

HUDENS BIO

Research innovation, technological revolution





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01

Company Overview

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About HUDENS BIO

01

HUDENS BIO is a R&D based manufacturer with innovative technology.

HUDENS BIO

Company Name	HUDENS BIO Co., Ltd.
Established Date	April 16, 2013
CEO	Hak Noh
Location	249, Chuam-ro, Buk-gu, Gwangju
Major Product	Dental bur, Resin, and Bone Graft Material
Number of Employees	38



Overview of Founder

Chairman, Hak Noh, the founder of Hudens BIO, obtained his doctorate from the Department of Material Engineering in the University of Vermont and is leading the innovation of manufacturing technology.

“We offer you a **Promising Result** based on advanced technology and extensive experience”

Material Engineering

Department of Material Engineering,
University of Vermont (Ph. D.)

Experience

(Present) Expert Advisor, New Health Technology Assessment (2012-)

(Present) Project Director, Korea Dental Industry Association (2011-)

(Present) Expert Advisor, ISO TC106 Dental Equipment (2001-)

Technical Director, Alpha Dent (1998-2011)

Adjunct Professor, College of Dentistry, Yonsei University (1998-)

Full-time Researcher, KAIST Energy Environment Research Center (1997-1998)

Commerce Doctor for Jeollanam-do Small and Medium Business
Export Advisory Committee

Researcher at McGill University Material Research Center, Canada

Researcher, University of Vermont, USA

27 SCI theses (Lead Author: 13 , Co-author: 14)



HUDENS BIO Business Overview

01

The core of medical industry is "Material" itself. Our continuous Research and Development to become the Global Medical Material Expert is still ongoing. Through 3rd generation material components, continuous investments in human resource and technology will enable Hudens BIO to soon "LEAD" the market.



Research : R&D

Quality : QC / QA Guaranteed



Product : OCP Product Sale

Octacalcium Phosphate



Extended Sales : Current Products

Extending Sales Channel



Future Developments

3D Printer, Cements, etc

History

02

HUDENS BIO was found in 2013 and has gained its reputation for the technological strength from various organizations.

HUDENS

2013~2014

2013.12
Acquire Medical Equipment
Manufacture License

2014.03
Establishment of affiliated
research center

2015~2017

2015.01
Beginning of intensive development
of dental resin products

2016.03
Expansion of dental resin products
(seven items)

2017.12
Establishment of a joint venture with
Huaguang, China's top dental
equipment dealer

2018

2018.06
Establishment of HUDENS BIO China

2018.10
Conclusion of MOU with Italy's
REDDISH STONE for collaboration

2018.10
Venture company certificate

2019~2020

2019.07
Application for patent for synthetic bone graft material manufacturing equipment

2019.08
Selected for IP Start-up Road Day by Korean Intellectual Property Office

2019.09
Completion of test and evaluation for the safety of synthetic bone graft material

2019.11
Completion of test and evaluation for the validity of synthetic bone graft material

2019.12
Commencement of the construction of HUDENS BIO production plant

2020.01
Designation as the Promising Small and Medium Exporter

2020.04
Reception of 2020 Grand Prize for Technological Innovation at Korea Industry Awards

2020.05
Reception of Global IP Star Company Certificate

02

Products

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Major Products

HUDENS BIO has the core technology for manufacturing and offers products that are localized for the first time in Korea.

01



Burstar - HP / Burstar - FG

Used to remove existing filler and prosthetic material, **only produced by HUDENS BIO in Korea**

Market scale: About 17M USD
(Target : About 8M USD)

02



Burstar - D

Used for tooth preparation, cutting restoration, and indentation

Market scale: About 17M USD
(Target: About 8M USD)

03



EZ - Tempo

A material used temporarily to protect prepared tooth and maintain aesthetic appearance, **Localized by HUDENS BIO for the first time in Korea**

Market scale: About 8M USD
(Target: About 4M USD)

04



EZ - Soft

Localized by HUDENS BIO for the first time in Korea, gives the buffering effect between denture and gum to distribute the occlusal force evenly to reduce pain

Market scale: About 8M USD
(Target: About 4M USD)

Major Products

HUDENS BIO has the core technology for manufacturing and offers products that are localized for the first time in Korea.

05



EZ - Pattern

Used for making patterns such as the supportive connection for implanted prosthetic material, **successfully localized by HUDENS BIO for the first time in Korea**

06



EZ - Orthopia

used for making removable appliance such as activator and retainer, **localized by HUDENS BIO for the first time in Korea**

07



Ceramax, Zimax

Applied to metal or zirconia frame to make dental implant, **localized by HUDENS BIO for the first time in Korea**

Market scale: 24M USD
(Target: 8M USD)

08



7 Types including GN-780

Rare metal alloy used for making in-lay, on-lay, and crown bridge

Market scale: 24M USD
(Target: 8M USD)

Future Releases

HUDENS BIO is continuously launching various product pipelines to further influence the market consistently.

