ImplantBook®

DENTAL IMPLANTS

AROUND IMPLANTOLOGY

IMPLANTBOOK REPORT

2021 | Global guide for Dealers and Dentists

Compendium

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ARTICLE ON P. 10

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IMPLANTBOOK 2021

ImplantBook
2021 | Global guide for Dealers and Dentists

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Check here who is looking for distributors

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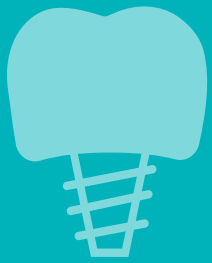

DENTAL IMPLANTS

B&B Dental

B&B Dental is an Italian implant producer that offers one of the widest ranges of implantology related products and services on the market. It provides various implant lines to meet the needs of your clinical cases. The principal implant lines are:

· The **DURA-VIT 3P implant line** is suitable for all surgical procedures and excellent in *all bone types* thanks to its characteristics which guarantee better control during implant placement with high primary stability. It can be used in sinus lift cases thanks to its rounded tip and smoothed out thread.

· The **DURA-VIT EV implant line** is apposite for surgical procedures in 'spongy' type bone since it is able to obtain *excellent primary stability* due to its aggressive thread. These implants find their use also in post extractive cases due to the large cutting thread that give an optimal primary stability for immediate loading.

· The **DURA-VIT WIDE implant line** features a larger body diameter for immediate insertion into a premolar and molar extraction sites. Its characteristics allow easy penetration, good alveolar adaptation and high primary stability. This results in optimal implant placement at the extraction site, that *minimizes bone loss* and the need for bone grafting with a consequent reduction of treatment time and the increase of patient acceptance.

· The **DURA-VIT PTERYGO implant line** is a solution designed for maxillary atrophies as *an alternative to regenerative or sinus lift procedures.*

· The **DURA-VIT SLIM implant line** has a narrow diameter specifically designed for restorations in *aesthetic areas* particularly in the incisal region and the narrow mesiodistal space. It offers a solution to treat the most difficult cases of single mandibular incisal edentulous, as well as cases of maxillary lateral agenesis with exceptional aesthetic results.

· The **DURA-VIT MINI implant line** are monobloc implants which are primarily indicated during the healing period in a treatment with conventional implants for the stabilization of temporary mobile dental prostheses using a *minimally invasive* transmucosal technique. However, it can also be used for permanent restoration of full or partial dentures with immediate loading in both dense and soft bone. It includes mini spherical head and cube-shaped head implants.

Implants are provided with two different **conical hexagonal connections** that allow the easier management of prosthetic components, both in terms of clinical choice and ordering administration. 3P, EV, Wide and Pterygo implant lines are equipped with a unique connection called CONEXA. This exemplary connection ensures the **anti-rotationality** and **high resistance** to torsional loads, thanks to the *internal hexagon.* The **conical cone Morse** connection gives far greater **stability** to both to the prosthetic components and consequently to the surrounding tissues, thus improving patients' health in time.

B&B Dental also supplies **surgical kits** with well-designed range of tools that include bone **compactors** and **reamers** that allow for easy surgical management of any clinical need. The range includes guided surgery, sinus lift, pterygoid and wide line arrangements, with clear color-coded tools for *easy and intuitive choice of instruments.*

In addition, B&B Dental provides **digital solutions** with **free implant planning software** – B&B Dental Guide System - complete with model and surgical template creation tools. The software can be downloaded from the download area of www.bebdental.it

In order to enable the clinicians reach the best aesthetic and functional results the product line is enriched with the **bone regeneration materials** which include *equine origin collagen membranes, bovine and coral bone substitutes and titanium grade II moldable meshes.*

The company also provide **implant insertion motors** and **oral hygiene products** to support all phases of implant placement and care. The Italian production, the particular attention placed in every aspect of its products together with *30 years of experience* empowers the **customer care and support**. It provides the customers with a constant presence of the *technical team* which is always ready to answer any queries. Find your new implantology partner and join the B&B Dental family.

MINI LINE

ø 2,0 - ø 2,4 - ø 2,5 mm
Monobloc implants with reduced diameter to stabilise prosthesis

WIDE LINE

ø 5,5 - 6,0 - 6,5 - 7,0 mm
A larger diameter line for post-extraction sites

PTERYGO LINE

ø 4,7 mm
The solution line for maxillary atrophy

3P LINE

ø 3,5 - ø 4,0 - ø 4,5 - ø 5,0 mm
The line that offers implant fixtures with gentle thread suitable for sites adjacent to maxillary sinus and with compact bone

SLIM LINE

ø 3,0 - ø 3,4 mm
The reduced diameter line for sites with lower bone availability

EV LINE

ø 4,0 - ø 4,5 - ø 5,0 mm
This line features implant fixtures with an aggressive thread for spongy bone, offering maximum stability

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Oxy Implant®

Oxy Implant®: this is the name of a Dental System entirely produced by the Italian Company Biomec. Since its foundation in 1990 Biomec has focused all its efforts on research, development and manufacturing of special solutions for dental replacement.

Oxy Implant® Lines are the result of an over twenty-five years experience and offer surgeons ease of use and long-term reliability.

High quality raw materials made in Germany are the first asset of all Oxy Implant® products: commercially pure Titanium Grade IV for Implants, Titanium Grade V for abutments and screws, stainless steel for surgical instruments.

Machines used by Biomec to manufacture its devices are the second one: all of the latest generation, made in Swiss or Japan, they are equipped with the best CNC technology which allows to work with extremely high precision and low tolerance. This is the key to obtain immediate stability of the implant-abutment connection, a relevant factor for the successful outcome of the treatment.
The expertise of Biomec team is the third one: engineers with a specific know-how and the ability to design the best harmonized connections between implants and prosthetic components. This makes the surgeon's and dental technician's work easier and the treatment outcome more predictable.

The continuous professional training of all staff at Biomec allows to work together towards a common goal: maximum quality of products. For the same reason the thousands of Oxy Implant® products manufactured every year are checked one by one and the precision degree of all machines, from the callipers to the lathes, is constantly verified by specialised companies. These and other Biomec features (for instance the full traceability of all devices) have allowed the Oxy Implant® Lines to get CE Certification, the medical devices of Oxy Implant® dental system comply with the directive 93/42/CEE. The manufacturer Biomec s.r.l. has obtained the authorization for sale by European notified body CE 0434 and has a certified quality system ISO 9001 and ISO 13485.
All these Oxy Implant® points of strength are enhanced by another exclusive feature: the surface treatment "AMS" that characterises all Oxy Implant® Lines and joins the best outcomes of previous experiences, from simple machining to chemical treatment. "Advanced Micro Surface" is obtained by two consecutive processes: a first sandblasting allows to gain the macro-roughness, a subsequent chemical action completed with cold plasma-Argon-super-decontamination defines the final result. A surface characterized by a high degree of cleanliness and a homogeneous micro-porosity of a few microns which boosts the osseointegration in order to get the best stability and the maximum percentage of clinical success.

Oxy Implant® lines include:
- Classic Line: cylindrical design, cylindrical platform with an internal or external hexagonal connection, polished collar with a length of 0.5 mm designed to avoid plaque accumulation and, in this way, to minimize the risk of peri-implantitis onset. The line features a single thread and two possible pitches: 0.6

mm for Micro Thread, 1.2 mm for Normo one.

- Piesse Line: cylindrical shape in the superior half, near the head with platform switching design, and conical shape in the inferior one. A double thread characterizes these implants and surgeons can choose between two pitches: Micro one of 1.2 mm and crest distance of 0.6 mm, Normo one of 2.4 mm and crest distance of 1.2 mm. Two types of connection are available: internal hexagon or external hexagon. This last version is the best one to use for All-on-4 and All-on-6 cases, with specific prosthetic components called “Immediate Load System”.

- Micro Line: mono-phase micro implants with straight abutment or ball abutment.

- Short Line: short implants (maximum length: 8mm) with head platform switching design.

- K1 Line: last born of Oxy Implant® products. It summarizes the best features of its older “colleagues”: platform switching head, polished collar, double thread (pitch 1.8 mm, crests distance 0.9 mm). The most innovative attribute is inside: a conical connection with an hexagon underneath, perfectly fitted by dedicated prosthetic components that are screwed and not simply inserted into the implant. It has been designed to allow the connection to be tightly sealed, provide excellent load distribution of abutment onto implant and minimize micro gaps.

Oxy Implant® Lines: the choice for most advanced Dental Professionals!

OXY IMPLANT®
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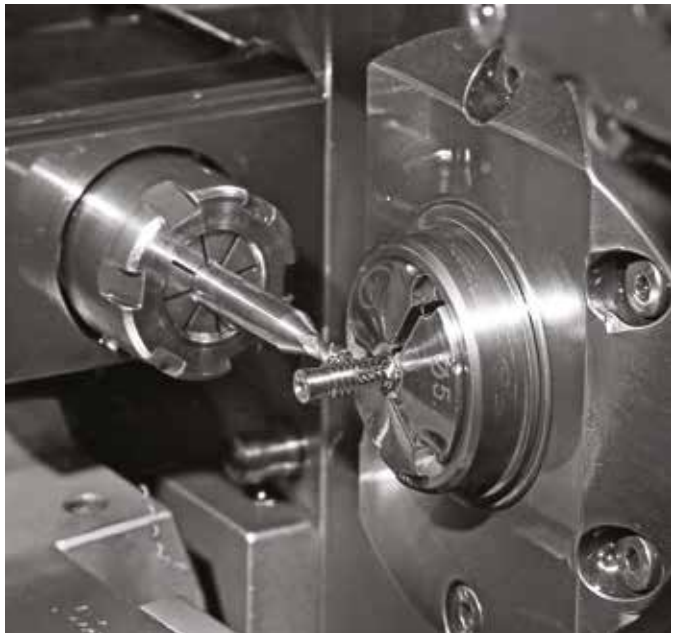

Bionnovation

Join our worldwide distributors

Bionnovation is a Brazilian company specialized in Dental Implants & Biomaterials. Our products, services and training available in over 40 countries with more than 15 years of experience and research. This year the Bionnovation are introducing a stream of new products and solutions, whose availability in some markets is subject to regulatory approvals.
SWE Implant and an innovative tent screw, called Tent Screw DM. The main advantages of tent pole technique are stable gains in vertical alveolar bone height, successful retention of implant prosthesis associated with the procedure.

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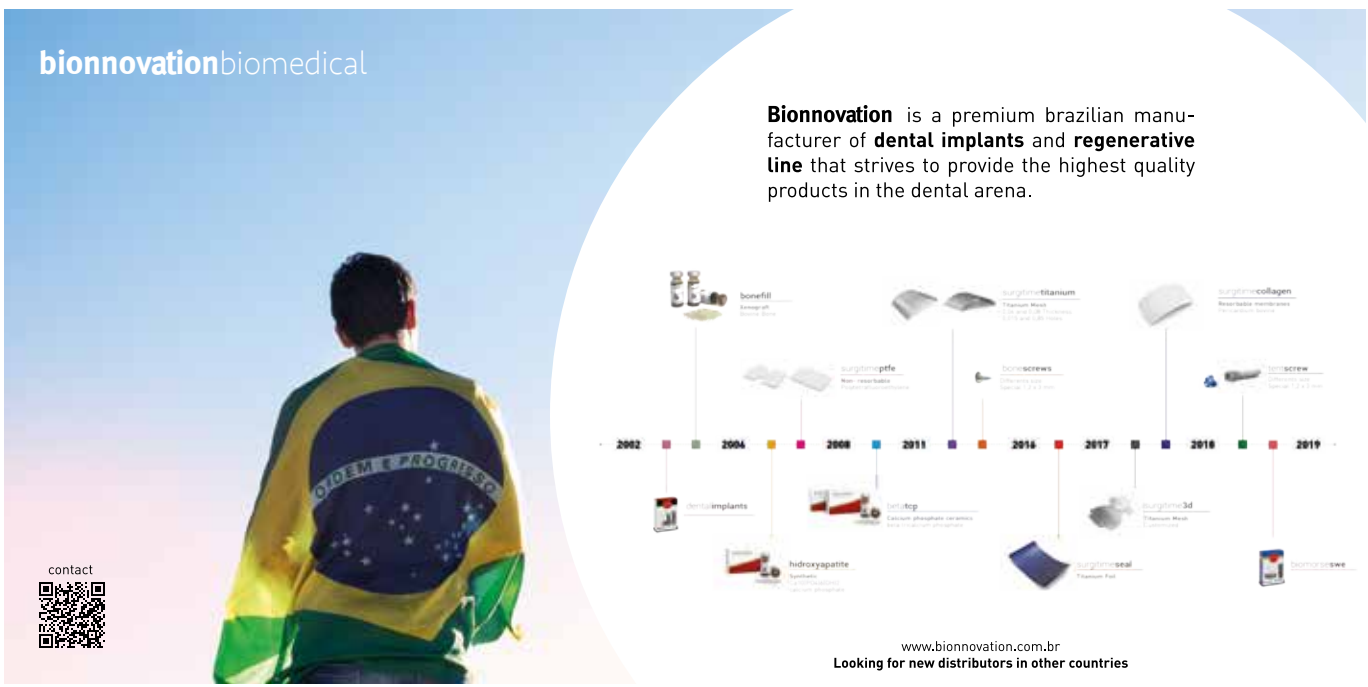

BTI Biotechnology Institute

Leader in innovation in oral implantology and regenerative medicine

BTI Biotechnology Institute is a Spanish multinational, founded in 1999 and specializes in biomedicine and biotechnology, whose activity focuses on: **Regenerative medicine and Oral implantology.**

Thanks to its commitment to **research and R&D**, BTI is today one of the companies of reference at an international level in the area of implantology and oral rehabilitation, offering a **wide range of clinical solutions in a way that the dental professionals can address their treatment with the utmost confidence and predictability.** The intensive research work of BTI is reflected in the publication of more than 200 scientific articles in the most prestigious journals with the greatest impact worldwide.

BTI range is one of the most complete in the market, covering technologies, concepts and products that can respond to all the needs of the dental practice, from surgical planning using the **BTI Scan4** software to surgery, by means of the **versatile system of implants** and, of course, the restoration through prosthetic components with a **great precision in the machining** and CAD CAM systems.

Thanks to recent advances in research, the BTI system of implants has a **surface of unique characteristics**: topography of triple roughness modified with **free calcium ions**, which enables the adhesion and activation of platelets instantaneously during the moment of implantation, inducing the regeneration process to start immediately. This implies a quicker regeneration process, with a **lower risk of peri-implantitis**, thanks to the biological seal against the bacterial attacks provided by this surface. It should be noted that the range of BTI implants was **the first to receive the seal of the CleanImplant Foundation**, which certifies the quality of the materials and the purity of the implant surface.

For the treatment of transverse and vertical bone defects, BTI introduces simplified protocols with the use of implant of reduced diameter and length, as well as an **autologous regeneration technology : Endoret® - PRGF®**, to resolve the limitations that may have re-absorbed bones.

Endoret® - PRGF® technology is the most advanced autologous system in Platelet Rich Plasma, whereby, from a minimum volume of blood from the patient, it is possible to isolate and concentrate the growth factors and other proteins responsible for the repair and regeneration of tissues for therapeutic use. Thus, the application of Endoret® - PRGF® allows to stimulate, accelerate and improve the repair process of damaged tissues in an injury.

http://bti-biotechnologyinstitute.com
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BTLOCK: The Made in Italy of Oral Implantology

Technology. Research. Italian production.
BTLock is the Made in Italy of oral implantology: a quality trademark fixed on every smile.

The element that from the beginning identifies the implantology signed BTLock is the invention and the development of a new concept of implant connection: triangular, twice anti-rotational, internal and asymmetric on three different levels. The international patent makes it unique. BTLock System has four major points of strength, which allowed to solve two problems: the tightening of the connection and the duration of the prosthetic work.

- The design, with triangular shape with rounded corners, which gives precision and stability.
- The depth of the connection (2,96mm), that improves tightening and optimize the distribution of chewing forces, so the micro-movements are reduced to the minimum for a high mechanical stability.
- The conical bevel on the fixture with counter-shape on the Abutment, that allows a perfect matching between fixture and abutment, without exceeding profiles or gaps. This high precision avoids any fluid infiltration and keeps the peri-implant sulcus free of inflammation.
- The processing technique, milled with the lathe, that unlike the matrix technique is more precise and does not create stress that could be damaging.

For these reasons, the BTLock implant connection system is original, innovative and effective, so as to become our image, our brand, our logo. BTLock offers a wide range of products that satisfy many applications.

There are four categories of BTLock implants:

- Two-stage implants, featured by the original patented BTLock connection
- Mini Implants, suitable for the long term stabilization of removable prosthesis
- Mini Single Implants, of immediate functionality, suggested for the narrow areas of the dental arch
- Slot Implant, the application for orthodontics

The prosthetic components and accessories range is complete, user friendly and it responds to a wide variety of problems, A special mention goes to Expanders and Osteotomes, to be used to create and compact the implant sites without bone loss, and to the kit for Guided Surgery, which allows to use a technique that combines calibrated drills and expanders. The quality assurance is one of the essential elements during the study and development of our products, which are made entirely in Italy. Furthermore, the request for international distribution has brought BTLock to conform its production also to extra-UE standards in order to obtain the registration in foreign markets such as the USA (FDA), Taiwan (DOH), Brazil (Anvisa), South Korea (KFDA) and Mexico (Cofepris). Since 1996 BTLock projects and develops its products willing to improve, day by day, the practice of professionals and the smile of their patients.

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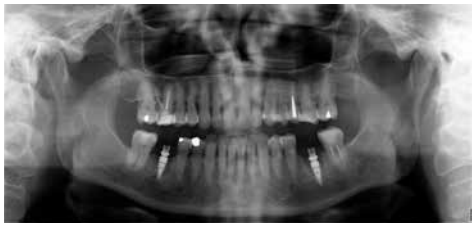
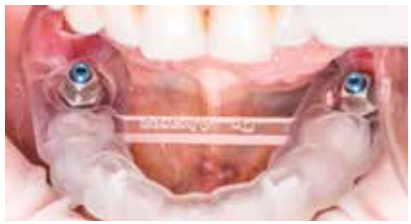
Cortex Smart Guided Surgery System

Dr. Orlando Alvarez





Today to navigate on the road you use GPS systems, why not in dentistry?
Here there is a septum case that was solved via combination of virtual implant planning software - Implant Studio (3Shape), with Cortex Guided Surgery Kit System that provides the ability to perform the right implant installation, and Magix Implant by Cortex - a proper implant design that could act as a bone expander using a minimum bone drilling.
The case was planned remote to the treatment place in the Digital Lab at Cortex HQ. After one week the surgical template was received in Chile, where the procedure was performed.

