October 2, 2020

RevisiOs BV
% Kathy Remsen
Principal Consultant
MRC Global
9085 East Mineral Circle, Suite 110
Centennial, Colorado 80112

Re: K201546
Trade/Device Name: OsOpia Synthetic Bone Void Filler
Regulation Number: 21 CFR 872.3930
Regulation Name: Bone Grafting Material
Regulatory Class: Class II
Product Code: LYC
Dated: July 14, 2020
Received: July 15, 2020

Dear Kathy Remsen:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database located at https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm identifies combination product submissions. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803) for devices or postmarketing safety reporting (21 CFR 4, Subpart B) for combination products (see https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance) and CDRH Learn (https://www.fda.gov/training-and-continuing-education/cdrh-learn). Additionally, you may contact the Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/contact-us-division-industry-and-consumer-education-dice) for more information or contact DICE by email (DICE@fda.hhs.gov) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

for Srinivas Nandkumar, Ph.D.
Director
DHT1B: Division of Dental Devices
OHT1: Office of Ophthalmic, Anesthesia, Respiratory, ENT and Dental Devices
Office of Product Evaluation and Quality
Center for Devices and Radiological Health

Enclosure

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration

Indications for Use

Form Approved: OMB No. 0910-0120
Expiration Date: 06/30/2020
See PRA Statement below.

510(k) Number *(if known)*
K201546

Device Name
OsOpia Synthetic Bone Void Filler

Indications for Use *(Describe)*
OsOpia is a bone grafting material indicated for use in the specific treatment of extraction sockets and maxillary sinus augmentation procedures.

Type of Use *(Select one or both, as applicable)*

☒ Prescription Use (Part 21 CFR 801 Subpart D) ☐ Over-The-Counter Use (21 CFR 801 Subpart C)

CONTINUE ON A SEPARATE PAGE IF NEEDED.

This section applies only to requirements of the Paperwork Reduction Act of 1995.

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510(k) Summary

OsOpia Synthetic Bone Void Filler

October 1, 2020

Company: RevisiOs BV
Professor Bronkhorstlaan 10, building 48
3723 MB Bilthoven
The Netherlands

Primary Contact: Kathy Remsen
Phone: 901-606-4856

Company Contact: Hen Baron
+31-30-740450
hen.baron@kurosbio.com

Trade Name: OsOpia Synthetic Bone Void Filler

Common Name: Bone Grafting Material, Synthetic

Classification: II

Regulation Number: 872.3930

Panel: Dental

Product Code(s): LYC

Device Description:

OsOpia is a synthetic, > 90% TCP (Tri-Calcium Phosphate - $Ca_3(PO_4)_2$) and < 10% Hydroxyapatite ($Ca_{10}(PO_4)_6(OH)_2$) resorbable micro-structured bone grafting material for the repair of bony defects. OsOpia induces and guides the three-dimensional regeneration of bone in the defect site into which it is implanted. Rigid fixation techniques are recommended as needed to assure stabilization of the defect in all planes (e.g. bioresorbable or non-resorbable barrier membranes). When placed next to viable host bone, new bone will be deposited on the surface of the implant. The implant resorbs and is replaced by bone during the natural process of bone remodelling.

OsOpia is gamma sterilized, comes in several sizes in granular form, and is double sterile packaged for single use only.

Indications for Use: OsOpia is a bone grafting material indicated for use in the specific treatment of extraction sockets and maxillary sinus augmentation procedures.

Substantial Equivalence: OsOpia was demonstrated to be substantially equivalent in indications and design characteristics to the following devices previously cleared by the FDA.

Primary Predicate:

- OsSatura™ Dental, IsoTis Orthobiologics Inc (K042706)

Reference Devices:

- CuriOs™, Progentix Orthobiology BV (K090641)
- MagnetOs, Xpand Biotechnology BV (K161859)