Dental Handpiece



A device running on air pressure, used with drill, bur, etc. to prepare tooth in dental clinic

Market Scale: About 8M USD
(Target: About 4M USD)

Endodontic File



A device used for denervation during endodontic treatment, has excellent elasticity and fatigue strength

Market Scale: About 33M USD
(Target: About 8M USD)

Temporary Cement



Non-eugenol-based cement used to adhere to temporary teeth. It can also be used to patients having allergic response

Market Scale: About 33M USD
(Target: About 8M USD)

Orthodontic Cement



Resin type cement used to adhere the orthodontic bracket to teeth surface

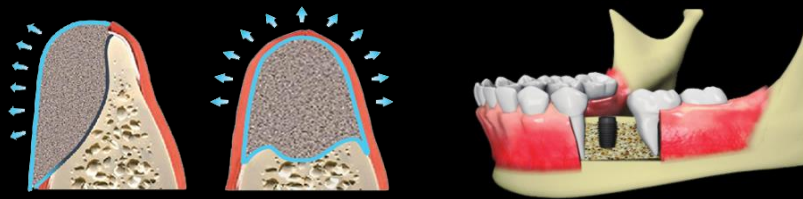
Market Scale: About 33M USD
(Target: About 8M USD)

Mainstream R&D Product (Synthetic Bone Graft Material)

HUDENS BIO's Bone Graft will transform the current bone grafting market.

What is Bone Graft Material?

It refers to the material used to reconstruct the alveolar bone which plays an important role for implant treatment.



Synthetic Bone Graft Material in Current Market

The graft materials currently used in the market such as autogenous bone, allogeneic bone, and heterogenous bone have various adverse effects and become huge financial burden, and thereby requiring a new synthetic bone graft material.



Autograft Bone

Surgery and Financial Burden



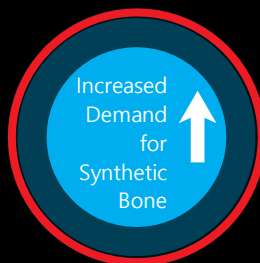
Allograft Bone

Possibility of immune-rejection



Xenograft Bone

Possibility of Causing Disease



Advantages of HUDENS BIO

HUDENS BIO developed synthetic graft material that is economically less burdening, has no immune-rejection, and has no potential of causing disease.

#Price Competitiveness

#Stability

#Biocompatibility

#Convenient Operation

#Porosity

#Mass Production

#Closest To Our Bone

#Fast Integration



New R&D Product (Synthetic Bone Graft Materials)

Successful development of innovative material in all aspects from quality to price, and effect.

Major Materials for Synthetic Bone Graft Materials by Generation

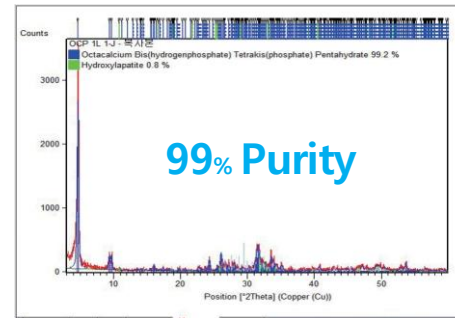
Division	1st Generation	2nd Generation	3rd Generation	4th Generation
Material	Al_2O_3	HA, HA-coated	TCP, BCP, bioglass	OCP, Low T CaPs