Following the clinical and radiographic examination, a virtual diagnostic impression was taken plus a CBCT scan. The digital data files were imported into computer-guided planning software and perfectly merged.
Cortex Magix implant for the mandibular first molar was virtually planned for placement in the septum site. The ideal position of the implant was virtually planned based on the anatomical architecture and prosthetic considerations. The angulation and vertical position of the implant were determined to minimize axis loading of the implant and create a proper emergence profile.

A 3D printed surgical template from a rapid prototyping machine (Stratasys) was designed and fabricated for the surgery. The drilling osteotomy and Implant installation process were smooth and precise, and the results run as they were planned.
Advances 3D imaging technology, including CT scans combined with CAD/CAM technologies have revolutionized the field of implant dentistry.

The use of computer-guided implant surgery was developed to allow a visualized, precise and prosthetically driven virtual planning. It allows to improve the accuracy of surgical implant placement and final prosthetic outcomes.

There are clear advantages to the clinician as well as to the patient. Some of them are reducing the time of the procedure and the healing process. The implant installation is more secure, like when planned to be installed in a fresh socket site or an incomplete bone healing of a lower or upper first molar.

In conclusion, the procedure based on a virtual simulation allows you a complete analysis of 3D implant position in relation to vital maxillofacial structures such as nerves, sinus, adjacent teeth and of course the limits of bone (quantity & quality). More importantly, it provides a link between the virtual prosthetically driven treatment plan and the actual surgery by transferring the simulated intervention accurately to the surgical site via a surgical template made exclusively to your case and selected implant.

Contact Cortex Dental Implants Industries Ltd. to know more about Cortex innovative Digital Solutions.

www.cortex-dental.com
info@cortex-dental.com

Compatible implant lines produced by Dental Planet

Dental Planet, the leading Italian company in oral implantology, has a certified quality system ISO 9001 and ISO 13485 with TUV SUD.
Specializing in the design and production of dental implants compatible with the major implant platforms on the market.
The experience gained over the years has allowed us to develop implant prosthetic technologies of high quality and innovative materials at affordable prices.
The ACTIVE implant, new 2018, available in two different diameters and four lengths, has the advantage of having a single prosthetic component for both diameters.

ACTIVE is added to the five types of implants already produced by Dental Planet:

ONE cylindrical system with external connection
S.INN conical system with internal connection
EVOC conical system with trilobate connection
KO.INN cylindrical system with internal connection
TWO cylindrical system with internal connection

All of our implants are equipped with a titanium mounter device that can be used as a transfer or a final abutment. Dental Planet implants can all be used with a single ratchet.
The packaging is made up of a box indentified of one label, implant name and color code.

Inside the box there is an aluminum envelope containing the dental implant with mounter and cap screw, all enclosed in a double ampoulethe, an instruction sheet and two patient labels to apply to the implant passport.

Dental Planet is also specialized in the production of prosthetic accessories for about 15 implant platforms.

Example:
Healing screws
Transfer
Laboratory analogues
Straight and angled abutments
Temporary abutments
Abutments for bonding
Uni Abutment straight and angled
Castable abutment
Castable with Chrome/Cobalt base

www.dental-planet.it
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DentalTech®

DENTAL IMPLANT SYSTEM

MADE IN ITALY

DENTAL TECH IMPLANT LINE

Safe, versatile and for all clinical needs

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info@dental-tech.it

www.dentaltechitalia.com

Transmucosal Abutment

Shape Tissue Effect

Dental Tech has expanded its wide range of products with a new prosthetic component that promotes the conditioning of peri-implant tissues. It is applied at the same time as the surgical phase of implant placement, maintaining freedom of flexibility during the prosthetic phases. The transmucosal abutment radically simplifies the prosthetic procedure, since it moves the engagement platform of the external connection implants from the bone level to the soft tissue level. Moreover it simplifies the impression taking since the connection is clearly visible.
It is prosthesisable both in immediate loading, in a variety of secondary components suitable for the planned prosthetic project, and in deferred loading, preserved by a protective cap that leaves the soft tissue undisturbed to optimize healing and complete Implant integration. The abutment's external connection platform offers a wide range of prosthetic solutions to better manage the prosthetic needs of each project. Once positioned according to the prosthetic emergency, it is no longer removed, guaranteeing the stability of the surrounding peri-implant tissues. Acting on the transmucosal abutment with a Torque of 30Ncm, perfect matching between the abutment-implant interface is ensured, thus preventing the migration and bacterial colonization on the "**pumping effect**" action.
The abutment is available for FTP, ImpLogic® and ImpLassic implant connections, in different types of transmucosal height.

www.dentaltechitalia.com // info@dental-tech.it
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Surgical Tray

Tray M - For ImpLogic® AT, ImpLassic FT3 and ImpLassic FTP

Dental Tech surgical trays, with their ergonomic design, provide the best ratio between the surgical instrument contained and the size of the box. They are light, manageable, stackable, compact and spacious.
They are also easily transportable and guarantee the safety of their contents, avoiding the loss of the same during handling. The plastic materials used are highly impact resistant and certified for more than 1000 autoclave sterilization cycles.
Tray M Surgical Kit, allows the clinician to work with a single kit of surgical instruments, regardless of the implant line used (ImpLogic® AT, ImpLassic FT3 and ImpLassic FTP).
For easy identification of each instrument and subsequent repositioning after the cleansing and cleaning phase, the professional can count on help of a color-coded system that traces the most suitable surgical procedures for the various implant diameters. All the drills included have practical depth stops that can be easily inserted and removed from the drills in the tip > shank direction. To complete the kit, the screwdrivers and the torque wrench are included. The latter is a high precision tool, easy to use, that provides the professional a tool of tightening and loosening screws, prosthetic elements and implants.

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Dentatus ANEW®
Narrow diameter implant system
One implant more options

LONG-TERM RESTORATIONS
Many dentists choose to use Dentatus ANEW® Implants as a long-term solution providing gold standard treatment options for more patients who would otherwise forego implant treatment.
In areas of limited bone width, mesial-distal space or converging roots, Dentatus ANEW® is an ideal solution. With a tapered apical end, Dentatus ANEW® implants can be placed in interdental spaces as thin as 3.5 mm without the need for bone augmentation or orthodontic interventions.

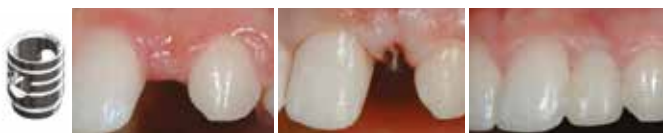
Since their FDA Clearance in 2004 they have been used routinely for single tooth replacement in areas of congenitally missing laterals and lower centrals. Dentatus ANEW® is the only narrow-body implant with a screw-retained prosthetic system and over 14 years of clinical and university based research supporting safe and reliable, long-term use.

INTERIM SOLUTIONS
With the minimally invasive 1.8 mm diameter, Dentatus ANEW® can be used as an interim device for stabilizing patients during full arch restorations, bone augmentation and sinus lift procedures.

DENTURE RETENTION
With the Elypse Platform ANEW can also be used for removable prostheses with the proven ATLAS® Denture ComfortTM technology.

THE OPPORTUNITY
Dentatus ANEW's narrow diameter system is designed to complement your current implant system. With low start-up costs, Dentatus ANEW® offers the most prosthetic versatility, while taking into account the generally accepted principles of implantology.
One Implant... More Options

SINGLE TOOTH PROSTHETICS



Courtesy Dr. Paul Petrungaro, 2004

MULTI-UNIT RESTORATIONS

Photos courtesy Dr. Ziv Mazor

ELYPSE® FOR REMOVABLE DENTURE

Photos courtesy Dr. Mark Iacobelli

Dentatus ANEW® is available in 1.8, 2.2, 2.4 and 2.8 mm diameters.

www.dentatus.com // info@dentatus.se

Futura
Manufacturers of dental implants

FUTURA was founded by Dr. Giovanni Carlo Ferretti in 1987. Following its founder footprint, FUTURA today designs and produces functional and easy to use implant systems.

High quality raw materials are the first asset of FUTURA implant systems: implants made in Titanium gr.4 ASTM F67 for mechanical resistant and biocompatibility. The surface treatments performed on “Devices” are carried out with processes controlled by current legislation UNI CEI EN ISO 13485-2012, in order to guarantee all the characteristics of the titanium.
The prosthetic components and screws are made in Titanium gr. 5 ASTM F136 used for high mechanical strength, stainless steel for surgical instruments.
Design and production taken on site with validated and controlled processes, up to white room packaging, sterilization of the products is carried out by gamma irradiation from a highly qualified company.
The collaboration with qualified laboratories operating under European standards guarantees full control of FUTURA products.
The continuous professional training of all the FUTURA staff allows to work together towards a common goal:
- Maximum quality of products and assistance for clients,
- The achievement of functional dental implants and products that are actually needed by the modern dentists who need simple and successful systems.

FUTURA today offers 7 implant lines all with a single surgical kit:
- 2 lines internal hexagon: PRI and KRI implants
- 3 lines external hexagon: PRE, BRK and BR implants
- 2 lines one stage implants: VIP and VD implants

PRI implant is good for any clinical case.
The conical apical section and the cylindrical body allow an optimal primary redemption in the several bone density, both in upper and lower jaw.

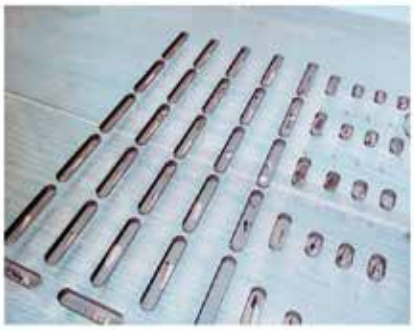
KRI implant main feature is a large and very cutting thread which gets immediately an high primary stability.
This implant is ideal for post-extraction and immediate loading.

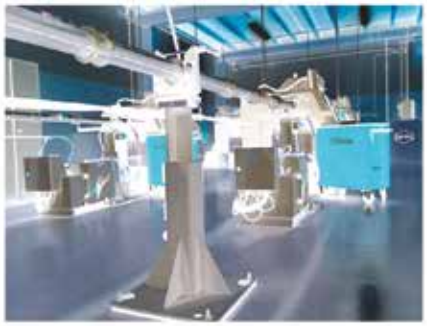
PRE implant is good for any clinical case.
The conical apical section and the cylindrical body allow an optimal primary redemption in the several bone density, either in upper either lower jaw.

BRK implant is the evolution of BR implant with 1 mm thread and rounded apex. Ideal for improving the primary stability for D3-D4 bone density, mostly in upper jaw.
BR cylindrical implant. Thread 0,6 mm, ideal for lower jaw, mostly for D1-D2 bone density.

VIP Implant is ideal for immediate load.
VD mini-Overdenture implant.

FUTURA offers to dentists a range of implants that can meet all operational needs, while rationalizing surgical instrumentation and prosthetic components of implants.





FUTURA STAFF IS GLAD TO INVITE YOU TO VISIT OUR COMPANY, TO GIVE YOU AN IDEA OF OUR MANUFACTURING PROCESSES AND TO ESTABLISH A COMPREHENSIVE TRANSPARENCY COLLABORATION AND RELATIONSHIP TO GIVE YOUR PATIENTS A FABULOUS SMILE.

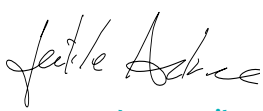
www.futuraimplantsystem.it
futura@lobooral.com

Geass and iRES give life to IESS Group

"It is with great pride and trusting in a bright future that we would like to tell you about an important development in the corporate growth of the companies GEASS and iRES GROUP": these were the sentiments voiced by Mr. Alessandro Ribolla and Mr. Andrea Gentile at the company meeting to present this new and exhilarating project. The fusion of the two companies will breathe life into IESS GROUP Dental Intelligence.
The union of two solid businesses will mean, in the immediate future, an enhancement of both companies' positives and a consolidation of operational synergies. Despite being competitors, the two companies have proved to be extremely well aligned.
First and foremost, iRES will bring its high quality Swiss production to the table, as well as its market recognised hybrid implant, its scientific activity (which sees the participation of some of the most well-known international Opinion Leaders among whom we can name Prof. Massimo Simion and Prof. Giulio Rasperini), its particularly international character and not least its 'story' which has seen the company grow rapidly to the highest of levels. GEASS will add to the mix its 'Made in Italy' designs, its excellence in the digital and CAD-CAM fields, its patented technology (like its SYNTHEGRA laser surface) and most importantly a solid structural base where dedication to organisation and work criteria have always been fundamental aspects in over thirty years of experience in the sector.
IESS GROUP will increase its network presence both in Italy and internationally thanks to a solid group of over 60 representatives on the Italian peninsula and 25 international distributors. It will create a new and richer product portfolio, maintaining elevated quality standards and sustainable prices. This makes it possible to progress with a more forceful commercial policy, allowing both the brands and the group to grow.
IESS GROUP will focus its attention on new investments and will be a catalyst for those of you who wish to join the project created by these two entrepreneurs. Particular attention will be paid to companies in related sectors and to the acquisition of national and international enterprises.
This venture can be defined as "unique", in that it sees two smaller companies as the protagonists. It is exactly this "condition" that allows the companies to gain an immediate advantage.
GEASS e iRES share the same market vision, a market which no longer makes rapid and preeminent growth possible, like in the past.
This new group is based on its team, with the certainty that this effective team is a great one, united, motivated and determined to achieve the same goal: to be protagonists in the future of oral surgery.

This is just the beginning; you'll be hearing more from IESS Group!

Dott. Alessandro Ribolla
President



Dott. Andrea Gentile
General Director & V.P.

IESS GROUP srl
+39 0432 669191
www.iess.dental // info@iess.dental

iRES complete solutions for oral surgery

IESS GROUP DENTAL INTELLIGENCE

geass

iRES

Swiss implant quality

geass

Our implant line
reliable,
efficient, safe

Way
the way towards
excellence

IDS 2021
22.-25.09.2021

Hall 2.2
Booth C060

Infodent & Infomedix International

ADVices

Creative without strategy is called 'art'. Creative with strategy is called 'advertising'.

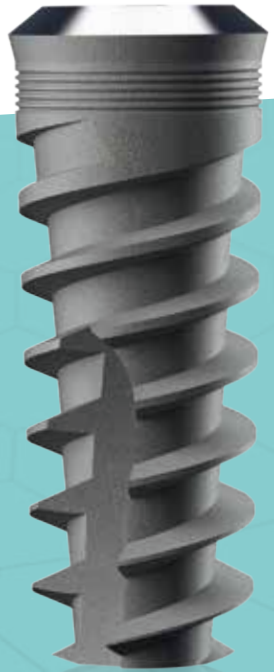
Jef I. Richards

Infodent
Infomedix
International
Publishing
& Consulting
House

100% made in italy

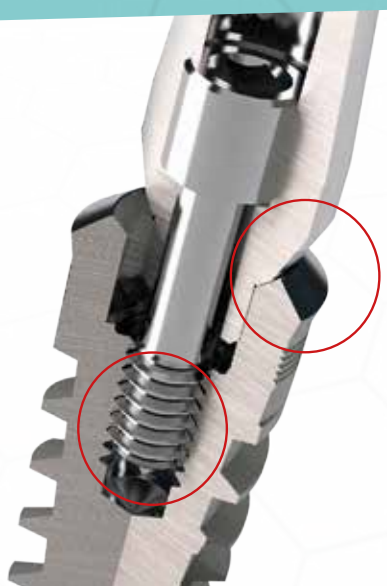
meté
Biomedical

TAG 3.0



TAG

TAG
straight



TAG LINE

the right solution for every single case

- Internal hexagon connection
- Platform switching
- Single platform for all diameters

www.dentalmete.it

MaCo Dental Care

MaCo Dental Care just concluded its twenty-fifth year of presence on the dental market and, once again, it confirmed how every goal can be achieved by pursuing a winning idea and building a reliable and versatile profile.
This Italian company was established as a result of the will of a group of young dental professionals eager to put to good use their experience and to create their own brand. The company has thus started the production of implants, within its plant in the industrial complex of Buccino, just 100km south of Naples.
In the initial phase, the dental implants design focused on standardized and widely used connections, developing an external hexagon implant, Omnia, two internal hexagonal connection, Introskip and Seventeen, the Easy mini implant, a Three Lobes connection and the Octoplus octagonal connection.
In recent years, however, MaCo has defintely changed gear by introducing switch platform system on the already well-known Seventeen implant, which has evolved into Seventeen-One, and introducing on the market Conical Active, a well received conical connection implant.To date, MaCo offers eight different connections guaranteeing specialists a wide choice able to satisfy every kind of specific need related to the single case to be addressed. The quality control system is based on maximum efficiency and safety, certified to comply with the standards established by ISO 13485. Produced devices are issued with CE marking. The company growth isn't limited to manufacturing and, perhaps, its market development is even more remarkable. MaCo Dental Care implants, in fact, have established an increasingly relevant presence on the market and their diffusion abroad is the result of a winning choice: to guarantee very high quality standards, while remaining in an accessible price range. In many countries, MaCo Dental Care started to promote its products through participation in international events and trade fairs, gathering increasing acclaim and, in some cases, the company has further strengthened its position opening subsidiary branches of the parent company. MaCo Dental Care Mexico was the first example of this type and is, for many years, a well-known reality of Mexican implantology. Following the Mexican experience, MaCo Dental Care has operated in a similar way in other countries and currently distributes its products in Europe, Northern Africa, Middle East and Latin America. In addition to the commercial distribution, MaCo Dental Care carries out a continuous training activity in the countries where it distributes its products, through courses, seminars and workshops held by Italian and international specialists.

MaCo Dental Care has recently marked a significant turning point in its market approach, investing significantly in the digital sector: an increasing number of professionals, in fact, rely on the use of advanced tools and applications for their daily work. The aim of the company is to offer its customers, alongside reliable and innovative implant systems, core business for which it is already known and appreciated, all the tools required to advanced dentistry to operate and keep up with the times: desk scanners, intraoral scanners, micromotors, biomaterials and, specially, its own guided surgery system that allows to manage all the digital flow and to operate with a dedicated surgical instrumentation. MaCo Dental Care is always looking for new energies and new distributors willing to accept this completely "Made in Italy" challenge.

