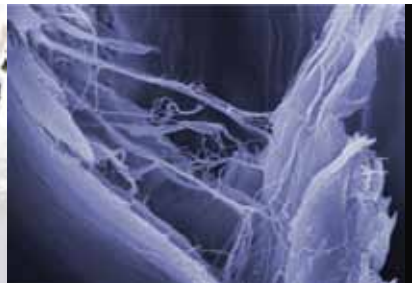
SEM image of a Gen-Os granule.
Courtesy of Dr. Ulf Nannmark, University of Göteborg.

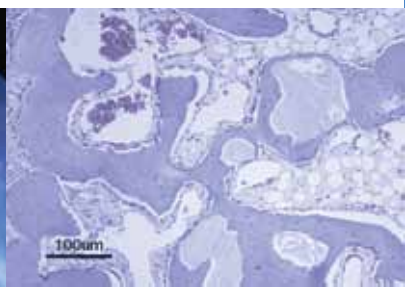
In blue all literature about OsteoBiol® *Gen-Os*

Gen-Os

A DUAL-PHASE BIOMATERIAL

Collagenated heterologous cortico-cancellous bone mix



Tecnoss s.r.l. is an innovative, globally active company that develops, produces and documents premium-quality xenogenic biomaterials by the brands Tecnoss® and OsteoBiol®.

Its 15 years of research led to its patent-protected production process that ensures neutralization of antigenic components in order to achieve biocompatibility, while preserving the natural collagen matrix inside the biomaterial.

Tecnoss® products comply with highest quality standards such as ISO13485 (notified body TÜV Rheinland), 93/42/EC (amended by 2007/47/EEC) and 03/32/EC (notified body CE 0373).

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