HA $Ca_5(OH)(PO_4)_3$

TCP $Ca_3(PO_4)_2$

OCP Octacalcium Phosphate
 $Ca_8H_2(PO_4)_6 \cdot 5H_2O$

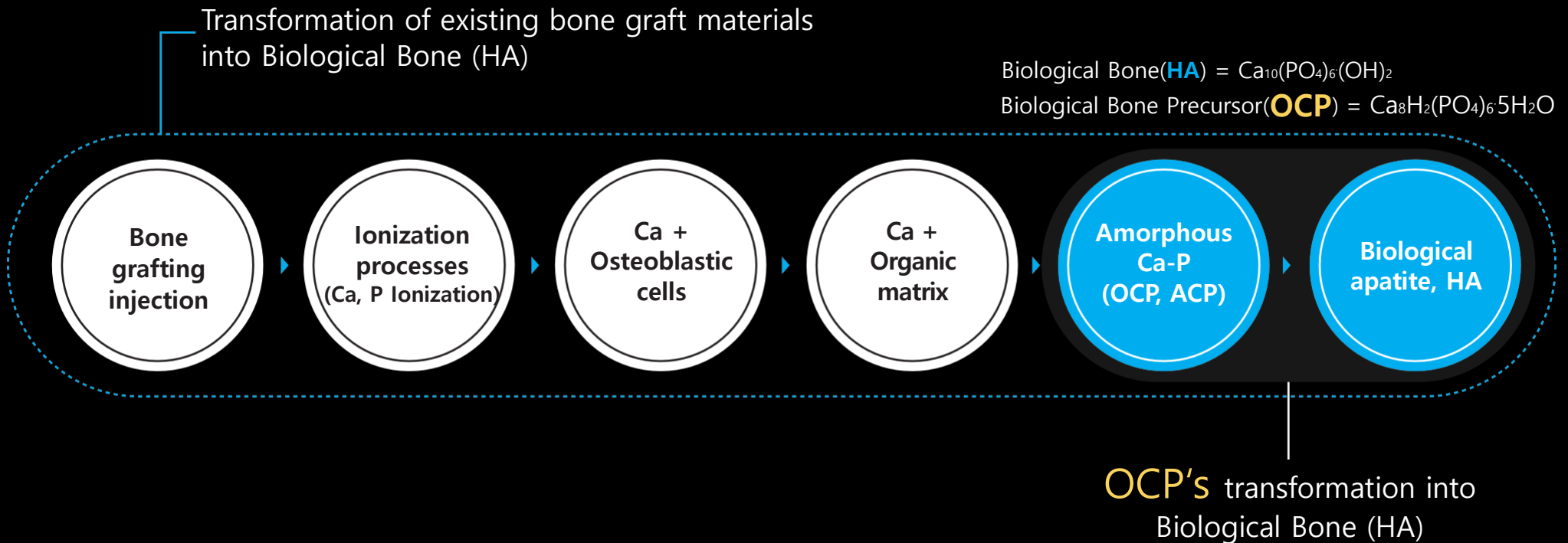
Octacalcium Phosphate



New R&D Product (Characteristics of Synthetic Bone Graft Materials)

HUDENS BIO's OCP is low-crystalline material (remedying the shortcomings of high-crystalline materials) that displays excellent osteoplastic and osteo-induction performances, and high osteo-conduction.

This synthetic OCP bone graft material transforms into the biological hydroxy apatite (HA) twice or three times faster than existing materials.



Discussions Related to the Development of Synthetic Bone Graft Material Product

05

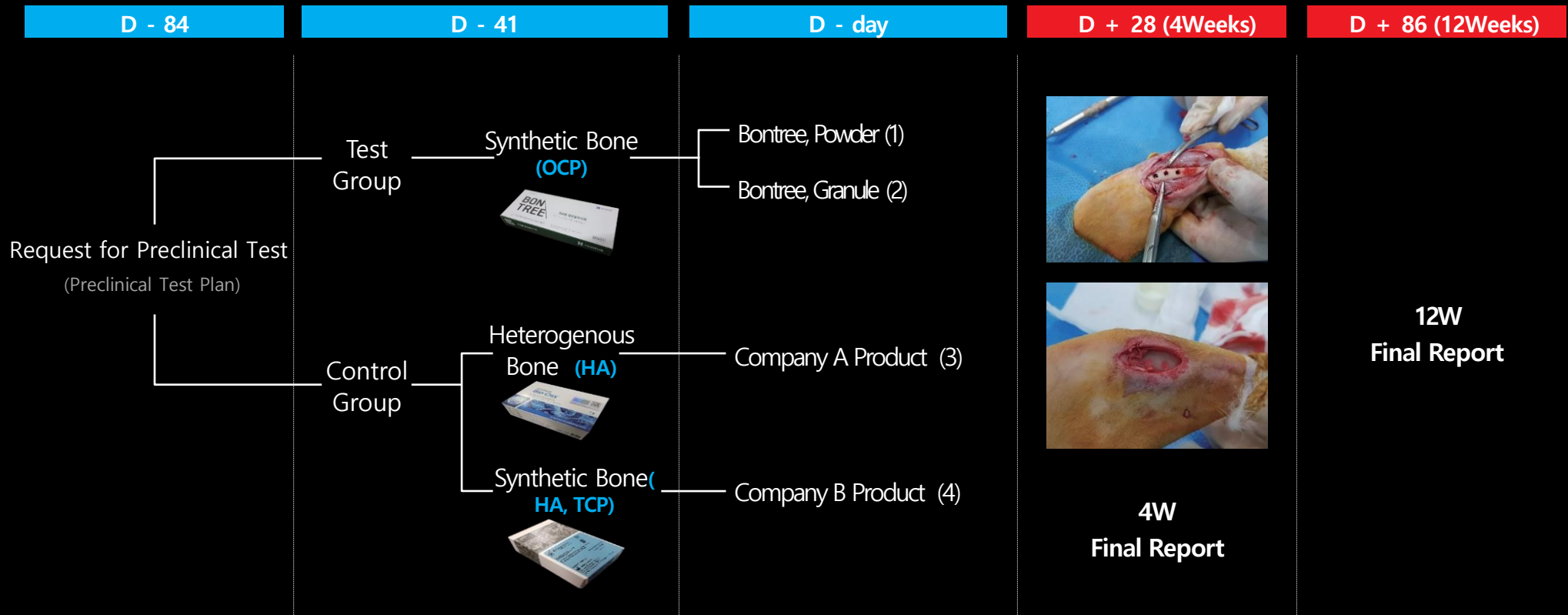
—
HUDENS BIO is following the market through continuous communication and development with field experts.



Synthetic Bone Graft Material Pre-Clinical Evaluation (4W, 12W Trials)

HUDENS BIO's synthetic bone graft material's biological validity was evaluated over the periods of four weeks and twelve weeks.