IM Macon

MaCo also implemented its implant catalog in search of solutions that better meet the needs of the clinical community. This philosophy led the company to IM Macon, a short type fixture conceived by dr. Ennio Calabria.
It is a short implant designed to guarantee minimum invasiveness, creating the least biological trauma and exploiting even the smallest resources that oral tissues make available to us, avoiding, as far as possible, the need for patients to undergo more complex and exhausting surgeries.
This implant offers many peculiar characteristics, some of which represent absolute innovations, specifically patented:

- IM Macon is designed to reduce or eliminate the risk of peri-implantitis thanks to the large emergence of the abutment base which gives a biological width as close as possible to the natural tooth
- The design with inclined platforms increases the implant-bone contact surface.
- The absolute novelty is represented by the double anti-rotation system, present both in the lower and upper part.
- IM Macon guarantees high prosthetic stability without the use of a tightening screw.

www.macodentalcare.com // info@macodentalcare.com

MaCo
DENTAL CARE
welcome to a brand new world

Im Macon

- Short implant with tapered connection
- High prostethic stability without fixing screw
- Sloped platrform design with wide bone-implant surface

Diameters
Ø 3.10mm
Ø 3,60mm
Ø 4,10mm
Ø 4,60mm
Ø 5,10mm

Conical Active

- Conical connection with internal antirotational hexagon
- Switch platform system
- Anti percolation tapered connection

Diameters
Ø 3.50mm
Ø 3,90mm
Ø 4,40mm
Ø 5,50mm

Seventeen-One

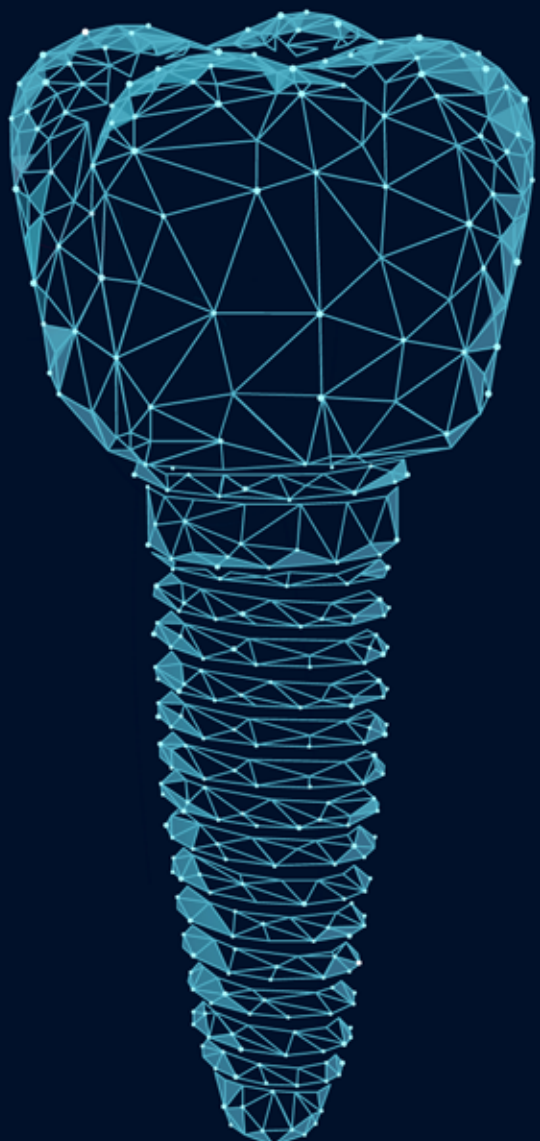
- Internal hexagonal connection
- Switch platform system.
- Coronal microthread

Diameters
Ø 3.30mm
Ø 3,75mm
Ø 4,20mm
Ø 5,00mm
Ø 6,60mm

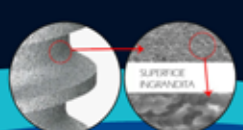
Easy

- Mini implant designed for stabilization of total prostheses
- Sphere of 1,8mm
- Simplified and minimally invasive surgical protocol

Diameters
Ø 2,3mm
SUPERIOR
Ø 2,00mm
INFERIOR



Intraoral scanners - Desk Scanners
3D software - Guided surgery system
Micromotors Biomaterials - Osteosynthesis



MaCo Surface All impants are sad blasted and acid atched to improve their biomechanical characteristics. This treatment generates microcavities, comparable in size to those of the osteocytes, that facilitate the osseointegration.

Reliability and durability
MaCo Dental Care implants have a success rate among the highest in the sector.

Wide prosthetic choice
All implant lines provide the specialist with all prosthetic components and instruments needed to better manage the specificities of each case

Made in Italy

www.macodentalcare.com - info@macodentalcare.com

MaCo 3D & MaCoGuide

MaCo 3D
MaCo 3D is a software that allows you to perform three-dimensional implant simulation directly on your personal computer. It simulates the position of the implants on two-dimensional and three-dimensional models, indentifies the mandibular canal, traces panoramics and sections of the bone model and visualizes the three-dimensional bone model with the ability to calculate bone sensity. Using MaCo 3D, the dentist can plan implant-prosthetic surgery more safely, efficiently and quickly.

MaCoGuide
MaCoGuide is a module of the MaCo 3D software that allows the design of guides for performing implant-prosthetic intervention in guided surgery.
MaCoGuide allows you to create mucosa supported, teeth supported, bone supported and double-scan CT surgical guide.
With a few clicks of the mouse you can create an extremely precise and customized surgical guide and the type of bushes to use, MaCoGuide generates the STL file ready to be printed with a 3D printer.
Advanced features allow you to add text to the surgical template, create inspection holes, and add text to better identify the printed template. MaCoGuide allows you to export the model for suitably perforated analogues based on the used implant system and the size of the analogues.

www.macodentalcare.com // info@macodentalcare.com

MaCo GUIDE

GUIDED
SURGERY
SOLUTIONS

GUIDE

www.macodentalcare.com
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NOVAMIND
Let's make implant works

Novamind offers the entire spectrum of possibilities in implant dentistry, fulfilling any demand in implant treatment. The most widely used implant shapes and connections worldwide, full compatibility. Novamind has created 5 implant systems of high precision, yet really economic. The state of the art CNC machines ensure a perfect milling quality in an absolutely secure production environment (ISO certified) and a perfect under two microns fit between implant and abutment. Besides, the use of the highest standard raw materials such as Titanium grade 4 for implants and titanium grade 5 for prosthetics makes Novamind implants an absolutely safe choice. The surface treatment is an extremely elaborate process. SLA type treatment as well as a latest technology cleaning process with PLASMA REACTOR give to Novamind implants a perfect and fast osseoinegration. Surgical instruments are offered for all systems.

Each clinician can find his own preference among the five Novamind implant systems

- **PROTON:** hex plus tube in tube connection, very good primary stability, small diameter 3,4 implants
- **SYMMETRON:** the well-known octagon plus Morse taper connection, excellent preservation of biological width
- **KRATEON:** the trilobe connection with the special tapered shape
- **ARTION:** universal hex connection, perfect primary stability, one prosthetic platform for all diameters
- **ANTIROPON:** the latest development in Implantology, hex combined to conical connection, platform switching, aggressive shape ideal for cases in which, immediate loading is required.

Also the Novamind prosthetics are highly aesthetic and of the highest quality. Novamind covers all the needs of the modern implant restorations. Cemented restorations, as well as screw retained of all type can be applied with Novamind prosthetic solutions. For cemented restorations Novamind offers titanium abutments with the following features

- concave form of the transgingival part is proved to have better adaptability to soft tissue
- up to 23 degrees angulation
- increased height and thickness of the abutments
- tailor made abutments according to individual demands such as emergence profile and angulation up to 45 degrees (custom abutments milling center services)
- free library interface abutments for zirconium abutments

For screw retained crowns and bridges, the following solutions are offered

- Multi Unit type abutments, straight or 17 and 30 degrees angled, for almost all famous implant connections offer versatility in screw retained restorations.
- Universal multi unit prosthetic platform, no matter the implant type underneath.
- Interface on multi unit, compatible with all the open libraries.
- Cast on abutments Co-Cr base.
- Co-Cr i-bridges and burs directly to implant. Based on STL open files. (custom abutments milling center services)
- Additive manufacturing laser sintering Co-Cr direct to implant (custom abutments milling center services)

www.novamind.gr
info@novamind.gr

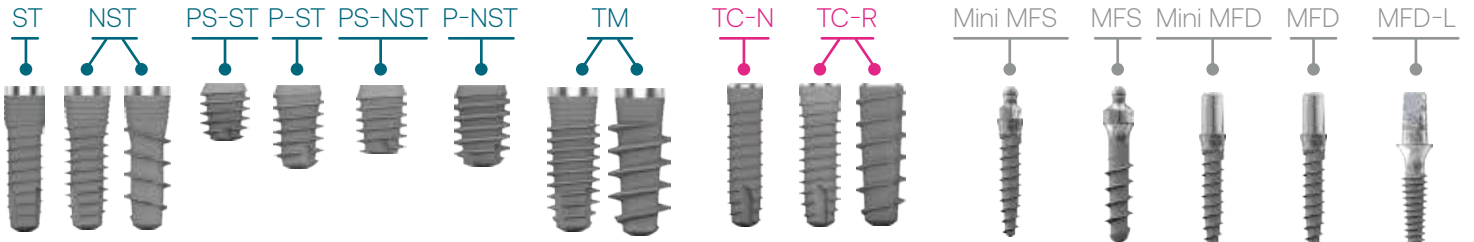
MULTYSYSTEM WORLD

Multysystem is a company specialized in the production dental implant since 1992. The long company tradition carries on the high quality made in Italy and opens the door to digital innovation for some years now.
The corporate philosophy has led to the creation of Multysystem World, a universe of products and services pursues to the customer satisfaction in dental practice.
MULTYSYSTEM WORLD is:

IMPLANTOLOGY

MULTYSYSTEM® IMPLANTS TYPES

A wide range of biphasic and monophasic dental implants with a panorama of prosthetic solutions, in order to successfully face all the clinical needs of the patient.



CLASSIC CONNECTION CC

TAPERED CONNECTION TC

MONOPHASIC MFS • MFD

MDS MULTYSYSTEM DIGITAL SOLUTION

Let's Go To Digital - Multysystem Full Digital Workflow provides different solutions:
from anamnesi to surgery, from model scanning to prosthesis with Multysystem 3D guided surgery software, hardware, training tutoring and partial coaching by our experts.

MULTYSYSTEM 3D SOFTWARE

MULTYSYSTEM GUIDED SURGERY SET

WIDE RANGE OF ABUTMENTS

(SAMPLE)

ADVANCED REGENERATIVE SURGERY & BIOMATERIALS

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Did you know?

The pricing structure of Ritter Implants prosthetic parts allows you to restore any single position for less than **$200** including: Implant, Healing Cap, Impression Coping, Analog and **Final Abutment.**
Feel free to order our entire range of Prosthetics under:

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Ritter Implants
Made in GERMANY

I see no reason to look any further!

RITTER™ IMPLANTS

"After placing and restoring a variety of implant types over the years I have decided on Ritter for its streamlined surgical kit design, superior primary stability, predictable crestal bone preservation, and diverse prosthetic options. **I see no reason to look any further! "**

Dr. Brad Fulkerson, Amesbury MA
Peak Dental Implant Solutions, Owner

FREE KIT eligible!

Ritter Implants, 4310 West Avenue, San Antonio Texas 78213
Manufacturer: Ritter Implants GmbH & Co. KG · Freiburger Str. 45 · 88400 Biberach · Germany

Root Open implant system

Created for dentists by dentists

The ROOTT Implant System was developed and is being constantly upgraded by TRATE AG in close cooperation with members of Open Dental Community.

The ROOTTCONCEPT has dispensed with the overcomplicated treatment procedures recommended by implant manufacturers who are limited by their products on the market.
The ROOTT philosophy is to create the ideal artificial tooth which organically integrates with existing biological structures in the simplest way.

The system development aims at reflecting the collective view of independent dental experts throughout the world, thus TRATE AG closely cooperates with the Open Dental Community NPO (Luxembourg). This approach helps to avoid reliance on individual opinions and makes dentists free to select the method most suitable for the patient.

Back in the old days original implants' design had a form of a straight parallel wall. But since then science has greatly moved on with the modern designs being tapered. The tapered design (also known as "V-shape design", "tapered shape design") imitates the root of a real tooth. This kind of design allows more placement options and more room available for finding the best position for it, especially in cases when the implant placement should perform in a limited space. And it makes always more sense to go with the patterns of nature rather than with an artificial straight wall design that is contrary to nature.

Besides that, the V-shape design allows to preserve more bone. When inserting a tapered implant less bone gets displaced than with a straight wall design. The diagonal V-shape design has proven to provide a greater primary stability than just a straight body design.
Root open implant system has 3 implant family designs - **ROOTFORM** (two-piece implants), **COMPRESSIVE** and **BASAL** (one-piece implants).

The core is the two-piece implant ROOTFORM - it has an aggressive implant body design with a deep tapered conical connection and an indexing hex. Besides that, wide variety of prosthetic options make it a very versatile system. Rootform implants are suitable for single and multiple restorations with delayed and immediate loading in the upper and lower jaws in all types of bone tissue. Implant can be placed by flap or flapless approach. Implant placement is also possible immediately following tooth extraction, in case sufficient bone tissue is available vertically and horizontally.

Sizes. A wide variety of diameters from 3.0 to 5.5 mm and large selection of lengths from 6 to 16 mm allows always to find the right size of implant for a patient. Special design of ROOTT conical connection allows to create a special size of an implant with minimum diameter of just 3 mm, which makes possible to replace lower incisors easily and in some cases due to a great torque load even immediately.

The same platform for all diameters. For all diameters of ROOTFORM implants one platform was developed. No matter which diameter of implant will be used, there will be no need to care if it is correct platform or not. It helps to eliminate the stock and to simplify practice.

Conical connection. Flat-on-flat connections were proven to create a micro-gap between the abutment and the implant while chewing. This constant opening & closing begins to act as a pump that sucks in all kinds of bacteria, which can lead to peri-implantitis and implant prolapse. That's why TRATE developed ROOTFORM implants with conical connection. This connection is so tight that there is no micro-gap visible even under an electronic microscope.

Multi-functional part gratis. Each ROOTFORM implant comes together with a free multi-functional part (CRE) which is made of the same material as implants and abutments. Many of dentists use CRE as temporary or permanent straight abutment. It's possible to reduce the costs up to 30% simply by using CRE part as abutment.

· **COMPRESSIVE** - the compression screw implant is ideal for simplified immediate loading protocols in healed edentulous ridges. It is used for multiple unit restorations with immediate loading in the upper and lower jaws with adequate bone tissue. It can be used in combination with basal implants and allows flap and flapless placement. Abutment direction can be adjusted using a special instrument up to 15° relative to the implant axis. It can be used with caution to create single restorations in situations where high primary stability is achieved on placement. There is wide variety of diameters from 3.0 to 5.5 mm and large selection of lengths from 6 to 20 mm.

· **BASAL** - the axial bicortical screw design is used to treat the more challenging cases with simplicity and efficiency. They can be placed in extraction sockets and in healed bone as well. The structural characteristics allow placement in bone that is deficient in height and width. They can be placed with flap or flapless technique. They can be used to bypass the mandibular nerve, and for engagement of the cortical bone at the fusion of the pterygoid with the maxilla. They also can be used in combination with Compressive implants. There is wide variety of diameters from 3.5 to 5.5 mm and large selection of lengths from 6 to 26 mm.

Both types of one-piece implant have all varieties of prosthetic components - closed tray transfer, implant analogues, burn out copings, angulation correction burnouts and shoulder burn out. The abutment is also compatible for intra oral welding protocol.

Bendable neck. The implant has bendable neck design that has a specific diameter and length that gives the implant neck the unique ability to be bent so, as to correct the abutment angulation when needed.

Simplicity. The compressive implants provide a very simple protocol for surgery and prosthesis, that works especially well for patients who would not like to go for conventional implant surgery.

Open implant system Rootт is constantly developing system, which aims to solve different and the most challenging tasks in the field of implant dentistry.

For example, Rootform implants as well as Compressive and Basal implants have innovative prosthetic option – telescopic fixation, which doesn't need ***screw or cement***. Conometric fixation provides a way to retain prosthesis, additional abutment modifications, without the need of cement or screw. Conometric fixation works on the principle of frictional contact and elastic deformation of the connecting coping. The abutment profile of all one-piece implants allows usage of an external connection system – conometric. In case of two-piece implants you just need to use the special type of abutment which is suitable for conometric caps. These and other numerous factors ensure the best biologic and prosthetic outcome. Conometric prosthetic solution with patented lifting technology for multiple unit restorations allows fixation of crown without screws or cement, that is easy but strong.

Another one example of useful innovations is unique bone builder screw for two-piece implants. Special design of the screws GF0 and GFN0 allows to grow bone on the top of the implant platform. As a space maintainer Screw Bone Builder reserves the spatium and keeps the soft tissue far from the implant platform, stopping the soft tissue migration process and giving to the bone a chance to migrate and fill in the empty space. Reserved spatium between 2 platforms (implant and screw) is about 1 mm.

This space will be filled with the blood and then a clot or a fibrin clot will fill this hollow. The bone cells will use this fibrin clot to migrate through this space and build a new bone. Screw Bone Builder allows to get complete coverage of the implant platform by bone, which means extended periosteum. Increase of the bone surface will enhance the vascularization of the periosteum and will allow more collagen attachment on the top of the implant.

Recent product innovation of Rootт are the angulated multi-unit abutments for two-piece implants, which were developed to provide the dentists with a wider range of comfortable solutions and prosthetic options. They are similar to the current regular multi-unit abutments, but now there is a choice of three different angles (15°, 30°, 60°) for each of four sizes.

Angulated multi-unit abutments allow to insert Rootform type implants at a wider range of angles, for example, when the angle between two Rootform type implants is wider than 60° and regular multi-unit abutments are insufficient. Angulated multi-unit abutments are also essential in cases with severe bone atrophy, when Rootform type implants must be inserted not perpendicularly, but angularly to the bone level, in order to achieve higher primary stability, to avoid sinus lifting procedure on the maxilla or to ensure nerve bypassing on the mandible.

Dental implant manufacture based on Open Dental Community members experience left in the system essential parts and because of it could offer products and services that are of the highest standard and at extremely competitive rates.

www.trate.com
info@trate.com

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ADVices

Doing business without advertising is like winking at a girl in the dark. You know what you are doing but nobody else does.

Steuart Henderson Britt

Infodent Infomedix International Publishing & Consulting House

AROUND IMPLANTOLOGY

3DIEMME

RealGUIDE Software Suite

Discover the World's first open system integrating 3D imaging, implants planning and prosthesis modelling applications on mobile devices and cloud environment

3DIEMME presents the new revolutionary dental imaging, surgical guides planning and prosthesis modelling application running on any device: PC, MAC and, above all, on mobile devices (tablet/smartphone, running iOS).