Device Type	**SUBJECT DEVICE**	**PRIMARY PREDICATE**	**REFERENCE DEVICE**	**REFERENCE DEVICE**
Name	**OsOpia Synthetic Bone Void Filler**	**OsSatura™ Dental**	**CuriOs™**	**MagnetOs**
Manufacturer	RevisiOs B.V.	IsoTis Orthobiologics Inc	Progentix Orthobiology B.V.	Xpand Biotechnology B.V.
510(k) Clearance	Subject Device	K042706	K090641	K161859
Intended Use				
Indication	-Extraction socket -Sinus augmentation	-Root resection, apicoectomy and cystectomy -Extraction sockets to enhance preservation of the alveolar ridge, -Elevation of maxillary sinus floor -Treatment of periodontal defects.	Orthopedic (posterolateral spine as graft extender and pelvis)	Orthopedic (posterolateral spine as graft extender)
Product Code	LYC	LYC	MQV	MQV
Composition				
Calcium salts	β- TCP >90% HA <10%	β- TCP: 20% HA: 80%	β- TCP >90% HA <10%	β-TCP 65-75%; HA 25-35 %
Physical Properties				
Form	Irregularly shaped granules			
Granule Size	250-1000 µm	200-2000 µm	150-500 µm, 500-1000 µm, 1-2 mm,1-4 mm	150-500 µm, 250-1000µm, 500-1000 µm, 1-2 mm, 2-4 mm
Package Sizes	0.5-5cc	Not Available	0.5-20cc	0.5-20cc
Other Properties				
Biocompatibility	Biocompatible per ISO 10993-1			
Single use	Yes			
Sterilization	Gamma Irradiation			

While the Indications for Use statements differ for the proposed and predicate devices, they share the same intended use as a bone grafting material to fill various types of bone defects. The proposed indications for OsOpia are narrower than the primary predicate; therefore, there are no new questions of safety or effectiveness raised by the OsOpia indications. The main difference between OsOpia and the primary predicate is the ratio of β-TCP to HA. However, a reference device is provided with the same β-TCP/HA ratio as OsOpia. The granule size range also differs between OsOpia and the primary predicate; however, the OsOpia granule size range is within the range of the predicate. Because the OsOpia granule size range is narrower than the predicate, there are no new issues of safety or effectiveness due to this difference.

Biocompatibility Testing

The biocompatibility of the device was assessed using the methodology described in ISO 10993-1 and FDA Guidance, "Use of International Standard ISO 10993-1, Biological Evaluation of medical devices – Part 1: Evaluation and testing within a risk management process." Evaluation included ISO 10993-3, ISO 10993-5, ISO 10993-6, ISO 10993-9, ISO 10993-10 and ISO 10993-11.

Sterilization Validation

The sterilization of OsOpia using gamma irradiation was validated in accordance with ISO 11137-1 and ISO 11137-2 to a sterility assurance level of 10^{-6}.

Shelf Life

The shelf life of OsOpia was assigned based on accelerated and real time aging studies of both the packaging and the product. The packaging was tested using burst test (ASTM F1140), peel test (ASTM F88), and gross leak test (ASTM F2096). The product stability was assessed by monitoring color, XRD, SEM, and porosity.

Bioburden/Pyrogenicity

Verification batches of OsOpia met specifications for bioburden and pyrogenicity. Bacterial endotoxin testing was performed in accordance with USP<85> using the limulus amebocyte lysate (LAL) method and showed that the device meets the endotoxin limits of established FDA guidelines.

Bench testing

Material characterization was performed in accordance with ASTM F1088 and ASTM F1185 and included the following:

- chemical composition was analyzed by x-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FTIR)
- trace elemental analysis was performed by inductively coupled plasma/mass spectroscopy (ICP/MS),
- dissolution was performed to evaluate the in vitro calcium release rate, and
- porosity was measured by mercury intrusion porosimetry.

The analytical characterization demonstrated equivalent chemical composition, physical properties and performance characteristics for the subject OsOpia and predicate/reference devices.

Animal Studies

The performance of OsOpia was evaluated in a sheep model for an intraoral maxillary sinus floor augmentation surgery. The results of the study demonstrated that the performance of the subject device was suitable as a bone grafting material for maxillary sinus augmentation.

Clinical Data

Six clinical studies using OsOpia in adult patients were used to support the substantial equivalence. All of the studies were prospective studies. One study was randomized. The other studies were single-arm. Overall, 90 patients were evaluated. No serious adverse events were reported for OsOpia. Two studies evaluated bone histology at 5-6 months post implantation with OsOpia demonstrating equal or greater new bone formation than the control. Four of the studies evaluated implant placement survival. The implant survival rate was ≥96% in the clinical studies. The human studies demonstrate the performance of OsOpia for socket extraction and maxillary sinus augmentation indications.

Conclusion

Based on pre-clinical and clinical data, the bench testing results and the comparison to the predicate and reference devices, the subject device is determined to be substantially equivalent to the predicate device.