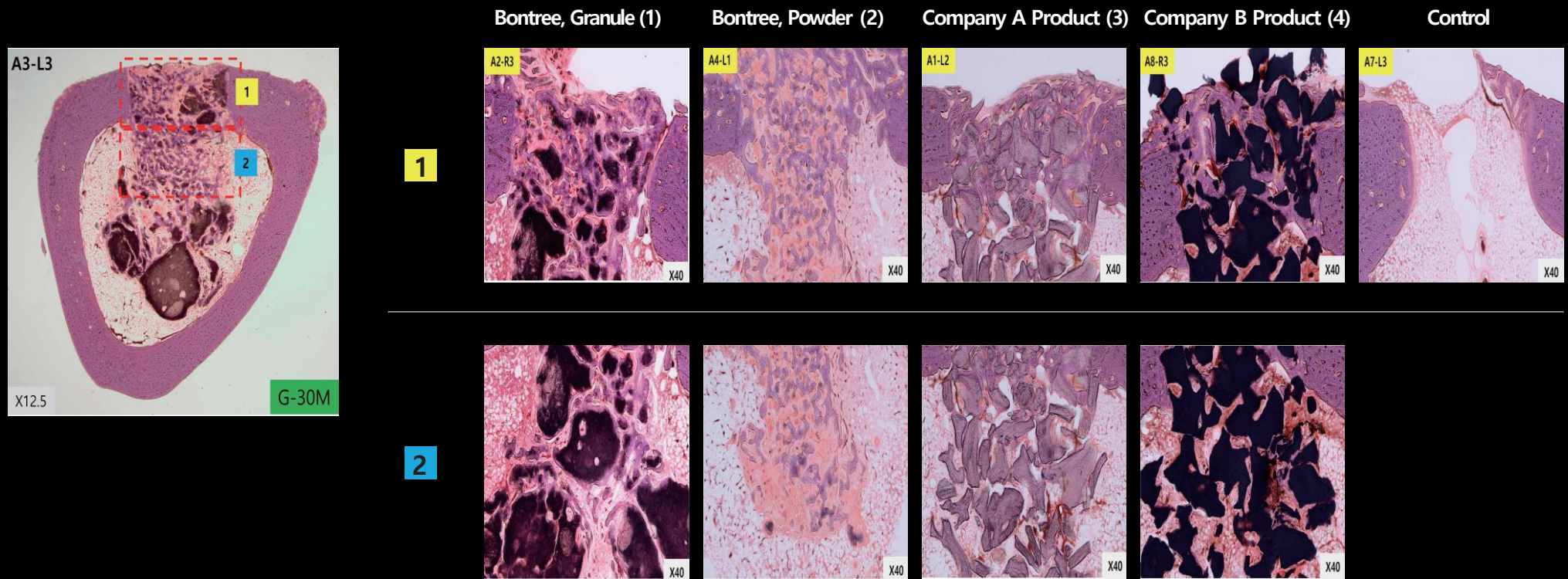
※ Control Group: Company A, Company B



Result of Evaluation Synthetic Bone Graft Material's Biological Validity (4W)

06

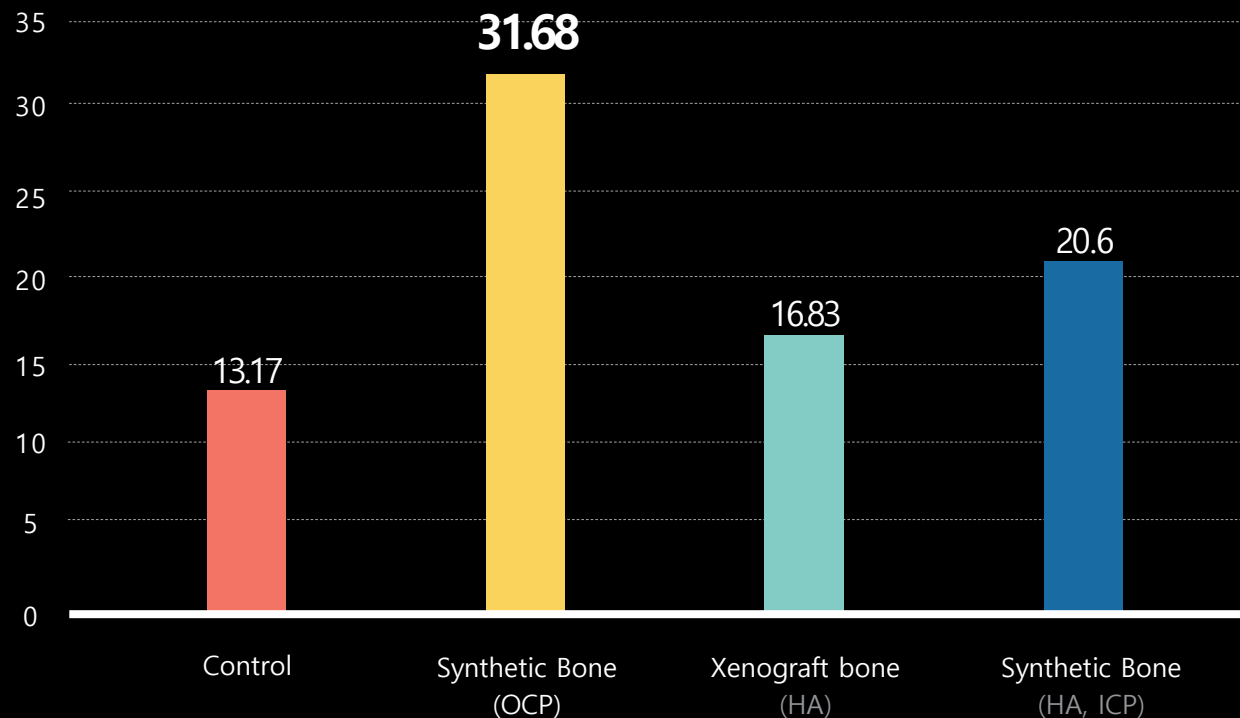
HUDENS BIO's bone graft material is showing outstanding difference even in the SEM (scanning electron microscopy) on the fourth week.