The new software suite, strong of 12 years of experience in digital dentistry procedures management and used by International Doctors and Labs to manage thousands of clinical cases per year, includes the following modules:

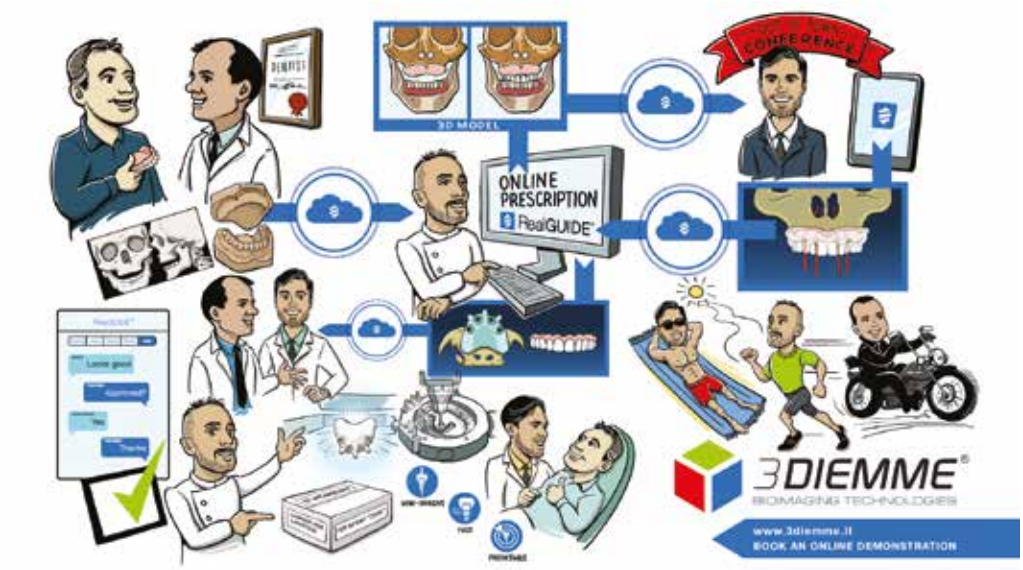
- RealGUIDE START: free application to collect all the Patient's data (DICOM images from CBCT/CT, STL files from intra-oral scanners or laboratory models acquisitions, pictures and documents), visualize them and manage the data upload to the cloud server and mobile applications

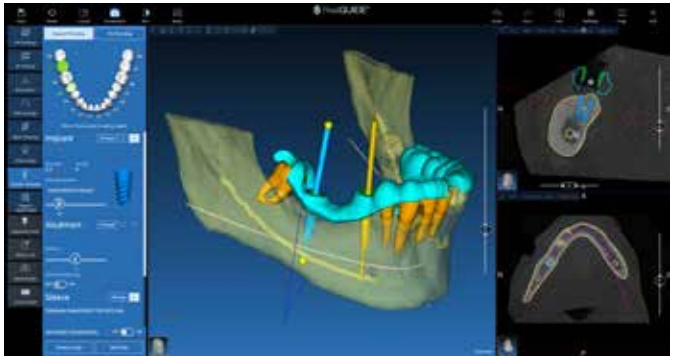
- RealGUIDE APP: easily view, plan, share and manage the digital treatment with the tip of your fingers, thanks to the beautiful and simple APP design

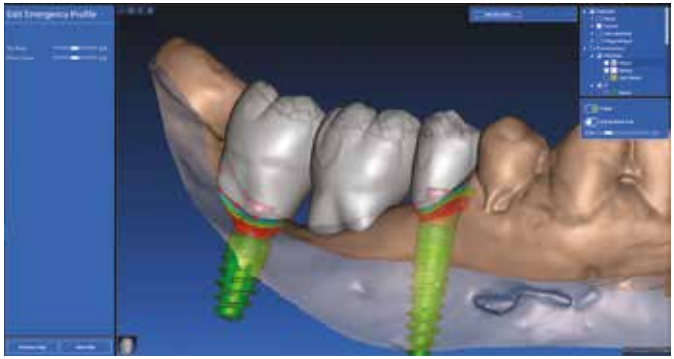
- RealGUIDE PRO: advanced 3D diagnosis, semi-automatic virtual teeth extraction and bone segmentation tools, implants planning from a full library including prosthetic components

- RealGUIDE DESIGN: surgical guides modelling, STL files processing, individual trays and models with implant analogues holes management

- RealGUIDE CAD: prosthesis design, including wax-up, crown







and bridges on teeth and implants, immediate loading prosthesis and reinforcement bars, custom abutments and much more! The new RealGUIDE software suite involves, through the cloud, all the figures in the digital dentistry world: the radiologist can perform a full diagnosis (also thanks to the new RealBODY 3D engine) and prepare the exam for the dentist that can easily share it with his laboratory to integrate the prosthetic planning and optical scans to the project. Starting from the complete virtual patient (including bone, gums thickness and ideal teeth positions) the doctor can plan the implants on his iPad or iPhone and share the project with other colleagues and the Patient as well. The final project can be sent back to the laboratory for the surgical guide modelling in the DESIGN module, as well as the provisional prosthesis modelling the CAD module or with any CAD/CAM system, thanks to the open project data exported in STL format from the 3DIEMME suite. The new CAD module, presenting many innovative features compared to the similar software packages on the Market, is also available as a stand-alone product and it includes ALL the prosthesis modelling related features in a single license.
The licensing system, mainly based on a subscription service model, is innovative and totally suited to the customer's needs, giving the chance to everybody to enter the digital dentistry world without huge software investments.

Main functions of the RealGUIDE APP:

- 2D/3D DICOM viewer (diagnosis and communication with the Patient)
- STL files viewer (from intra-oral and desktop scanners and for lab communication)
- **Implants planning** for guided surgery (and project uploading for surgical guides and immediate loading prosthesis manufacturing)
- Pictures viewer (JPG/BMP/PNG...)
- Online sharing and real-time chat with user defined private groups and social networks
- CLOUD data management and offline processing on any device (PC/MAC/mobile devices)
- Automated email and push notifications management for the project development status communication

The full suite can be customized and rebranded (OEM versions) for all the implants, CBCT and CAD/CAM Companies that want to integrate the most revolutionary digital dentistry application into their existing business model. In particular, thanks to the CLOUD environment, 3DIEMME can integrate the clinical projects management into the Company ERP and CRM systems; in this way all the information connected with the planning is directly sent to the dedicated Company Department in an uninterrupted workflow, reducing the risk of losing important data and involving the Production, Marketing, Administration and Sales Departments at the same time.
3DIEMME offers a full set of solutions that start from providing the digital modelling service Worldwide to creating dedicated software products and workflows to International Organizations, based on long term partnerships.

www.3diemme.it - www.realguide.it
biomed@3diemme.it

IT'S TIME FOR TRUE LOW DOSE CBCT

TRUE LOW DOSE is the latest X-Mind Trium CBCT innovation from ACTEON, with a consistent dose reduction for the patient (up to 50 percent less than standard modality) and no compromises in terms of image quality and accuracy.

Acteon's flagship CBCT equipment can achieve this results thanks to a new algorithm associated with an additional movement on the rotating gantry of the device which moves the sensor closer to the X-ray source, adapting to the anatomy of the patient. The result of this technology is an increased level of safety and protection for the patient without compromising the reliability and the accuracy of the diagnosis on both panoramic and CBCT acquisitions by keeping the same image quality as for standard dose exams.

X-Mind Trium is a 3-in-1 extraoral imaging device, it adapts to the growing needs of dental offices by pairing 2D panoramic with 3D imaging and digital cephalometric analysis when necessary.

The available fields of view for CBCT examinations, range from a small 40x40 mm at the ultra-high resolution of 75um, a reference for endodontic diagnoses, to a big 110x90 mm, ideal for example in implant or orthodontic surgical planning procedures.

Full set of different panoramic examinations is available, as well as cephalometric radiography options which offer simple patient positioning and the smallest physical footprint device

with cephalometric arm on the market. The device is powered by Acteon Imaging Suite (AIS), a complete tool for patient data management, capable of communicate with the main PMS softwares on the market and with PACS systems, unique environment for all the ACTEON imaging devices and open to others, thanks to its support to TWAIN drivers. The suite offers a powerful toolset for reporting and for 2D images editing, as well as one of the most complete 3D softwares (AIS 3DApp) on the market which allows a seamless integration of X-Mind Trium in the digital workflow of any practice thanks to its implant planning and surgical guide design functionalities, which are only a few of many others available.

The innovation offered by X-Mind Trium confirms ACTEON as leader in designing less invasive, less traumatic and most technologically advanced dental imaging solutions.

IT'S TIME FOR EFFICIENT 3D DIAGNOSIS

The cutting-edge technology of **X-Mind Prime**, ensuring unmatched speed of installation, unbelievable ease of use and high quality images, the whole dressed in a stilish and innovative look, is the key success factor of the device, lately entered to the products portfolio of Acteon. What users feel so amazing about X-Mind Prime are the elegance of its wall mounting concept, allowing its seamless integration in any kind of modern dental practice, as well as its reliability and user-friendlyness.

A new challenge in innovation won by Acteon.

www.acteongroup.com
info@acteongroup.com

Bastos Viegas SA
European manufacturer of disposable products

Bastos Viegas, S.A, is a modern and efficient production unit, with a very wide product range and a quality standard recognized internationally. Currently, the company employs about 400 persons in modern and functional premises, with a covered area of approx. 65.000 sq. m, implemented in a total area of 160.000 sq. m piece of land.
The company manufactures several product lines of disposable items for dental practice namely the following:
- Gauze and non-woven swabs in sterile and non-sterile formats.
- Absorbent cotton products such as cotton rolls and cotton balls.
- Protection products such as gloves, face masks, dental bibs, head caps, surgery and visitor gowns, shoe covers, headrest covers, dental chair covers, etc.
- Sterilization packing materials such as sterilization reels and self-sealing pouches and sterilization control devices such as control tapes and Bowie and Dick steam penetration tests.
- Surgery cover products such as utility and surgical drapes all types and shapes and equipment covers.
- Implant surgery sets that include all necessary needs of coverage in implant surgeries for healthcare professionals, patients, surgery site and surroundings to assure a perfect aseptic worksite.

Bastos Viegas has a high capacity for packaging and sterilization by steam and ETO, applicable to all products of his own production.

The laboratory for quality control is completely equipped for all the company needs and all the products produced, being managed by wide experienced and qualified staff.

The company runs 3 automatic warehouses, with a total installed storage capacity of over 18.000 palettes/containers, for production components and finished products. This allows a very high efficiency in distribution and sales service.

The company is certified by the norms EN ISO 9001:2008 and EN ISO 13485:2004. All products considered Medical Devices are registered and certified for the use of the CE mark.

Bastos Viegas is an independent, privately owned company, with a firm commitment to work in close co-operation with customers. It is our firm intention to keep our capacity, flexibility and organization for the best possible service in the approximately 100 countries where we have customers.

The company's objective is to keep and develop the concept of offering consistent quality made in Europe.

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Implantology and surgery: iChiropro, a revolution from Bien-Air

NEW BIEN-AIR SYSTEM
The only system that allows you to plan operations and place up to 8 implants simultaneously. Equipped with an application that is regularly updated with new features, the upgradeable iChiropro is a versatile and ergonomic system offering guaranteed efficiency. Micromotor with ceramic ball bearings, and contra-angle with an irrigation system inside the instrument. Straight handpiece with high rotation speed.

APPLICATION 2.1. The possibilities for developing your implantology and surgery system are endless – and free. New, innovative functions will be regularly integrated in your system as our applications are developed and updated.
MULTIPLE IMPLANT PROCEDURES. Up to eight implants can be placed simultaneously. The same step can be carried out on all the implants at once. Reduced handling of instruments and adjustments during the procedure. Increased efficiency.
PLANNING OPERATIONS. Option to plan procedures by adjusting the various parameters for each operating sequence in advance. Quick and easy import of planning data from the coDiagnostiX™ software (currently available for Straumann implants only). This reduces the number of adjustments made during the procedure and allows you to focus on the essential: the patient.
PRE-PROGRAMMED OPERATING SEQUENCES. The operating sequence settings for the main implant systems are integrated into a library that is constantly being updated. This ensures the procedure is carried out in accordance with the manufacturer's recommendations. Parameters can be changed at any point during the procedure.
MULTIPLE-USER INTERFACE. Management of multiple users with each able to save their own settings.
OPERATION REPORT AND PATIENT FILE. Operation data can be recorded at any time and is automatically integrated into the patient file. The data can be consulted directly on the iPad as a graph or table, and it can also be easily exported to other peripherals or online storage platforms.
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MULTIFUNCTION PEDAL. The iChiropro's highly ergonomic multifunction pedal offers speed variation, ON/OFF peristaltic pump, operating sequence or operation selection and micromotor rotation direction selection functions.
iPAD The iChiropro from Bien-Air is compatible with the iPad and iPad Air from Apple®. Pleasure, comfort and performance guaranteed, using the most popular tablet on the planet.

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• Bien-Air

Tornado TURBINE
SteadyTorque™ high power generator

The masterful engineering of the rotor's micron-precise shape and configuration, coupled with optimal air pressure distribution and exhaust flow, warrant the TORNADO an unrivaled 30-watt power output. To contribute to an impeccable user experience, the turbine's head is ergonomically compact and the sound level competitively low. This exclusive technology is complemented with specially-designed ceramic ball bearings capable of handling the highest speed and heaviest loads, guaranteeing the TORNADO superior durability and resilience.

The satisfaction of quiet effectiveness. The lowest on the market today, the decibel intensity of the TORNADO equals that of a peaceful Alpine stream, thanks to the noise-reducing properties of two novel features – the Accu-Spray Quattro Mix ™ spray system and the Accu-Chuck PreciPlus ™ vibration-canceling bur-retention mechanism.
This soft, almost reassuring sound is intended to help even your most apprehensive patients feel at ease, all while protecting and preserving your hearing.

The TORNADO expediently satisfies the most extreme speed and torque demands while maintaining strict Swiss precision standards.
Accu-Spray Quattro Mix ™ with LED illumination: with minimal noise interference, this new system converges four asymmetrical laser-precise air/water sprays onto the tip of the bur for rapid and even cooling of the operative field. Combined with a LED light, unobscured intraoral visibility is guaranteed. Accu-Chuck PreciPlus ™ bur-locking and rotation drive mechanism: this revolutionary technology assures a staunch clamping of the bur, eliminating all vibrations, and granting the TORNADO unequaled stability and comfort for the most precise dental work. Conversely, bur-release is made quick and safe, thanks to Bien-Air's unique Soft Push ™ system.

The TORNADO features advanced technologies to keep patients safe and clinicians serene.
Sealed Head ™ contamination control: In combination with an anti-retraction valve, this wear-resistant mechanism prevents oral fluids and other organisms from infiltrating the instrument's head, water lines, and treatment unit. This abates the risk of patient cross-contamination and noticeably prolongs the ball bearings' lifespan.
Cool Touch™ safety: Conveniently integrated into the head's push button, this patented anti-heating technology is designed to maintain the instrument's head at a safe temperature, thus significantly decreasing patient burn injuries.

Size and Weight:
The optimal diameter and height of the head facilitates maneuverability and posterior access. The TORNADO's comparatively lighter weight pushes the limits of comfort even further with more balanced manipulation and reduced hand and wrist fatigue. TotalTact ™ coating: This smooth hygienic nonslip coating presents elevated resistance to scratching and abrasion and with- stands the high temperatures of repeated autoclave sterilization cycles.

www.bienair-tornado.com

Bioteck
ACTIVABONE® Bioteck new generation bone pastes

Bone substitutes include allografts, xenografts and synthetic materials that are used to compensate bone loss or to fill bone voids. Ideally, a bone substitute should have specific chemical-physical features and biological activity in order to promote a good clinical outcome. Biologically, it should mediate recruitment of bone forming cells and precursors (e.g., mesenchymal stem cells, osteoblasts) derived from host site, and have bioactive effects on neo-osteogenesis. Furthermore, it must be osteoconductive, providing three-dimensional matrix for the ingrowth of blood vessels and cells. Finally, it should be resorbable, in a way that is finely regulated and overlapped to newly-formed tissue appearance. Clinically, a bone substitute should be easy to use, cost effective and with adequate healing performances.

Resorbable, bioactive bone-compatible biomaterials are indicated for reconstruction of bone critical-sized defects when a significant amount of new tissue regeneration is required. These cases include severe bone loss, fractures and tissue voids. Recent advancements in heterologous bone graft substitutes are playing a growingly important role in large bone defects and gap healing, as they are potentially able to overcome the disadvantages of current medical practices. The primary purpose of these novel grafts is to promote and support the natural bone healing process, which otherwise would not properly occur over critical-sized defects.

Due to their chemical and structural similarity to the mineral phase and to the whole extracellular matrix of native human bone, xenografts show ideal osteoconductivity and biocompatibility. In addition, the interactions of osteogenic cells with these biomaterials lead to optimal osseointegration and bone regeneration.

Recently introduced ACTIVABONE® bone substitutes are innovative bone pastes made of equine bone matrix. The addition of a proprietary innovative hydrogel, namely **Exur®**, as a carrier greatly improves handling, injectability, mouldability and the ability to uniformly fill defects, then promoting effective bone tissue reconstruction.

Hydrogels provide a structural network to facilitate three-dimensional and homogenous bone particles distribution within any defect size or shape. Moreover, highly hydrated hydrogels can mimic chemical and physical environments of extracellular matrix (ECM) and therefore, once implanted, represent ideal cellular microenvironment for cell proliferation and differentiation. Most important, injectable hydrogels have a similar microstructure to the ECM and allow good physical integration into the defect. Several natural polymers (e.g., collagen, hyaluronan, alginate) are widely used for tissue engineering approaches due to their high biocompatibility.
In the last three years, Bioteck R&D has focused its efforts and attention to medical grade polymers commonly used in pharmaceutical applications and developed an innovative proprietary technology to control their synergic polymerization.
The ability to regulate the polymerization and cross-linking density of polymers has provided the flexibility and tailorability to these hydrogels for avoiding granules dispersion and loss during surgery, for assuring complete filling and direct contact with the tissue surrounding the defect and successful bone repair.
Indeed, HPMC, PEG and the chemically similar PEO-based hydrogels undergo a polymerization reaction by physical sterilization, which can be modulated by introducing very limited amount of a specific anti-oxidant molecule.
In order to modulate polymerization and visco-elasticity of sterile ACTIVABONE bone pastes, a subsidiary amount of Vitamin C was added to hydrogels, acting as a so-called visco-modulator agent (bio-modulation). Vitamin C is able to limit intra- and inter-molecular rearrangement of PEG and HPMC polymeric chains as a consequence of sterilization, then specifically tailoring rheological performances of hydrogel carrier.
The possibility to select specific polymers molecular weight and concentration, as well as finely tuned Vitamin C amoun-

ts, therefore will allow Bioteck to design unique sterile bone fillers with different physical and handling properties, either injectable or mouldable bone substitutes.

