

Biorepair[®]

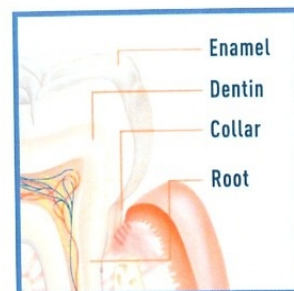
O R A L C A R E

THE ONLY AND ORIGINAL ONE WITH
microRepair[®]
PATENTED INNOVATION
ENAMEL-REPAIRER



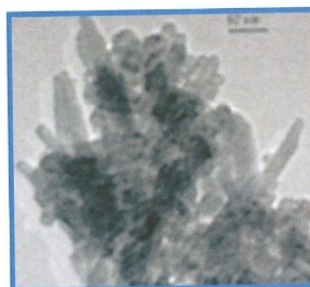
What is hydroxyapatite?

Hydroxyapatite is **the main tooth component**, forming 90% of the enamel and the 70% of the dentin¹⁰. It represents tooth natural defense against plaque, tartar, cavities and dentinal sensitivity¹¹.



What is microRepair®?

microRepair® is the patented active ingredient of Biorepair® products. microRepair® is formed by **hydroxyapatite crystals** (Zinc-substituted-carbonate-hydroxyapatite) similar to natural tooth enamel and able to bind to enamel^{2,3,4} and dentin^{5,6,7} re-creating the natural tooth protection.



Transmission Electron Microscope (TEM)
image of microRepair®

How do microRepair® act?

microRepair® **bind chemically**, in a natural way, to the tooth hydroxyapatite by **repairing* and remineralizing the enamel**. The chemical reaction happens in a natural way, binding the two similar materials one to each other.



UNTREATED TOOTH:

The tooth structure has a cracked surface



Biorepair® ACTION

microRepair®: penetrates into the micro-cracks while repairing the enamel



TOOTH TREATED WITH Biorepair®:

Biorepair® creates a protective layer against cavities, plaque and tartar

What microRepair® crystals do:

- 1 ■ REPAIR TOOTH ENAMEL * 2,3,4
- 2 ■ REDUCE DENTINAL SENSITIVITY⁸
- 3 ■ ANTIBACTERIAL ACTION
- 4 ■ ANTI-CAVITY ACTION⁹

2 Dentin sealing

Prof G. Schmalz Restorative Dentistry and Periodontology, University of Regensburg, Regensburg, Germany

Clinical study about the action of Zn-Carbonate Hydroxyapatite on dentinal permeability.

AIM:

Assessment of the dentinal sealing thanks to the use of Biorepair® containing Zn-Carbonate Hydroxyapatite after a single treatment.

METHOD:

Hydro-dynamic measurement by Flodec-apparatus.

CONCLUSIONS:

Biorepair® has a similar action as professional products, with a long lasting effect.

The results have been published in: HILLER K.-A., KAIKOW A., and SCHMALZ G., 2011. Influence of a Zinc-carbonate-Hydroxyapatite containing toothpaste on dentin permeability. *J Dent Res* 90 (special issue), 622.