Result of Evaluation Synthetic Bone Graft Material's Biological Validity (4W)

HUDENS BIO's synthetic bone graft material showed very high new bone generation rate compared with existing commercial products.

[4 Weeks Tibia, New bone]



[Summary of Preclinical Study Result (4W)]

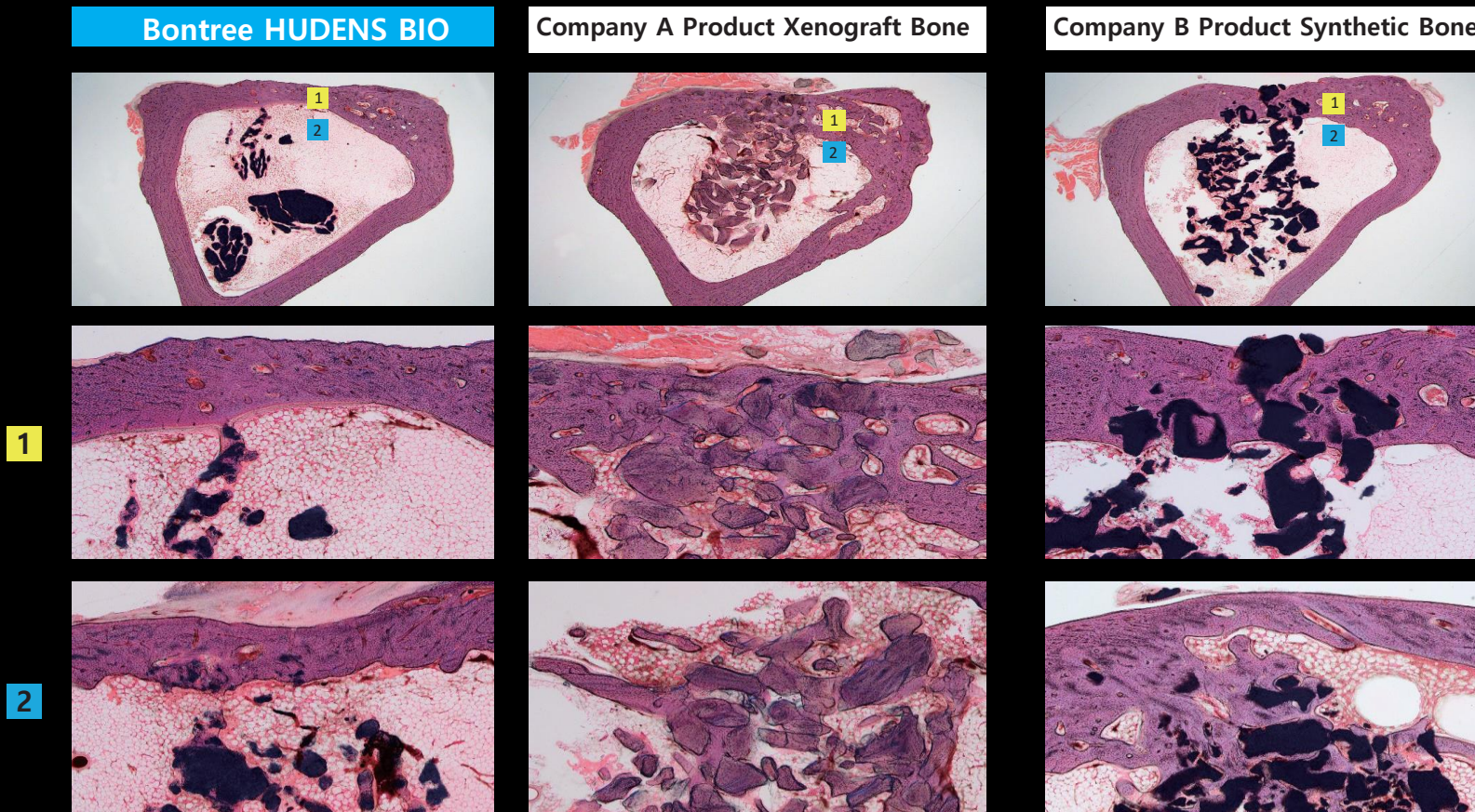
OCP showed very high new bone generation rate compared with existing commercial products such as Xenograft bone and Synthetic bone

*Biological Validity Report

Result of Evaluation Synthetic Bone Graft Material's Biological Validity (12W)