In this way, Bioteck new generation bone pastes will be extremely versatile and functional, having biological and bio-mechanical properties, texture, malleability and controlled adhesion, such as to fit the specific geometry of the bone defects of any size or shape.
Furthermore, there are no limitations of use of the new hydrogels: Bioteck biomaterials will allow access to multiple applications, while providing new opportunities for surgeons and especially for patients. With this technology one can obtain extremely fluid injectable bone paste or, on the contrary, a very dense formulation, according to the specific directions of use; malleable pastes are also a possibility to meet the most disparate and challenging surgical requirements.

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BOREA

With Rayplicker™ say «Yes» to digital dentistry!

Borea is a French company that designs, manufactures and markets dental shade-taking devices. Borea's mission is to provide dental surgeons and laboratories with innovative solutions to improve comfort and quality in their day-to-day practice.

The flagship product of Borea is "The Rayplicker™". This solution allows to obtain in a single acquisition complete shade mapping and translucency of a tooth. Visualize easily the tooth overall shade, a 3 or 9 parts shade or a detailed mapping pixel by pixel. The dental surgeon or the dental technician can, thanks to the Rayplicker™, take the color in a reliable and reproducible way, without influences of the external environment. To complete this shade-taking, a dedicated mobile application "Rayplicker™ Pics App Solution" offers the possibility to attach pictures of the patient's mouth and face and to edit and send an objective and complete order to the laboratory.

The Rayplicker™ software allows thanks to a Cloud connection, a direct link with the laboratory in real time, the transmission of all the necessary technical data and ensures the traceability of the latter. This software enables image treatment tools as well for an in-depth color analysis.

Rayplicker™ also offers the possibility of choosing its reference shade guide. Equipped with a patented measuring head, its sterilizable tip enables the device self-calibration and guarantees the user against all cross contaminations.

Rayplicker™ is the easy-to-use solution for fast and reliable shade-matching. Its intuitive interface, user-friendly features and ergonomics make it the necessary device in every dental practice and labs.

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Ultra accurate pixel analysis.

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Patented technology offering objectivity and repeatability.

Hygiene
Protective sheats, sterilizable calibration tips.

Digital files
To ensure better traceability and sharing without loss of information.

Ergonomy
Touch screen, miniaturized measuring head.

Plug & Play
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Flexibility
Configure the shade guide of your choice. Up to 4 user profiles.

State of the art
Impress your patient.

BOREA

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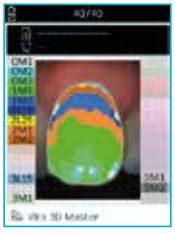
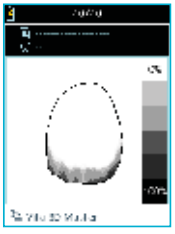
Overall shade

3 parts mapping

9 parts mapping



Detailed mapping



Translucency

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A008/en 01/20

BOREA

RAYPLICKER™: THE BEST WAY TO CHOOSE THE RIGHT COLOR

Shade-taking is currently realized in an empirical way with manual shade guides. Exposed to the difficulty and subjectivity of this color-taking, Borea designed, developed and markets the «Rayplicker™». User-friendly, fast and precise, this color-taking solution fits as an innovative concept of communication and interaction between dentists and laboratories. An indispensable tool for dental practice, filling in the missing brick in the digital workflow by combining quality, traceability and reliability. This solution enables to obtain, in a single acquisition, all the color information necessary for the aesthetic integration of the ordered prosthesis.

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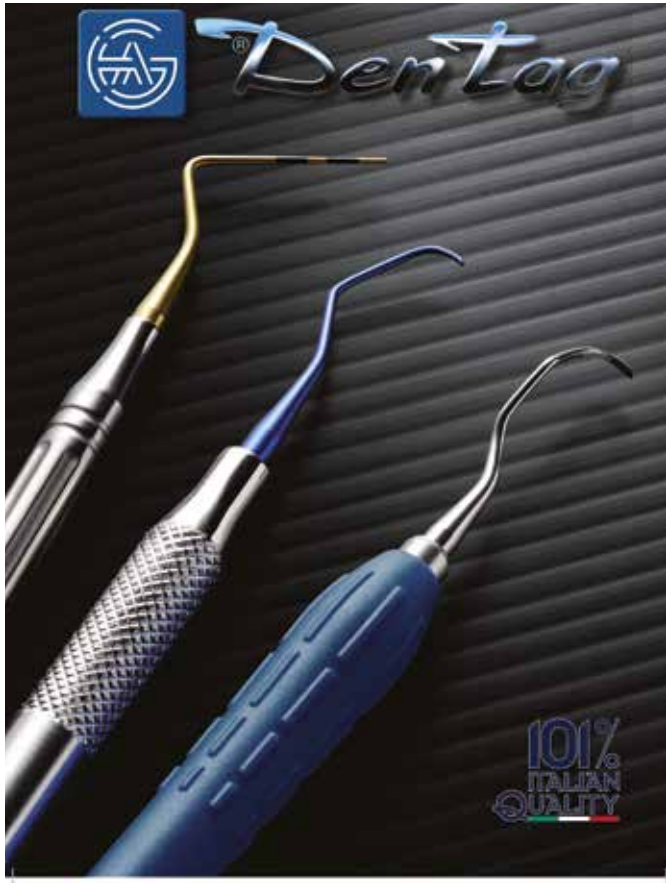
DENTAG

Want a job well done? Trust in a serious professional with proven ability and experience. But above all, provide him with instruments of superior quality, so that his skill and knowledge can be used to the full. The final result will surely be of the highest quality, aesthetically beautiful and achieved in a shorter time than expected. This has always been the guiding philosophy of our production. We do not produce implants but a huge part of all instruments needed for the preparation of the site and the subsequent correct placement of implants. This means that many instruments are designed and produced in conformance with the specifications required in the different implantation techniques and the relative procedures. To do this, one must be particularly versatile in design and production.
Now we would like to give you a brief introduction of DenTag



Renowned throughout the world for its traditional craftsmanship and superlative quality of its knives and scissors, the small town of Maniago, in northeastern Italy, is the home of **DenTag**. The Company was established in the early 1950s by a team of expert artisan knife-makers and, as may readily be imagined, knives and scissors were their very first products. Soon thereafter, the ambition and vision of the founders pushed the company towards another direction, diverting its attention to the manufacture of high-quality surgical and dental instruments.
The raw materials – stainless steel, aluminum and titanium – are carefully selected. Hardening and sharpening techniques for which craftsmen of Maniago have been famous for generations have been applied in their precise manufacturing of instruments. During the years, **DenTag** establishes many contacts with universities and final users, to adapt and modify its own production to continuous changing requests of a demanding market. The result was an increasing expansion through the Italian and foreign market, so at the end of the '80s the company moved to a new and bigger plant. The success of **DenTag** is due to its continuous and steady investments in research and quality. During the years, digital control machineries were introduced and many manufacturing processes automated. Moreover, computer – aided design was introduced, and the entire production cycle is computer controlled, even the packaging process and the final LASER marking phase.
Despite this, at **DenTag** final testing and control procedures are made by expert craftsman, trained within the company, as certain phases are particularly important and delicate in terms of quality. Today, DenTag offers a varied amount of new items, with different aesthetic features, and it is known for its high quality level, which is able to satisfy the most demanding customers.
DenTag has obtained UNI EN ISO 9001 Q.S., and UNI EN ISO 13485 Medical Devices certifications, and it is recognised by FDA "Food and Drug Administration" for products exported to the United States. Thanks to its focus on quality, **DenTag** today produces surgical and dental instruments for several companies in Italy and abroad, as well as a range bearing its own brand.
Given the highly-specialized nature of its products, DenTag receives requests for new instruments – on a nearly daily basis. For this reason, research specifically focuses on the manufacture of instruments that are innovative in every way – in their shape, the materials used, and in the surface finish.
We are firmly convinced that quality will have an increasing im-

portant and predominant role, in a market which is becoming more and more globalized, and we will continue to achieve this goal. We are firmly convinced that, during this third millennium, the concept of total and real quality is destined to become increasingly vital, especially in light of the extraordinary level of globalization that is rapidly becoming the dominating factor in the market. We will continue to achieve this goal with versatility and continuous research into innovative production technologies. It will be the basis for expansion of DenTag in this field.

Following it we introduce our new line of instruments "EVO"
DenTag always produces surgical and dental instruments... using stainless steel.
Over the years, we have produced, for us and others, innumerable variations of instruments. We have also started the production of tools in aluminum, titanium and with inserts in hard metals but always working in the field of metals. We believe, in our little experience, to have built a recognized standard of quality and reliability.
However, we always pay attention to changes and trends in the market that evolves rapidly and sometimes suddenly.
Cyclically we receive requests for instruments lighter but at the same time as reliable as those made of stainless steel. Not being able to change the material used for the tips, to lighten the devices, we can only works on the handles. That is why we started to manufacture an entirely new line of light material handles. Clearly this solution is already used by others before us so that, in the design, we started to study the state of art, trying to take advantage and, if possible, improve the positivity and correcting any errors, if we found.
The result of this search is the EVO family of instruments with handles which has, we think for the first time, several positivity together:
· **Material**: Lightweight (11 g) and resistant to stress. Use turns out to be easy, for sure grip and non-fatiguing. Tested and used in the food field, then completely non-toxic and free of potentially harmful substances. Autoclavable without change of shape and color.
· **Form**: 10.5 mm Diameter of the handle and the center of 9.0 mm to minimize the problems to carpal tunnel data from prolonged use in time. Longitudinal notches to increase the grip and the sensibility.
· **Construction**: We have inserted during molding of the handle, two stainless steel bushes suitably shaped, in which the tips are then introduced. With this procedure will eliminate the presence of an internal longitudinal metal bar with obvious reduction in weight. The tips are not glued to the material and so there is no risk of potentially harmful substances are released.

· **Aesthetics**: Profile simple, easy to wash and clean. Without deep grooves or notches that may cause accumulation of germs and bacteria. Since plastic is possible to color in various shades aesthetically pleasing and with advantages for the immediate recognition of the instrument.

It is known that simple dental instruments such as curettes or double probes may injure the operator's hand or lacerate the glove (with the opposite working points). The possibility of injury is during use, handling or passing the instrument between Assistant-Dentist-Assistant while performing the procedures on the patient. Directive 2010/32/EU - prevention from sharp injuries in the hospital and healthcare sector, also it states that it's necessary to prevent workers' injuries caused by all medical sharps and pointed devices. Instruments with a handle 100, 105 mm are too short and the tips, even if they are turned contrary than working one, very often touch on the back of his hand. Instead, what it can do as an additional preventive action is to choose, when buying or replacing, one instrument with a long handle. The longer instruments can be wrapped exactly like the other and, in the event that the dentist use cassettes or trays for sterilization of small size, it will be sufficient to put the instruments in the direction of the longer side. That's another reasons to choose new DenTag "EVO" family of instruments. As always we are respecting our quality standards and, we are proud of, 101% Italian quality.

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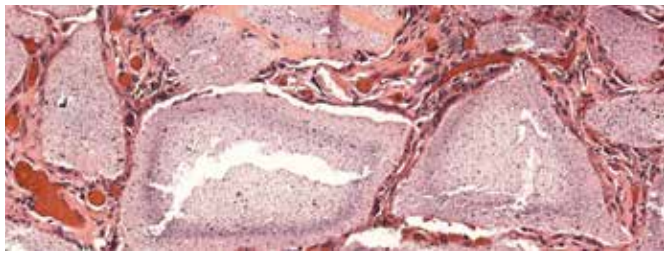
[1]**Source**: *CEPID - Centro de Ensino e Pesquisa em Implantes Dentários. Universidade Federal de Santa Catarina. Prof. Dr. Ricardo Magini e equipe. 2018.*

FGM DENTAL GROUP 25 YEARS

FGM Dental Group: Nanosynt

Hydroxyapatite is known for being the main mineral present in bones and teeth. Besides its structural function, it favors cellular adhesion due to its surface capacity to adsorb bioactive substances. Within that context, biomaterials with a formula based on beta-tricalcium phosphate and hydroxyapatite are widely utilized in bone regeneration procedures.
That choice is due to its excellent characteristics, including bioactivity, osteoconduction and the similarity in its composition with the mineral phases of the bone and dental tissues. Those properties are constantly studied with the purpose of improving the response from the body during the process of cellular remodeling which happens after the implantation of the biomaterial.



Bone formation promoted by Nanosynt is not only fast but with very high density. Microscopic images show a great quantity of cells deposited on the surface of the biomaterial just 30 days after the implantation, in an initial process of the area remodeling and bone matrix deposition.
This superior clinical performance is justified due to the physical-chemical and structural particularities associated to the product, which combines different calcic crystals (of fast and low degradation) disposed in a highly permeable trabecular structure, which is hydrophilic and also offers a surface that facilitates cellular adhesion.

Author: Bruno Alves Paim, *Researcher at FGM Dental Group*

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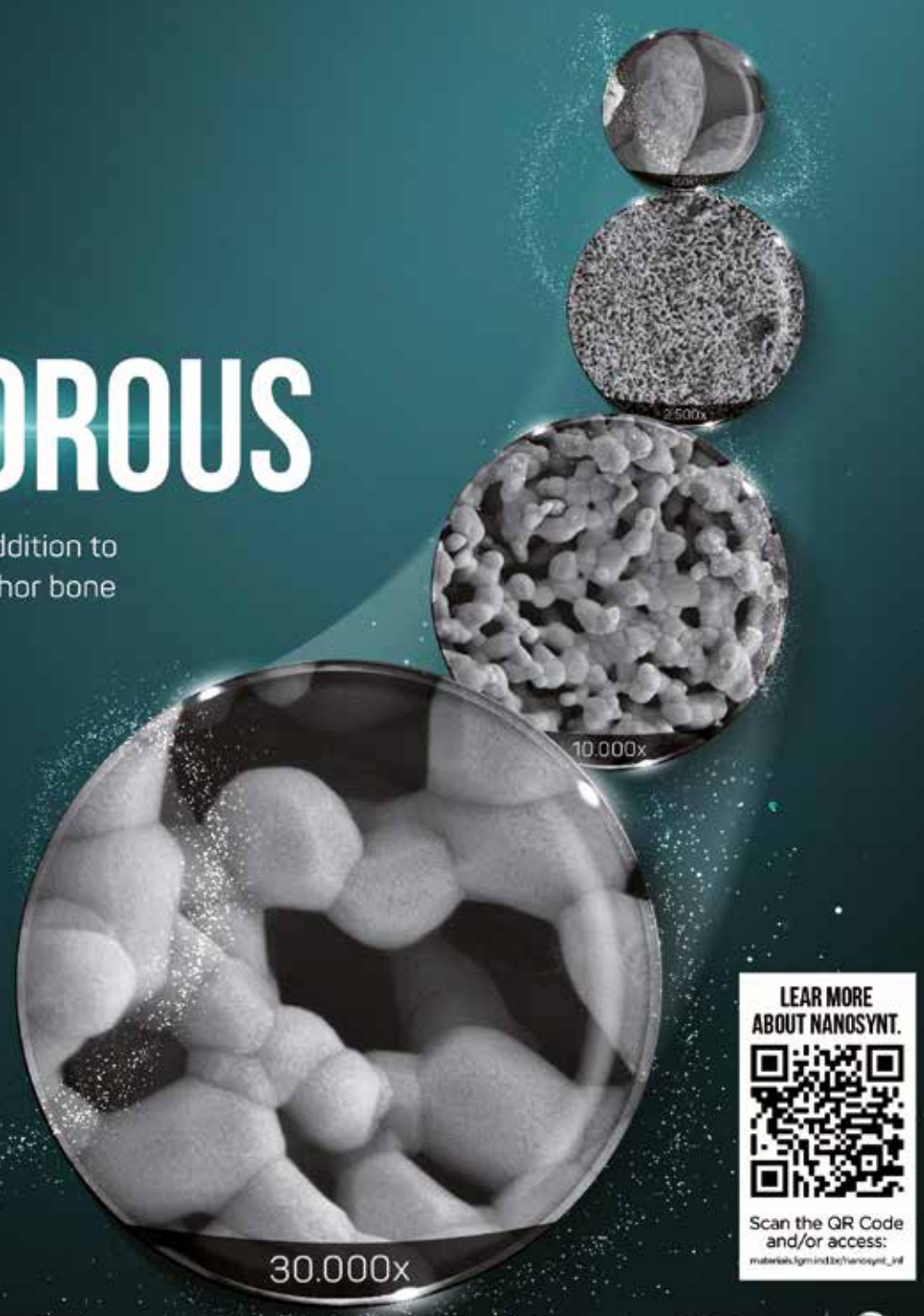
FGM

Nanosynt

BONE GRAFT

ULTRAPOROUS

Its ultraporous morphology, in addition to allowing blood flow, helps to anchor bone cells to form new bone. [1,2]



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[1] Study conducted by Mônica Calasans - UFF. Fonte: Lizarbe MJ et al. Randomised clinical trial for the biological evaluation of two nanostructured biphasic calcium phosphate bioMaterials as a bone substitute. Clin Implant Dent Relat Res. 2017;1-10. | [2] Study conducted by Paulo Coelho - Universidade de Nova York. Fonte: Freitas G, Tovar N, Granato R, Mann C, Coelho PG. NanoSynt. Avaliação histológica e histomorfométrica de um novo substituto ósseo. O uso da nanotecnologia na conquista de um melhor padrão de osteocondução. Implantnews. 2014; 11(3):296-301.

FGM DENTAL GROUP 25 YEARS

O_3IMPLANT® & LINDA®

Ozone therapy devices for implantology and clinical practice

Today there is an increasing usage of dental implants in order to replace a missing tooth or multiple teeth. It is an involved, invasive operation that takes time to resolve so, keeping everything healthy and free from infection, is a key condition. That's where ozone therapy comes in.

The usage of **ozone in dentistry** has been proposed because of its **antimicrobial, disinfectant, oxidant** power and healing properties. Thorough its **natural** germicidal action, **ozone** can **kill** more than 166 between **bacteria, viruses, fungi and spores, pathogenic microorganisms** acting as infection prevention and immunostimulant action.