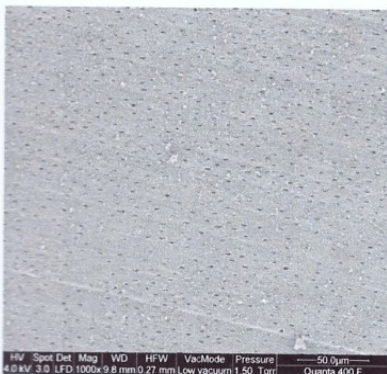
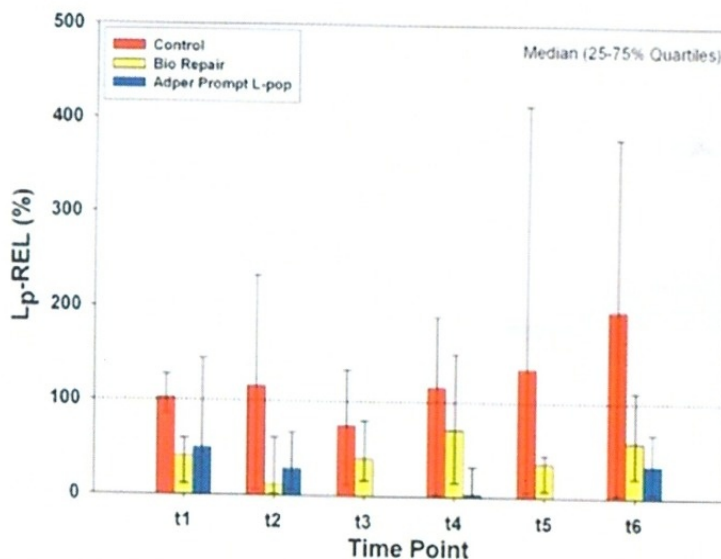
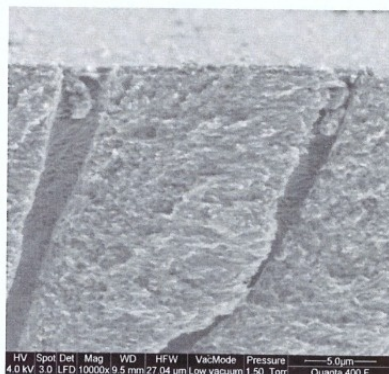
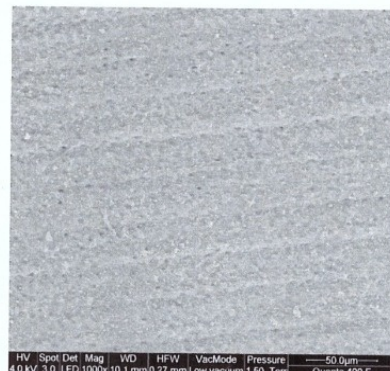


Image of dentin without any treatment



Dentin section after Biorepair® treatment



Dentin after Biorepair® treatment

3 Sensitivity reduction

Prof A. Putignano Department of Clinical Sciences and Stomatology of the Polytechnic University of Marche, Via Tronto 10/A 60026 Ancona, Italy

Clinical study about the action of Zn-Carbonate-Hydroxyapatite in reducing dentinal sensitivity.

AIM:

In vivo assessment of sensitivity reduction by using Biorepair® toothpaste containing Zn-Carbonate Hydroxyapatite.

METHOD:

Blind test on two groups of patients; comparison between Biorepair® and a toothpaste containing Potassium Nitrate / Sodium Fluoride.

DURATION:

8 weeks

Scanning Electro Microscopy along with simple analysis (SEM - ED AX), X rays and infra-red spectroscopy

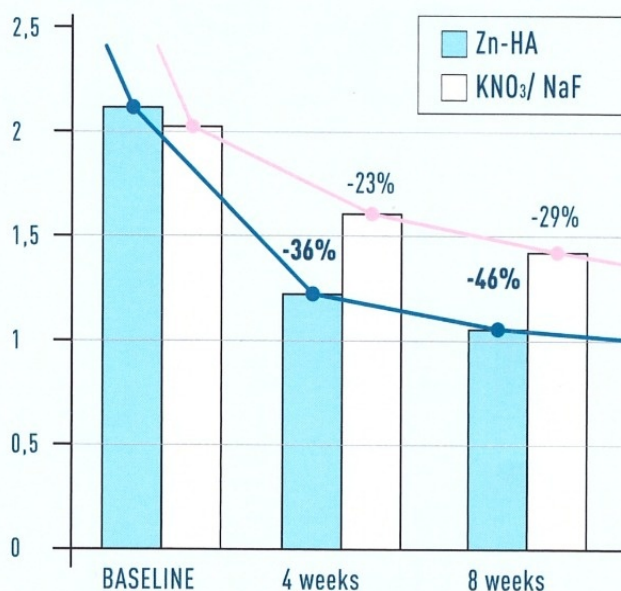
CONCLUSIONS:

This study demonstrates that Biorepair® containing Zn-Carbonate-Hydroxyapatite reacts rapidly by decreasing the dentinal sensitivity.