06

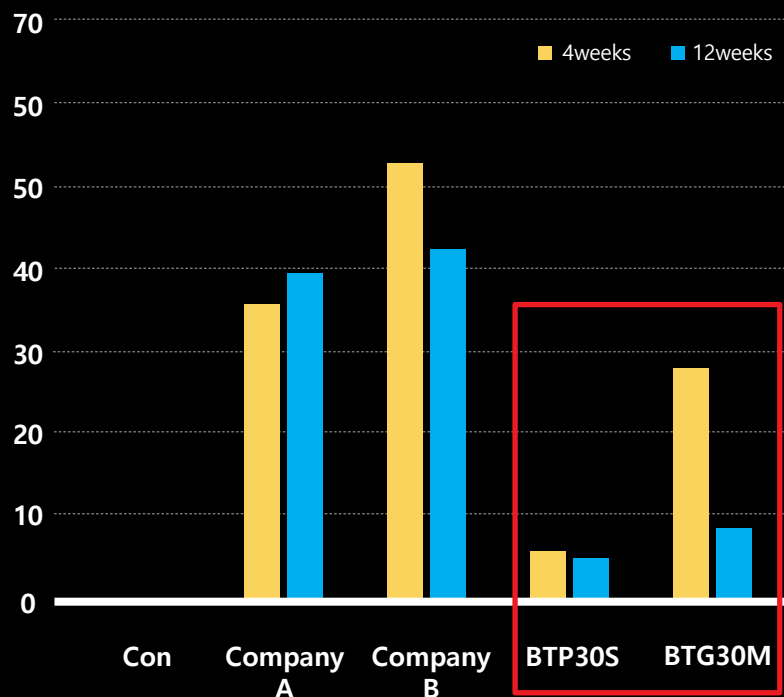
HUDENS BIO's bone graft material is showing outstanding difference even in the SEM (scanning electron microscopy) on the twelfth week.



Result of Evaluation Synthetic Bone Graft Material's Biological Validity (12W)

According to the result on the twelfth week, HUDENS BIO's bone graft material left noticeably fewer remaining materials compared with existing commercial products due to fast Absorption.

[Residual bone graft (%)]



- This matches other studies that reported that OCP displays fast biodegradation rate as it acts as the precursor of human bone and also excellent osteogenic performance among synthetic materials constituted with calcium and phosphorus.
- The Synthetic Bone Graft Material Group in this study demonstrated outstanding new bone generation performance compared to the control group which did not use the graft material in the early stage and similar performance as other products in the market. The defect area in the shine bone of a rabbit was completely healed as fast as twelve weeks after the application. Especially, **test group BTG 30M**, showed the best results among test groups in histological aspects regarding biodegradation, new bone formation, and osteoanagenesis.