OZONE THERAPY & DENTAL IMPLANTS

The dental implant is a long invasive surgery procedure with a high **risk of infection**. It doesn't matter how advanced our equipment or how clean we and our efficient tools are, **bacteria are a constant threat. Ozone** damages, through the oxidant power, the viral capsid and interrupts the reproductive cycle by preventing contact between the virus and the cell. **Ozone** can also kill bacteria by attacking its protective membranes. By using ozone therapy when performing a dental implant procedure, we can ensure your mouth is kept **infection free** for the longest time. The ozone treatment is painless and increases the patients' healing. **Ozone** can be applied as a gas or in water form. By using ozone therapy devices, **O_3IMPLANT®**, ensures constant and repeatable conditions of use, guaranteeing the absolute purity of the gas supplied and the maximum reliability. Certified as *"Medical Device as per Directive 93/42 / EEC and S.M.I. in IIA class"*, **O_3IMPLANT®**, is in compliance with the protocols of the Scientific Society of Oxygen Ozone Therapy **SIOOT**, thanks to the specific software configuration. Through **O_3IMPLANT®**, the ozone can be bubbled into the bones, wounds and soft tissues by decontaminating any kind of pathogenic agents. This procedure ensures the implant itself and the surrounding tissue is as **clean** as it is currently possible to be. This is a huge step in promoting the **fast healing** and continued comfort of your dental implant. **All by using a completely natural gas.**

RISK OF CROSS-CONTAMINATION

However, there is not only a risk of infection in individual's oral cavity but also the **cross-contamination** has been considered an important topic in dentistry. Cross infection to **dental staff** can often occur due to the existence of microorganisms from patient's blood and saliva on dental tools as well as patient's oral residuals. **LINDA®**, new Galbiati's product can be used against the microbial contamination of both water and air. **LINDA®** disinfects spray instruments, clinic rooms, ultrasonic cleaner, horizontal and vertical surfaces, including furniture and furnishings, for dental unit water bottle, waiting rooms. **Effective against all pathogenic organisms** (e.g. **Legionella and E. Coli**), ozone is particularly recommended for the **water sanitation** process, ensuring a **real, natural and complete disinfection.**

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Ozone in dental clinic, water clinic sanitization H3O BLACK by GALBIATI

Ozone has been successfully used in dental field for over twenty years. The applications mainly concern two aspects: ozone as a natural alternative to traditional disinfection and sanitization chemical processes and the oxygen-ozone therapy to treat patients affected by various diseases. From June 26th 2001, ozone has also been recognized by the American FDA (Food & Drug Administration). Thanks to the oxidation power, ozone kills bacteria by attacking its protective membranes. Ozone can also penetrate the internal structures of viruses, preventing their replication.

Dental unit waterlines (i.e., plastic tubing that carries water to the high-speed handpiece, air/water syringe, and ultrasonic scaler) promote bacterial growth and development of biofilm due to the presence of long narrow-bore tubing, inconsistent flow rates, and the potential for retraction of oral fluids. Dental health care personnel and patients could be placed at risk of adverse health effects if water is not appropriately treated.

Microbiologically contaminated water may be a risk factor for the dental team and patients, since they exposed to water and aerosols generated from dental units. This is particularly important in view of the increasing numbers of medically compromised and immunocompromised patients receiving regular dental treatment.

All dental units should use systems that treat water to meet drinking water standards.
According to this statement Galbiati R&D department has realized **H3O BLACK**, an ozone generator, specifically designed for ALL dental clinic water sanitation.

Through the use of ozone, the water flowing from dental units is completely purified and sterilized, so that all pathogenic organisms are eliminated. As triatomic molecule of oxygen, ozone, unlike other substances, turns into oxygen in a short time, without residuals. That's why ozone is the ideal disinfectant means for the latest sanitization and potabilization requirements.

Effective against all pathogenic organisms (e.g. Legionella and Escherichia Coli), ozone is particularly recommended for the water sanitation process, ensuring, more than all other systems, a real and complete disinfection. Ozone has a strong bactericidal action, thirty times higher than chlorine. The disinfectant action of this gas meets the requirements established by the hygiene standards, as it prevents the formation of biofilm, incrustations and mildew, as well as the formation of bacterial strains. H3O BLACK consists of an ozone generator and a mixer water unit, all in a powerful and compact size device. Ozone is added to the network water during the flow, so that water comes out totally sanitized.

This latest generation device is made of innovative materials and is entirely designed and produced in Italy.

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SmartBone®
The next frontier of bone regeneration

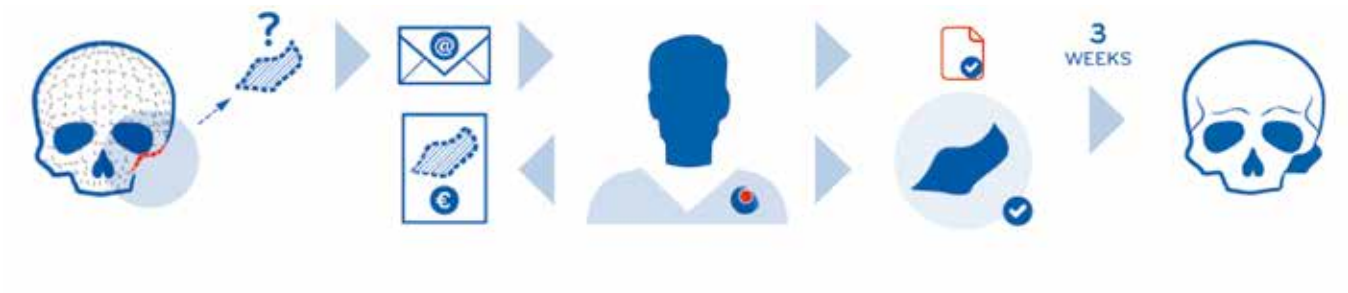
SmartBone® is a bone substitute produced by the swiss company IBI SA (Industrie Biomediche Insubri SA).
The company focus is on research, development and production of medical devices for tissue engineering and regenerative medicine: substitutes, grafts, 3D matrixes and 2D scaffolds. IBI SA pays extreme attention to safety and quality, for this reason is ISO13485 certified.
In 2012, SmartBone® entered the market by confirming itself as an innovative composite biomaterial developed for bone regeneration in reconstructive surgeries.
SmartBone® is available in different shapes from blocks to microchips. It is produced by combining:

- Spongious bovine mineral matrix
- Resorbable biopolymers
- Collagen fragments

Thanks to its composition, SmartBone® can hence be categorized as a composite xeno-synthetic graft.
This xeno-hybrid composition guarantees exceptional biomechanical properties and promotes osteogenic process to obtain optimal and fast osteointegration. After grafting, SmartBone® is totally resorbed and replaced by patient's own bone once remodeling process is completed.

SmartBone® blocks have impressive mechanical performances:

- Withstand heavy surgical manoeuvres;
- Allow very precision shaping with any type of surgical tools;
- Have high loading resistance;
- Offer high tenacity to screws fixation and have high volumetric stability.



Its 27% open-porous microstructure mimics the human bone ones and promotes the patient's cells to efficiently colonize and to quickly grow into SmartBone®, while its biopolymers degrade, providing a perfect integration and osteoconduction. SmartBone® microchips can be easily mixed with patient blood to obtain a paste capable of being shaped for a better site filling.

SmartBone® was designed to reduce the inner variability that many other bone substitutes have, due to their natural origin. IBI SA offers homogeneous bone substitutes with regular microstructure, porosity, density and mechanical properties.

Industrie Biomediche Insubri SA provides also another service, according to the 93/42/CEE Legislation regarding custom-made medical devices, the so-called SmartBone® On Demand™.

SmartBone® on Demand™ is the custom-made bone grafts line, designed specifically for the needs of each patient, especially developed to manage complex cases. The perfect contact between the graft and the recipient site improves the integration: it allows a correct application of guided surgery techniques and lets to reduce surgery time, difficulty and risks.
4 steps to get your custom-made graft:

1. Take a CT Scan of the Patient concentrating on the defect.
2. Send the CT Scan in DICOM format to IBI-SA with a brief clinical description. IBI's trained Engineers will get in contact with you, discuss the plan and You will receive a commercial offer for your plan.
3. IBI's trained Engineers, in conformity with your indications and suggestions, will design the graft until you are satisfied from the design.
4. 3 weeks later you will receive your graft ready for the surgical intervention. No sterilization or extra shaping required.

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, specifically designed for every kind of surgery;
- Helps you to resolve complex situations;
- Saves your time during surgery;
- Reduces your patient's risks;
- Helps you to reduce surgical costs.

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JEILMEDICAL Corporation provides a comprehensive line of high-quality products for Guided Bone Regeneration.
JEILMEDICAL has been developed in partnership with key opinion leaders to be innovative, technically advanced and lead to predictable patient outcomes.
GBR System consists of **bone screws, bone-tac, mesh plate and instruments.** Bone screws are made of a titanium alloy(ASTM F136), and the mesh is made of titanium(ASTM F67).

Bone Screws
Wide Head Screw (Ø1.4) – Fits better to GBR mesh and membrane thanks to the wider head.
Self-drilling Screw (Ø1.4 / Ø1.6) – Simplifies screwing process.
Tenting Screw (Ø1.6) – Creates and secures the space for bone graft
Mini Screw (Ø2.0) – Self-tapping screw
J-Tac – Tacking system for stabilizing a membrane on maxilla / mandible. Its dome-shaped head and barbed pin keep the membrane anchored on the bone after operation.

Meshes
Forms the space to protect the graft. Multiple pores on the mesh not only help blood supply but also minimize soft tissue exposures. Mesh can be cut to size depending on surgical needs.

Horizontal Smooth Bending Mesh
- Enables horizontal / vertical bone volume augmentation of implants site for guided bone regeneration. Its extra thin thickness and pre-cut design offer flexibility and shaping. Doctors can utilize this for multiple array of teeth cases, and also can fulfill bone formation and spatial retention for stable implant.

Fixation Hole Mesh
- Can be used as an alternative to a membrane, and also enables simultaneous GBR with dental Implant. Doctors can remove unnecessary edges.

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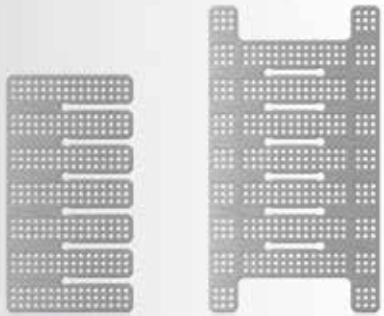

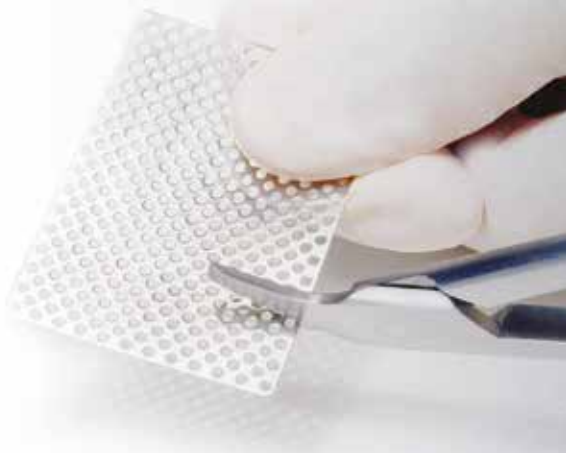

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Influence of red laser light (635nm) on dental implants stability

Jacek Matys

DDS, Ph.D., MS in Lasers Dentistry (EMDOLA), Laser Laboratory at Dental Surgery Department, Medical University of Wroclaw, Poland

In the recent decade, implant dentistry revolutionized a dental market and allowed patients to reconstruct their dentition and increase the quality of life. A dental implant is a fixture using for missing tooth restoration. In accordance to a dimension, we can divide implants to extra-narrow (<3mm), narrow (3-3.75mm), standard (diameter 3.75-5mm), wide (>5mm) or extra-short (<6mm), short (6-10mm), standard (length 10-13mm) and long (>13mm). Furthermore, micro-screws (mini-implants, micro-implants) with a diameter in a range of 1.2-1.8mm are utilized in orthodontics. Implants stability is a crucial factor enabling their immediate or early loading.

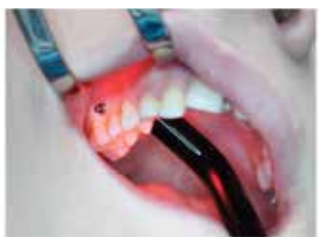

Fig.1 *Photobiomodulation at mini-implant site.*

Fig.2 *Photobiomodulation at regular implant site.*

Implant stability is described as biomechanical stability upon implant insertion and depends on bone formation at the peri-implant zone.

The level of gained primary stability of dental implants is strictly connected bone quality and quantity, implant morphology, and surgical technique.[1]

After implant placement, the bone healing divided into three phases: inflammation, reparative phase, and remodeling. The first post-implantation period (inflammation phase) lasting two weeks is critical in terms of treatment success. During that time, migration of mesenchymal cells, development of a provisional matrix and fibers can be observed. The process of fibroplasia and angiogenesis starts after four days, and a provisional connective tissue begins to grow.

Finally, a new woven bone is seen on the implant surface at the end of the 2nd week (first phase of the osseointegration process). Inadequate implant primary stability effects in developing fibrous tissues in the peri-implant area leading to bone resorption and even implant failure[2]. To diminish the risk of failure in implant dentistry especially for a low-quality bone some modern technologies/ devices could be employing.

Many studies have revealed that the LLLT (photobiomodulation) is a non-invasive therapy that can take part in the proliferation of fibroblasts and osteoblasts and, therefore, in bone healing, as well as increasing peri-implant bone density.[3–6]

In our recent study, we assessed the effects of photobiomodulation (LLLT) on implant stability and bone density after peri-implant irradiation with a 635-mm diode laser (SmartM PRO, Lasotronix, Poland) at an energy dose of 4J (8J/cm2) using Periotest device and CBCT analysis.

The main finding of the clinical study was that the implants irradiated with a 635-nm diode laser accounted for significantly higher secondary stability (after four weeks) and bone density (after 12 weeks) in contrast to non-irradiated implants/sites.[6]

Furthermore, in another randomized clinical trial, we analyzed the effect of a 635-nm diode laser on the stability of orthodontic micro-screws. We obtained significantly higher secondary stability (after 30 and 60 days) in comparison to the non-irradiated implants.[5]

In conclusion, the recent studies showed the diode laser at a wavelength of 635-nm enhances the secondary stability of regular implants and orthodontic micro-screws and peri-implant bone density.

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XIMPLANT
Currents decontaminator in the treatment of infected peri-implant and periodontal sites.

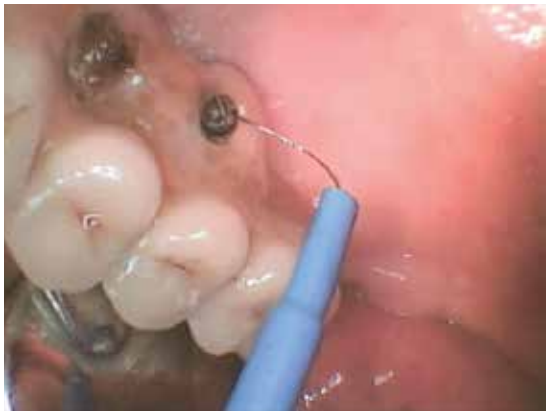
Doctor Paolo Calvani* and Doctor Cesare Paoleschi**
** Freelance in Florence*
*** Dentist, freelance, founder of IRIS Dentistry Company*

This article presents a new decontaminating method through the application of currents for the decontamination of infected peri-implant and periodontal sites. The method is called the **XIMPLANT system**. The current treatment technique provides precise protocols, in terms of timing and intensity of automated currents, for each type of application, such as to carry out a non-invasive and non-traumatic treatment for healthy tissues. The concept of the treatment is based on the physical action of destruction of the bacterial biofilm. The "electrode" effect of the system is exploited, thus developing a current around its surface which decontaminates it. These treatments are performed "closed" without local anesthesia.

The **XIMPLANT system** involves contact with the active electrode on the implant, which is "crossed" by a high frequency electromagnetic wave that breaks the biofilm acting on the entire surface of the implant. In fact, it should be remembered that titanium has an ionic conductivity subjected to a potential difference of 3%, sufficient to induce the ionic movement on its surface, such as to induce the destruction of the bacterial biofilm.Peri-implantitis represents a pathology that poses serious survival problems for a high percentage of prosthetic rehabilitations on implants. The bacterial flora forms a biofilm that undermines osseointegration by inducing a resorption of the peri-implant bone which, in the long run, leads to the loss of implant anchorage, as in periodontitis occurs for a natural element. The bacterial flora in question is the same responsible for periodontal problems.

The formation of the biofilm begins with the adhesion of microorganisms to a surface. When a certain amount of bacteria accumulates on a surface and reaches a certain cell density, it begins to secrete a substance which is basically a polymer made up of polysaccharides, proteins and DNA. This substance mixes with the water present in the environment and gives rise to a matrix where bacterial cells are strongly rooted in the form of biofilms. Peri-implant mucositis occurs in about 80% of subjects and in 50% of implants. Peri-implantitis occurs in 28% and in a percentage greater than or equal to 56% of the subjects (Zitzmann, Berglund T. - J Clin Periodontol 2008 Sep, 35 (8 Suppl) 286-91). Currently, the therapeutic treatments of peri-implantitis involve mechanical maneuvers associated or not with topical and / or general pharmacological treatments, such as antibiotic therapy.

Prevention actions are essentially based on home and professional hygienic maneuvers, in order to prevent irritative spines from which bacterial colonization can start, first of the gingival sulcus, creating a mucositis, then of the peri-implantation creating frank peri-implantitis. In the initial stage of mucositis, bone resorption is usually of little entity, but the bacterial biofilm already extends to affect the deep implant surface, that is, a contaminated area that is not evident in this phase with instrumental examinations. It is precisely at this stage that it is interesting to have a device available that allows the "breaking" of the bacterial biolfilm along the entire surface of the implant, even the one where bacterial colonization has not yet caused pathology (not visible.) In fact, even managing to remove the biofilm in the exposed parts of the implant, one does not act on those bacteria that colonize the perimplant in the areas where it is still anchored to the bone, but since the surface of the implant is an easily etched surface, it allows maturation and bacterial aggregation. Also, even in the face of "frank" peri-implantitis with bone resorption and suppurative state, an instrument that allows the deep decontamination of the implant and of the deep peri-implant areas would be particularly effective from the point of view of survival of the implants themselves. Until now, this profound preventive-therapeutic action was not feasible.



Treatment methodology

Once the infection and the stage of mucositis and / or frank peri-implantitis (probing depth, plaque index, bleeding index) have been diagnosed, professional hygienic treatment is carried out. At the end of the peri-implant toilet, the active electrode is applied to the implant collar. The ground electrode is held in the patient's hand. The **XIMPLANT** decontaminator is set on the peri-implantitis program and the currents are applied, according to pre-set times and methods.