03

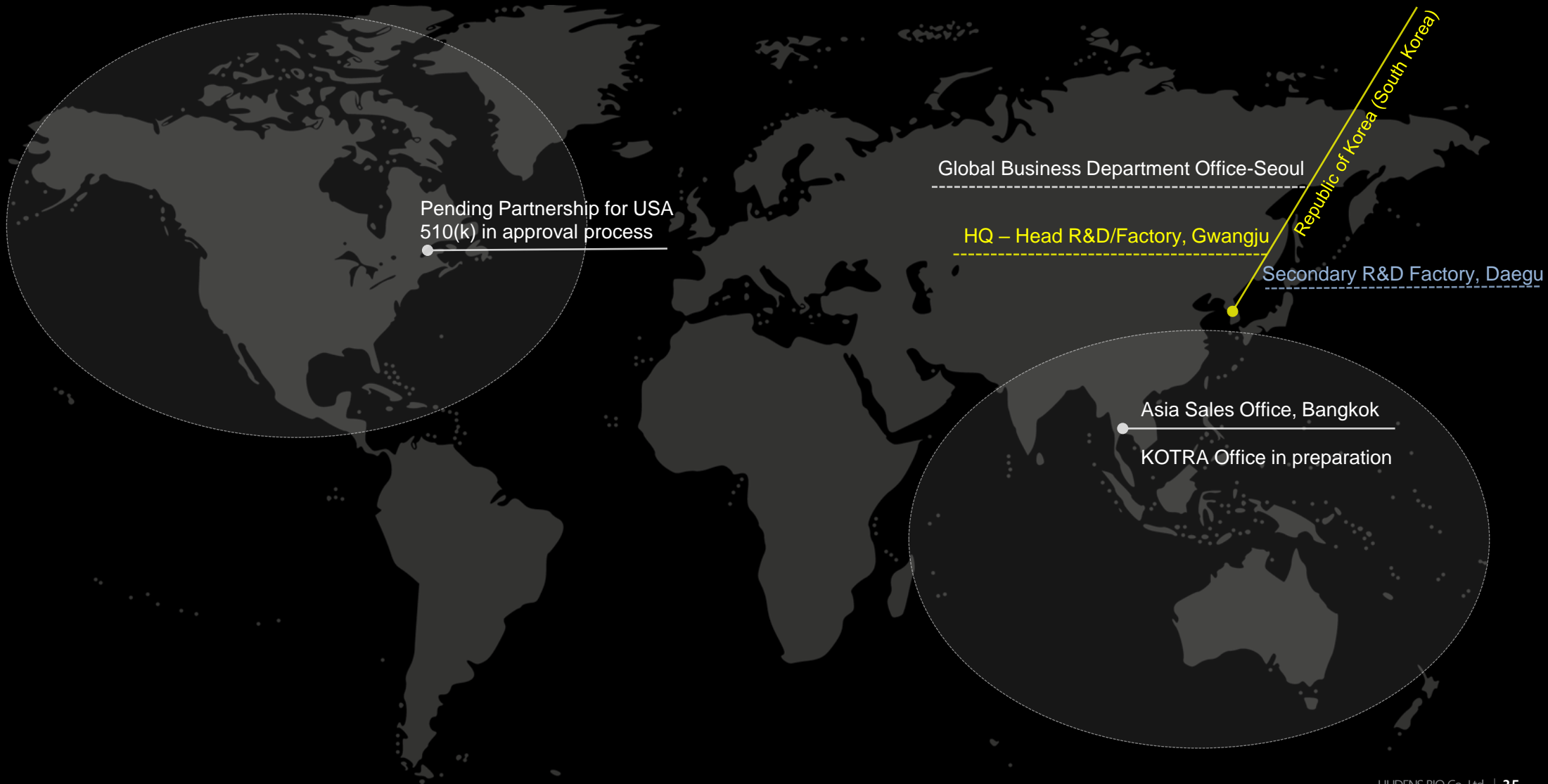
Korea/India Joint Development Project

- 01. Current Sales and Marketing Locations ----- 35~36
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Current Sales and Marketing Locations

01

HUDENS BIO is targeting to improve the global level marketing and sales penetration onto greater scale

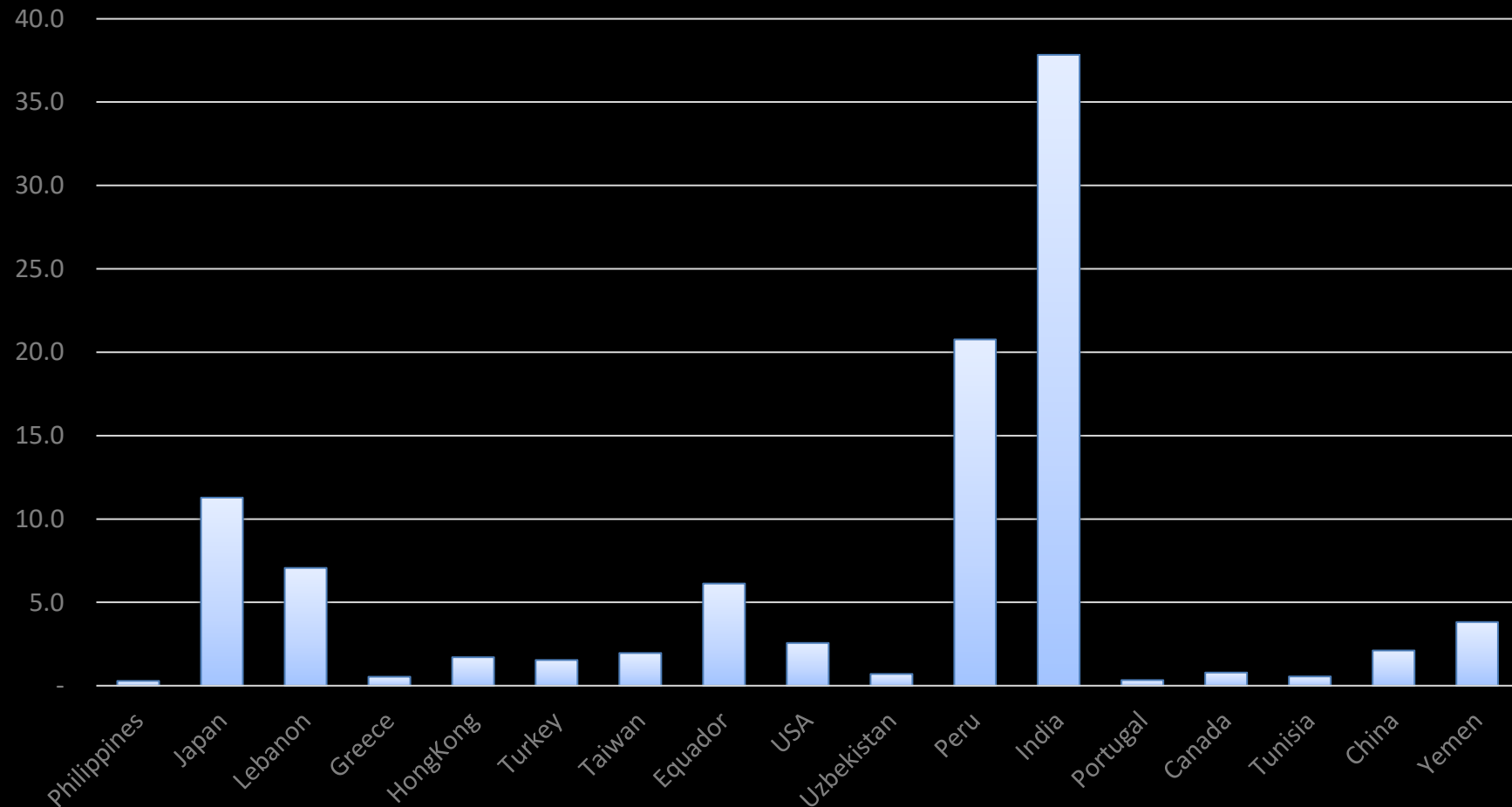


Current Sales and Marketing Locations

01

Looking into the 2020 market share, India is taking part of the most active and largest country among all

Market/Sales Proportion per Country, 2020



Korea/India Joint Development Project

02

Project Duration: 24 months of development strategy with potential market commercialization