The treatment is painless. The patient is then invited to adopt an adequate home hygiene attitude. The bactericidal action of the current is reported by numerous studies in the literature. Particularly significant are the works of Del PozoJ, L, M.S. Rouse, (1) where there is an effective action of the electric current against the biofilm in culture, consisting of Pseudomonas aeruginosa, staphylococcus aureus and Staphylococcus epidermidis. Sy et all. Other particularly significant works are those of Dreesa (2) on electrochemical inhibition of 2003, and of LEE, Sy et all (3) of 2012. A recent work, currently being published, by Prof. Giammarco Raponi and Dr. Lisa Valentini, of the Department of Public Health and Infectious Diseases of the Sapienza University, highlighted the effectiveness of the **XIMPLANT system**: "In the experimental procedures, a strong bacterial biofilm produced by Enterococcus faecalis from ATCC collection has been layered on the implants that were successively treated in a treatment chamber by electric current produced by the **X-IMPLANT** machine. Evidences are provided that the electric treatment granted by the **X-IMPLANT system** completely removed the bacterial biofilm". Particularly interesting in this method is the prevention of peri-implant infections. The "prevention" protocol provides at the end of a normal scaling session the preventive application on the implant collar in the subgingival prosthesis-implant passage area of the active electrode.

For "Toronto" rehabilitations, the application takes place directly through contact with the passing structure.

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Implant 3D
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Discover our complete solutions for guided surgery such as planning software and surgical guide design software with open system with more than 150 implant manufactures.

Media Lab Inc. is a company which has been present in the market for more than 25 years and **produces software** for the medical and dental industry. Our Implant 3D and GuideDesign software are both **CE and FDA certified.** Media Lab Inc. is present at International fairs such as IDS in Cologne, AEEDC in Dubai, IDEM in Singapore and ExpoDental Meeting in Italy. The international presence of the company coupled with the desire to offer complete solutions for guided surgery such as planning software and surgical guide design software (open system with more than 150 implant manufactures), means we are always looking for reliable partners as distributors. Implant 3D is a software that allows you to perform three-dimensional implant simulation directly on your personal computer. It simulates the positioning of implants on two-dimensional and three-dimensional models, identifying the mandible nerve, tracing panoramics and sections of the bone model, displaying the three-dimensional bone model with the ability to calculate bone density. By using Implant 3D, **the dentist can plan implant-prosthetic surgery** more safely, efficiently and quickly. Implant 3D software allows the **design of a surgical template** for performing implant-prosthetic interventions in guided surgery. Implant 3D allows you to create gums supported, teeth supported, bone supported surgical guides. With a **few clicks** of the mouse you can obtain an extremely precise and customized **surgical guide**. Simply by selecting the edge of the surgical guide and the **type of sleeves** to use, the software **generates the STL file** ready to be printed with a **3D printer**. Advanced features allow you to create inspection holes and add text to better identify the printed template. Implant 3D allows you to export the perforated model for analogs based on the used implant system and the size of the analogs.

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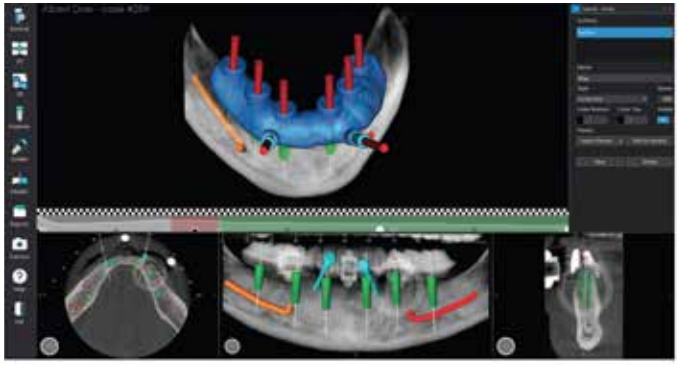

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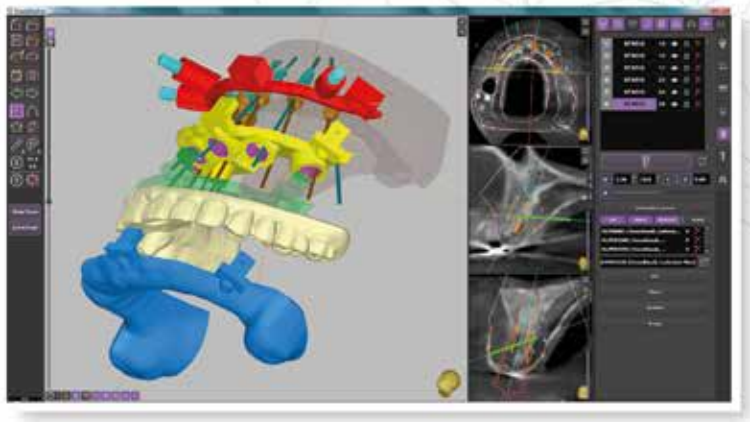

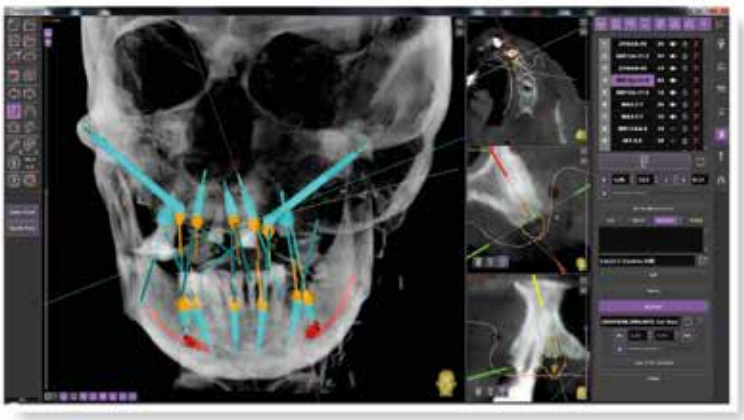

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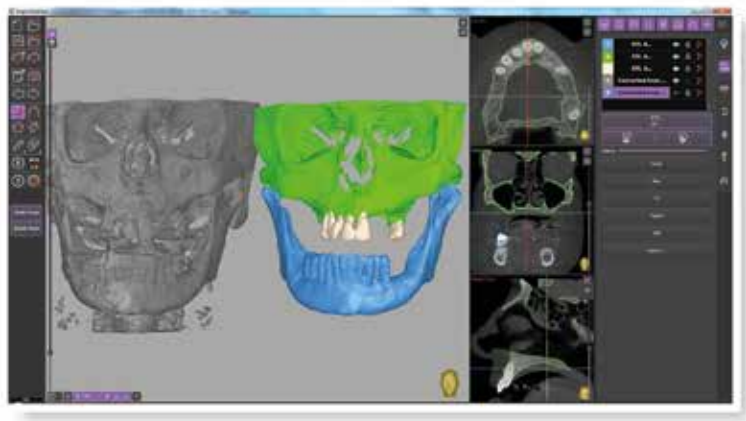

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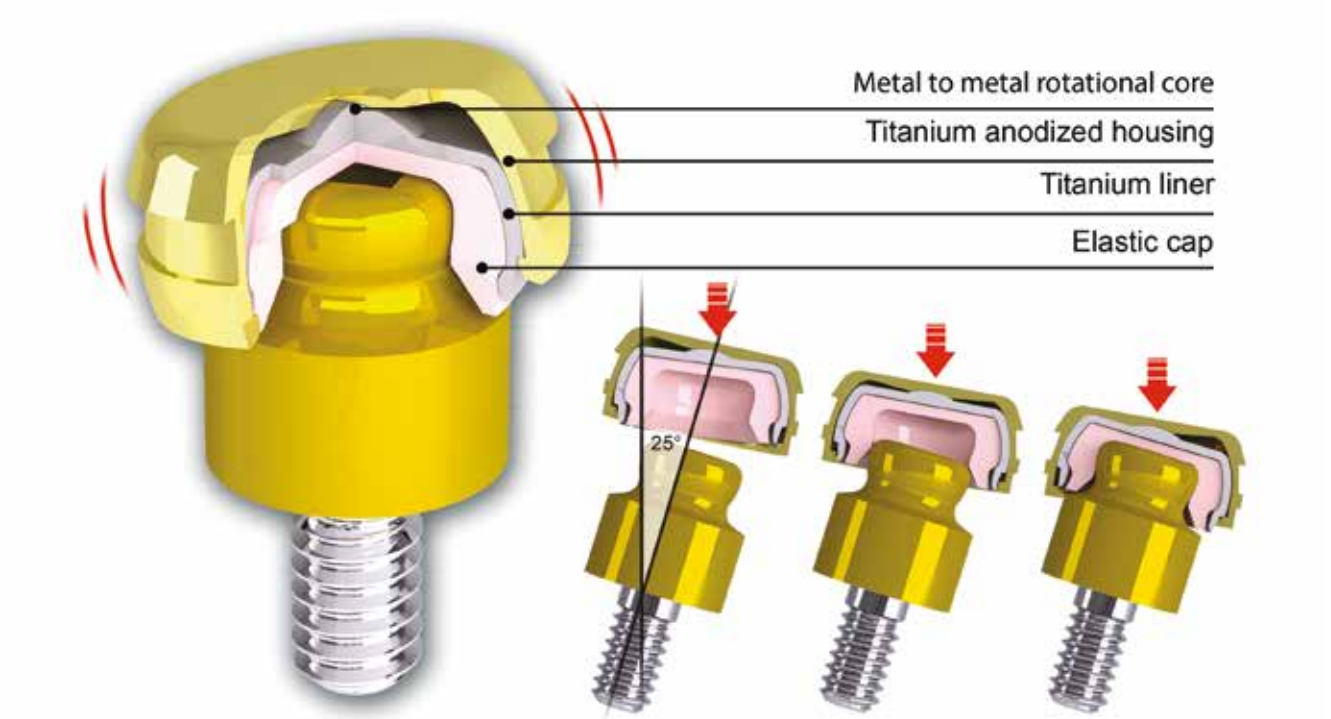

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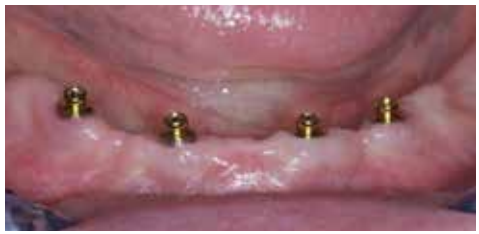
EXPERT OPINION

I have been using Ot Equator attachments (RHEIN 83, Bologna, Italy) for many years. I have performed and published the results of my research on both Locator and OT Equator and have found no differences in clinical and radiographic results, as well as in patients' quality of life. With this in mind, I prefer OT Equator in my daily practice because, by being the smallest attachment available in the market, it allows to obtain a larger space for aesthetics and function.

Dr. Marco Tallarico, DDS, M.Sc. in Oral Surgery
Certificate in Implant Therapy (EAO 2013)
Professor at Department of Surgery, Microsurgery and Medical-Surgical Specialties, University of Sassari, Italy



Dr. G. Rosano

I've been an Ot Equator attachment user for some time. I appreciate the ease of use and versatility of this retentive system. I use it in prosthetic therapy in combination with 2 endosseous implants to improve the stability of the prosthesis. I also use the Ot Equator attachments in combination with a bar and the Seeger system, when I need to simplify the construction of prosthetic artifacts on divergent endosseous implants, both in removable and fixed prosthesis, by using the attachment as a real multi-unit-abutment (MUA).

Dr. Luca Ortensi, Bologna
Professor at the University of Catania

When we talk about removable prosthetics on implants, we are talking about ball attachments. In recent years research has led companies to produce low-profile attachments (such as OT Equator/Locator). Numerous scientific publications have documented that the maintenance levels and problems of ball attachments compared to low-profile attachments with interchangeable nylon inserts are to the advantage of low-profile ones, such as OT Equator. For some time, I have relied almost exclusively on these myself and I believe I already have a several year follow-up that allows me to say that they are extremely reliable.

Prof. Andrea Borracchini, Siena
M.D. D.D.S. Department of Biotechnology
University of Siena,
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OSTEO-CARE PROJECT

Dental prosthetic devices osseointegration improvement by the permeation of autologous growth factors of the implant surface

Release of VEGF from Dental Implant Surface (IML® Implant) Coated with Concentrated Growth Factors (CGF) and the Liquid Phase of CGF (LPCGF): In Vitro Results and Future Expectations

Andrea Palermo [1], Franco Ferrante [2], Eleonora Stanca [3], Fabrizio Damiano [3], Antonio Gnoni [4], Tiziano Batani [5], Maria Annunziata Carluccio [6], Christian Demitri [7] and Luisa Siculella [3],*

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Abstract: This study aimed to evaluate the combined use of the Concentrated Growth Factor (CGF) and the liquid phase of CGF (LPCGF) on dental implant surfaces, using a medical device to determine the migration of growth factors, from the implant surface to the recipient. The implants were permeated by autologous growth factors, using a specific centrifuge device. CGF adhesion on the implant surface was evaluated through a scanning electron microscope analysis. To assess the release of the vascular endothelial growth factor (VEGF) from CGF, LPCGF, and CGF- or LPCGF-permeated implant, an ELISA assay was carried out. The results showed that the concentration of the growth factor VEGF was greater in CGF than in LPCGF. Our innovative technique allowed the incorporation of autologous growth factors on the surface of the dental implants. Moreover, we reported the release of VEGF, over time, by CGF- or LPCGF-permeated implant. On this basis, it was possible to obtain a biologically active implant surface, essential to create intercellular communication and neo-angiogenesis, to facilitate wound healing and tissue regeneration.

Keywords: *bilateral osseointegration; growth factor; dental implant*

1. Introduction

Implant osseointegration is a concept that now enjoys wide support. In 1999, Alberktsson and Zarb defined osseointegration from the clinical standpoint as a rigid and clinically asymptomatic fixation process of an alloplastic material, in bone loaded functionally [1]. The most important aspects for successful osseointegration are the biological characteristics of the host site (the patient) and the macro- and micro-structure of the titanium implant [1,2]. Dental implant surfaces have now achieved outstanding performances, which were previously unimaginable. This ensures an extremely high percentage of osseointegration, even in the most complex situations [3]. However, this meant that the margins for the further improvement of modern surfaces, through mechanical or chemical procedures, are very small. Improvement can be achieved biologically, although, through the addition of autologous growth factors, obtained by processing the patient's venous blood to the implant surface.

The study on tissue reparative processes has highlighted the fundamental role played by platelets (in this context), which are physiological reservoirs of growth factors and proteins. There are various platelet concentrates, such as platelet-rich plasma (PRP), platelet-rich fibrin (PRF), and concentrated growth factor (CGF), which reconstruct bone defects [2]. Numerous studies have shown that PRF provides positive results in tissue engineering [4]. A research by Sohn et al. has demonstrated the greater regeneration capacity of the CGF and its multi-purpose use [5]. After a long phase of study, our therapeutic choice was the use of the CGF, for the following reasons. It is 100% autologous and biocompatible, requires a simple preparation, is easily identifiable, has a very high concentration of platelets in a fibrin network, has a presence of growth factors and no manipulation of the product is necessary when exclusively using autologous blood products, without the addition of other substances. Platelets, in particular, contain biologically active proteins at high concentrations and support cell healing, growth, and morphogenesis [6]. In addition to platelets, CGF contains fibroblasts, leukocytes, and endothelial cells for angiogenesis and tissue remodeling; and provides a matrix for cell migration [7,8]. CGF is a fibrin biomaterial rich in the growth factors obtained by centrifugation of venous blood, at alternating speeds, as set on the Silfradent device [8].

CGF, associated with guided bone regeneration, has been used to accelerate new bone formation. Due to its special characteristics, including lack of immune reaction, capability of accelerating tissue healing and vascularization, and anti-swelling properties, CGF is widely used in implant surgery [9–11]. However, the interaction between CGF and dental implant is not clear. The addition of autologous growth factors to the implant surface is hindered by titanium's characteristics of extremely low wettability [12]. This means that to simply wet the implant with autologous growth factors is of little use, unless it is left in immersion for more than 30 min [13]. This makes the procedure difficult to include in the clinical routine. In view of these difficulties, the challenge of producing a biologically active surface still remains. The present study reports a protocol that could produce a biologically active implant surface. The growth factors are incorporated onto the implant surface, using a dedicated implant ampoule, which enables the procedure to be carried out in a closed field. A centrifuge device (Round up) made by a Silfradent related to the ampoule enables autologous fibrin and growth factors to be incorporated onto the implant surface, within five seconds. We verified the adhesion of CGF on the titanium implant surface and then quantified the release of the vascular endothelial growth factor (VEGF) from CGF, the liquid phase of CGF (LPCGF), and CGF- or LPCGF-permeated implants.

2. Materials and Methods 2.1.

Preparation of CGF and LPCGF Blood samples (8 mL) were taken by puncture of a vein from five donor patients, non-smokers, and those in good general health. The five donors involved in the study (three men and two women) were aged between 25 and 45 years, with a BMI (Body Mass Index) between 21 and 23 points. The remote and pathological anamnesis were negative. Patients were not on therapy with any type of drug and the blood samples were taken separate from the main meals, on empty stomach. Informed consent was obtained from the patients included in this study. Tubes of blood were processed by a device (Medifuge MF200; Silfradent srl, Forlì, Italy) to obtain CGF, following the manufacturer's instructions. The resulting CGF was then inserted into dedicated implant ampoules (Figure 1), so that the coating procedure could be carried out in a closed field; each contained an implant (Immediateload®, Swiss dental implants, diameter 4 mm and height 8 mm). To incorporate the CGF onto the implant surface, these tubes were inserted into a second device, Round Up (Silfradent srl, Forlì, Italy), and centrifuged for 5 seconds, following the manufacturer's instructions (Figure 2).

Evaluation of the quality of the CGF was done on two fractions—the so-called white fraction and the red fraction.

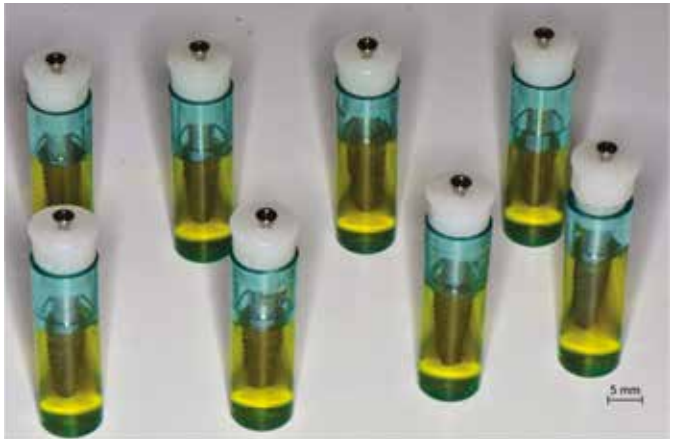

Figure 1. Concentrated Growth Factor (CGF) isolation after using the Silfradent device (Medifuge MF200; Silfradent srl, Forlì, Italy).

Figure 2. Centrifugation of the test tubes with Immediateload implants along with CGF or the Liquid Phase of CGF (LPCGF) by Round Up (Silfradent srl, Forlì, Italy).

The white cup-tubes allowed the obtainment of a fraction, known as LPCGF (liquid phase of CGF), that comprised non-polymerized liquid fibrin. It was isolated by placing the centrifuged blood in a test tube, with a white lid; this was completely smooth within and contained no additives. It produced the material in a liquid state; this would polymerize at room temperature (RT), over the subsequent 15 min. The red cup-tubes allowed the obtainment of a fraction, known as CGF polymerized fibrin, which was isolated using a test tube with a red lid and textured inner walls, to promote polymerization, through an exclusively physical process. The resulting fraction had a thicker consistency than the fraction obtained by the white cup-tube, a gelatinous appearance, and a higher cell concentration of the non-polymerized fibrin.

2.2. SEM Analysis

The CGF-permeated implant was fixed in 2.5% glutaraldehyde for 2 h at RT. The specimen was fixed with 1% osmium tetroxide for ~2–4 h, and then dehydrated with a graded ethanol series (from 50% to 100%, in steps of about 20%, for 10 min each). After dehydration, the SEM preparation procedure was completed by critically drying the material. The analysis was performed by means of ZEISS EVO 40 (Carl Zeiss, Milano, Italy)) in a low vacuum modality and by applying a voltage of 25 kV. The sample was placed on the SEM sample holder, using double-sided adhesive tape, and was observed without any further manipulation, at a lower and higher magnification (50× and 1000×) [14].

2.3. ELISA Assay

LPCGF (white fraction) and CGF (red fraction), or implants plus CGF/LPCGF, immediately after the preparation, were transferred to the wells containing phosphate buffer saline (PBS, Sigma Aldrich, Milan, Italy). The supernatants were collected at time 0, and after 1, 2, and 3 days. VEGF concentrations in the media were determined by using ELISA and following the manufacturer's protocols (R&D Systems, Minneapolis, MN, USA). In brief, 100 µl of the culture supernatant was added to each ELISA well, pre-coated with anti-human VEGF polyclonal antibody. After 2 h of incubation at room temperature, the plate was washed and 100 µl of human VEGF conjugate was added to each well. The plate was incubated at RT for 1 h, washed again, and 100 µl of the substrate solution was added to each well. The plate was then incubated at RT, in the dark, for color development. After 30 min, 100 µl of stop solution was added to each well. Absorbance in each well was measured by using a microplate reader at 450 nm. The concentration of VEGF in the culture supernatant was determined through interpolation from the standard curve.

2.4. Statistical Analysis

Data were expressed as mean ±SD. Statistical analysis was determined by paired Student's t-test. In all comparisons, $p < 0.05$ was considered as statistically significant.

3. Results and Discussion

CGF is constituted by a fibrin network that includes many cellular components, such as stem cells and growth factors [8,15]. The CGF exerted its effects through the degranulation of the platelet granules, which contained various growth factors that are considered important in the initial phase of wound healing. This resulted in an increase in cell proliferation and differentiation, matrix formation, osteoid tissue production, connective tissue formation, angiogenesis, and collagen synthesis. The degranulation process began immediately after platelet aggregation and lasted about
7–8 days. This affected the macrophage cells that continued the repair process. The wound healing rate was directly proportional to the quality of platelet concentration in the clot, inside the graft. In the present study, we obtained two different concentrated growth factors, named CGF and LPCGF, and we analyzed the release of the growth factor VEGF, from both preparations incubated
in PBS, for up to three days, as shown in Figure 3. The results showed that both preparations of CGF and LPCGF released VEGF, the concentration of VEGF was higher in CGF than in LPCGF, by about five times, at time 0 (Figure 3).
However, the VEGF release from the CGF drastically decreased by about 78% and 93%, after the first and second day, respectively, compared with time 0 (Figure 3). The VEGF release was also reduced in LPCGF by about 43% after the first day, and was further lowered on the second day, reaching levels comparable to the VEGF release from the CGF (Figure 3). Our results expand on the previous findings regarding the release of VEGF by CGF [15].

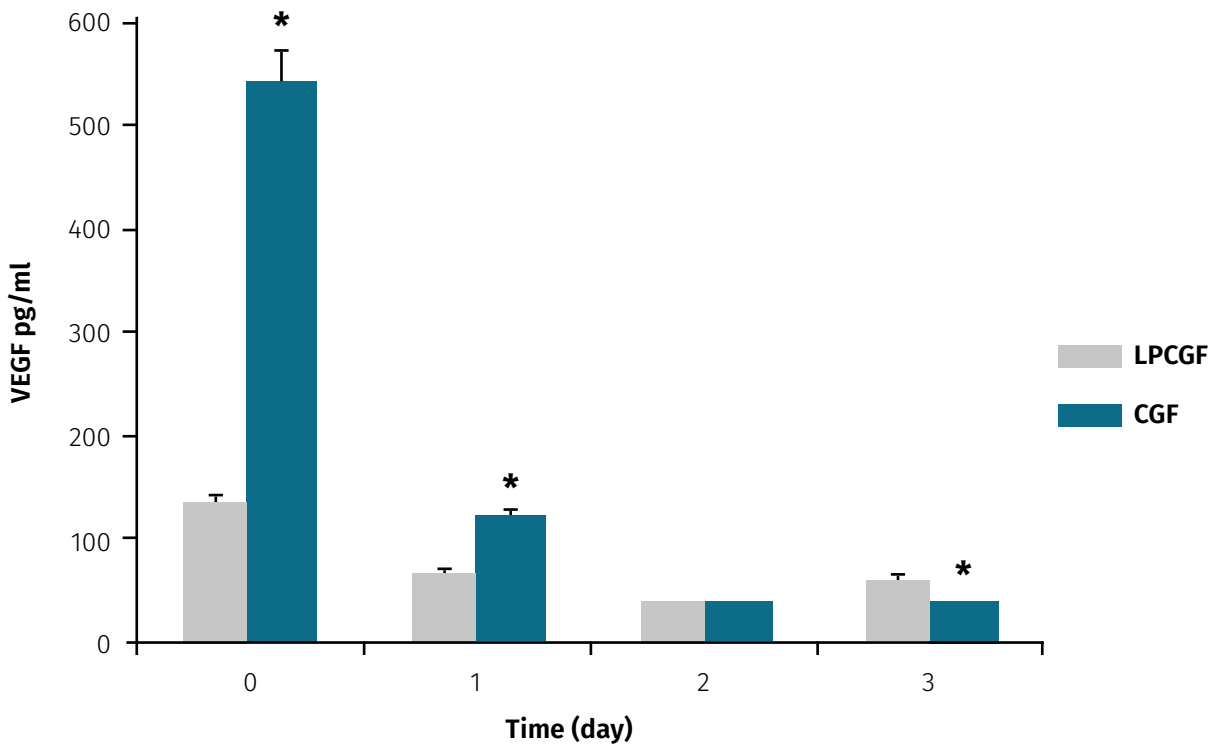

Figure 3. ELISA quantification of human vascular endothelial growth factor (VEGF) into phosphate buffer saline (PBS) from CGF and LPCGF at various times (0–3 days). Values are means ± SD, n = 3. *p < 0.05 denotes the statistically significant differences between VEGF released by CGF or LPCGF.

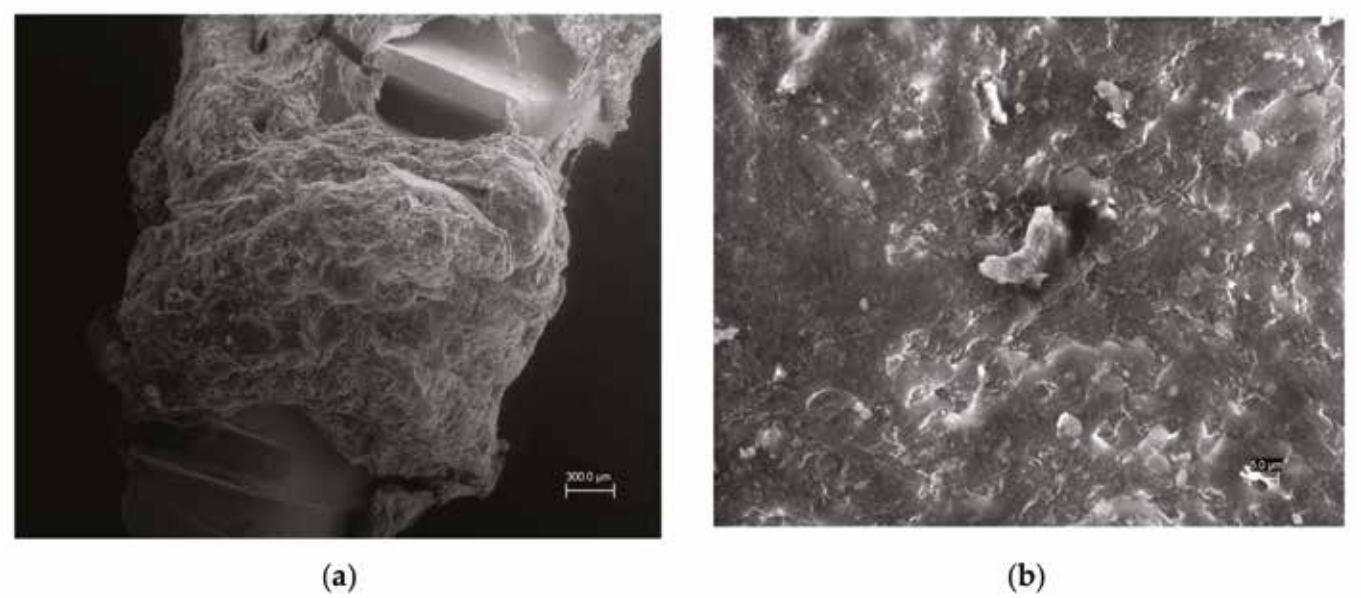

Figure 4. (a) SEM photomicrograph of the CGF-permeated implant. (b) Large magnified image of the CGF-permeated implant detail.

By using an innovative device, we evaluated the potential incorporation of CGF on the surface of the titanium implant. We verified the interaction between the CGF and the titanium implant surface, by SEM analysis, revealing that the CGF actually permeated the surface of the implant (Figure 4). Having shown that, in our experimental conditions the CGF was able to adhere to the implanted surface forming a fibrin network, we evaluated whether the CGF-permeated implant also allowed the release of growth factors, in particular VEGF, from the implant towards the medium—PBS.

As shown in Figure 5, the implants permeated with CGF or LPCGF were able to release VEGF in PBS medium. At time 0, in the permeated implant, as well as in the system without implants, the concentration of VEGF was five times higher in CGF than in LPCGF. However, contrary to the CGF or LPCGF without implants, VEGF released from the CGF or the LPCGF-permeated implant, increased on time. In particular, the VEGF levels from the LPCGF-permeated implant increased in a time-dependent manner, until the second day and then remained constant.

The time course in Figure 5 also shows that the VEGF released from the CGF-permeated implant was significantly raised on the first day, by about 70%, remained almost constant on the second day, and was then lowered by about 15% on the third day (Figure 5). To the best of our knowledge, our study provided, for the first time, results concerning the incorporation of autologous growth factors on dental implants, and the associated release of VEGF over time. It is important to emphasize that the use of specific implants was crucial for a better implant micro-surface that enabled the growth factors to settle on the inner surface. The surface of the Immediateload implant was

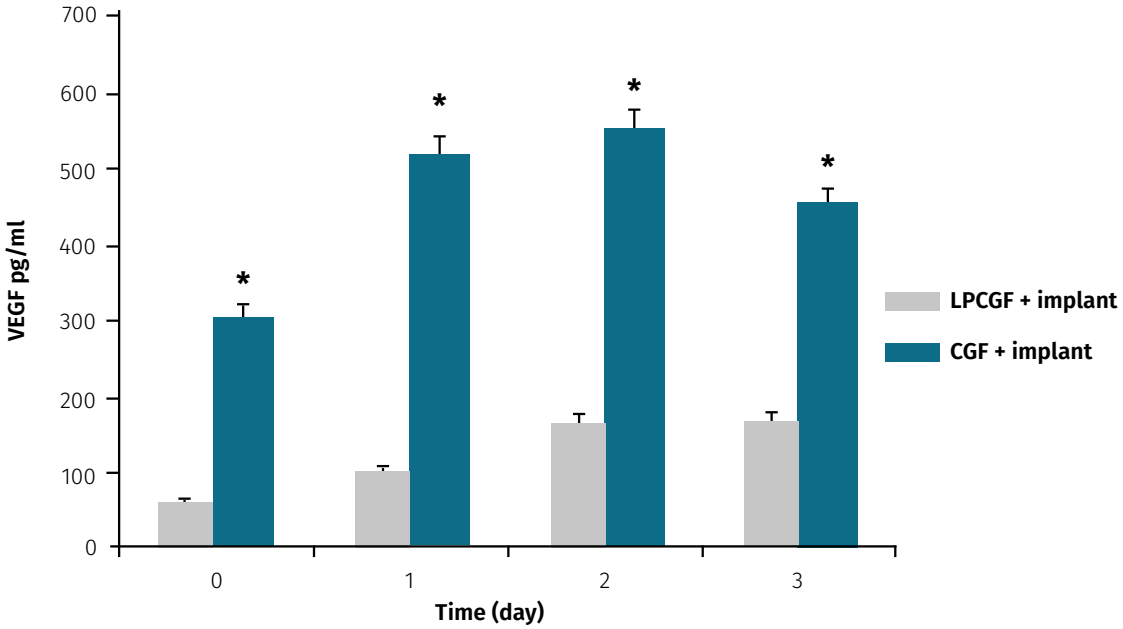

Figure 5. ELISA quantification of human VEGF into PBS from CGF- and LPCGF-permeated implants at various times (0–3 days). Values are means ± SD, n = 3. *p < 0.05 denotes statistically significant differences between the VEGF released by CGF- and LPCGF-permeated implants.

specifically designed to be coated by the patient's CGF, while presenting excellent characteristics of osseointegration, in the absence of CGF. From a practical standpoint, a coating with LPCGF could be achieved through a closed system created for the direct addition of LPCGF, within the implant tube, using needles. The procedure is easily reproducible in an outpatient setting, thanks to the dedicated implant tubes. However, when using CGF, although its concentration of VEGF at time zero was much higher than that in LPCGF, it entailed the opening of the tube for inserting the CGF, and its closure, before centrifugation. However, this last procedure (the opening of the tube and the addition of the CGF) took place in an open system, but with a contiguity of time and space that did not limit its clinical application. From a clinical point of view, it would be very important and interesting to evaluate if a slow and gradual release of VEGF by LPCG, over time, would be more effective, than a quick release of VEGF by CGF. In fact, the presence of VEGF on the implant surface was crucial, since this growth factor could improve the osseointegration of the dental implant [16].
Incorporation of the CGF/ LPCGF on the surface of the titanium implant could be carried out in private practice, but always according to the national laws of a country, which might be different from one country to another. The organization should first obtain all necessary authorizations for medical and surgical practice.

4. Conclusions

The results reported here showed that a titanium dental implant surface, permeated with CGF or LPCGF, contained fibrin, which is fundamental to accommodate the cellular network. The permeated dental implant surface was found to slowly release VEGF, a growth factor indispensable in creating inter-

cellular communication and neo-angiogenesis, during bone regeneration and healing [17–19]. The devices used in this study could be employed to produce the first biologically active implant surface, permeated with both fibrin (which is essential to accommodate the cellular network) and growth factors (which are essential to create intercellular communication and neo-angiogenesis).
By using this procedure, the osseointegration process becomes bilateral, operating both from the bone towards the implant, and from the implant towards the bone. This could reduce healing time and potentiate the physiological response. It will, thus, become possible to expand the application of this type of surface in other fields of medicine, including orthopedics, maxillofacial surgery, and plastic surgery. Further studies are needed to investigate the use of biologically active surfaces, in greater depth, and to further improve the implant micro-surfaces, making them increasingly permeated by the autologous growth factors.

This innovative project is focused on all zirconium-titanium implants an on all implant brands.

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MEDIFUGE-CGF

Author Contributions: Conceptualization, A.P., L.S., M.A.C., and T.B.; methodology, A.G., C.D., F.D., F.F., and E.S.; validation, A.P., F.F., E.S., and L.S.; investigation, A.G., C.D., F.D., F.F., and E.S.; resources, E.S.; writing—original draft preparation, E.S. and F.F.; writing—review and editing, A.P., F.F., E.S., M.A.C., and L.S.; supervision, A.P. and L.S.; project administration, L.S.; funding acquisition, A.P., L.S., and T.B.

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Conflicts of Interest: The authors state that this article does not engender any conflicts of interest, whatsoever, with any organization or individual.

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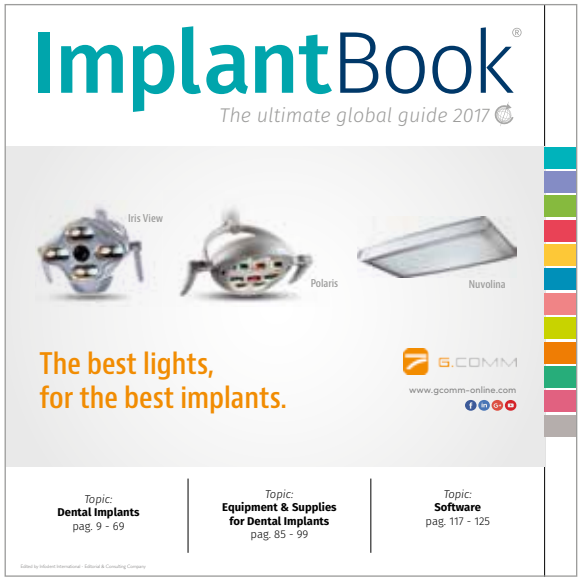

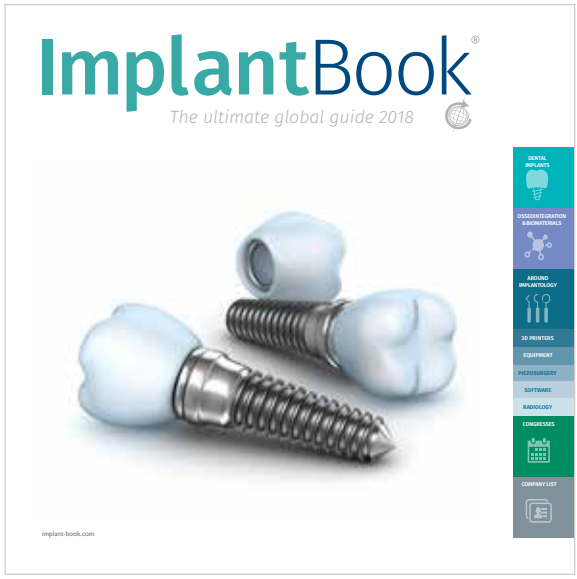

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