Milestone	Deliverables	Indicative Timeline
Milestone 1	Conceptualization, design and production of prototype OCP-BPG composite biomaterial samples using proprietary techniques of Indian and Korean partners; confirmation of batch-to batch reproducibility in composition, porosity, and size of construct (particles or blocks)	8 months (July 2021 ~ February 2022)
	Global Market research and commercialization strategy	
Milestone 2	Material characterization/testing; selection of material with optimum mechanical physico-chemical and in vitro biocompatible properties; and production of prototype product units at pilot level	8 months (March 2022 ~ October 2022)
	Identification of potential countries and commercialization plan	
Milestone 3	Demonstration of biocompatibility of selected biomaterial via in vivo animal studies	8 months (November 2022 ~ June 2023)
	Planning and finalization of business models for target markets	

Korea/India Joint Development Project

02

With known excellency of OCP and bioactive glass material throughout the literatures, having to come together into a single product can potentially bring a sensational storm into the bone graft market to the world

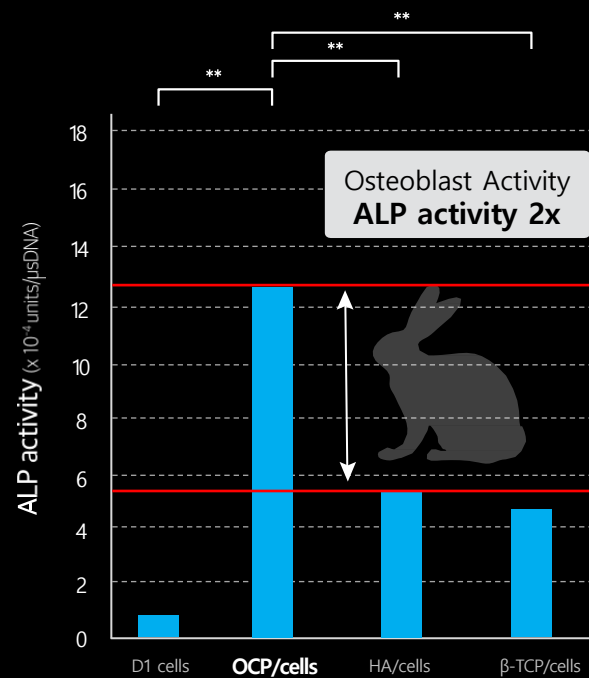


Fig. 3 The ALP activity of D1 cell spheroids and Cap/cell spheroids after 7 days in culture.

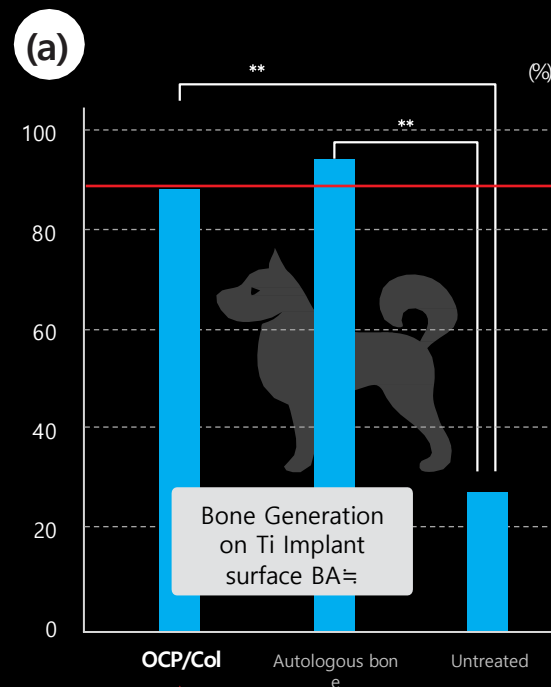
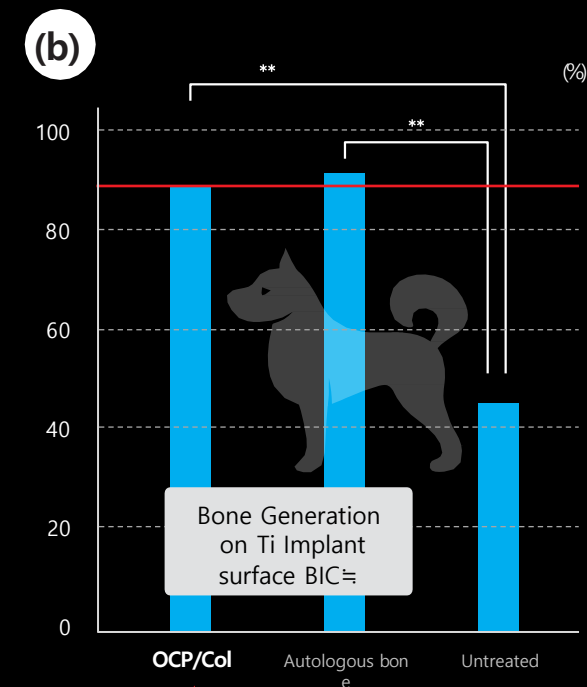


Figure. 6 Histomorphometric analysis of specimens.



(a) BA% and (b) BIC% are shown. $P < 0.01$.

HUDENS
— **BIO**

Thank You For Your Attention