Published in Journal of Clinical Periodontology, 37, 510-517, 2010.

Biorepair® with microRepair® = Zn-HA (Zinc hydroxyapatite)
Toothpaste with Fluoride and Potassium Nitrate = NaF/KN03



AIR TEST



	AIR TEST	
	Zn-HA	KNO ₃ / NaF
BASELINE	2,16	2,01
4 weeks	1,39	1,56
8 weeks	1,17	1,42
Δ BETWEEN BASELINE AND 8 WEEKS	46,00%	29,00%

Dentinal hypersensitivity reduction in %

Comparison with fluoride based technologies*

ACTIVE INGREDIENT	Pro-Argin®	Novamin®	Amino Fluoride	CPP-ACP	NR-5™	BIO-ACTIVE COMPLEX	microRepair®
COMMERCIAL PRODUCT	Elmex Sensitive Professional	Sensodyne Repair & Protect	Elmex Sensitive	GC MI Paste Plus	REGENERATE	BIOSMALTO	Biorepair®
CONTAINS HYDROXYAPATITE	NO	NO	NO	NO	NO	YES	YES
DEPOSITS NEW ENAMEL ON THE ENTIRE TOOTH SURFACE at every usage	NO	NO	NO	NO	NO	NO	YES 
SEALS THE DENTINAL TUBULES	YES with different material compared to the one teeth are made of	YES with different material compared to the one teeth are made of	NO	NO	NO	YES	YES 
REDUCES SENSITIVITY IN 30 SECONDS	YES	NO	NO	NO	NO	NO	YES
PREVENTS PLAQUE AND TARTAR	YES with Fluoride	YES with Fluoride	YES with Fluoride	YES with Fluoride	YES with Fluoride	YES	YES with microRepair® + Zinc PCA
FLUORIDE FREE	NO	NO	NO	NO	NO	NO	YES
TITANIUM DIOXIDE FREE	YES	NO	NO	NO	NO	YES	YES
SLS FREE	NO	YES	YES	YES	NO	YES	YES
ALSO AVAILABLE IN MOUTHWASH	NO	NO	YES	NO	YES Mousse	YES	YES

* Comparison based on information contained on packaging and brand website.

THE ONLY WITH *microRepair*® ENAMEL-REPAIRER

¹ Characterization of the solid components of three desensitizing toothpastes and a mouth wash; A. Peetsch, M. Epple; Mat.-wiss. u. Werkstofftech. 2011, 42, No.2 -

² Remineralization/repair of enamel surface by biomimetic Zn-carbonate hydroxyapatite containing dentifrice; A. Lorenzini, G. Orsini, M. Lelli, M. Marchetti, I. Foltran, F. Sampalmieri, M. Procaccini, N. Roveri, A. Putignano; IADR San Diego, California, 16-19 marzo 2011.

³ Surface enamel remineralization: biomimetic apatite nanocrystals and fluoride ions different effects; Roveri N., Battistella E., Bianchi C.L., Foltran I., Foresti E., Iafisco M., Lelli M., Naldoni A., Palazzo B., Rimondini L.; Journal of Nanomaterials 2009; 2009; 1-9.

⁴ Synthetic Biomimetic Carbonate-Hydroxyapatite Nanocrystals for Enamel Remineralization; Roveri N., Battistella E., Foltran I., Foresti E., Iafisco M., Lelli M., Palazzo B., Rimondini L.; Advanced Materials Research 2008; 47-50; 821-824.

⁵ Influence of a Zinc-Carbonate-Hydroxyapatite containing tooth paste on dentin permeability; K.-A. Hiller, A. Kaikow, and G. Schmalz; IADR San Diego, California, 16-19 marzo 2011.

⁶ Impact of two toothpastes on repairing enamel erosion produced by a soft drink: An AFM in vitro study; C. Poggio, M. Lombardini, M. Colombo, S. Bianchi; Journal of Dentistry, 2010, 38 (11); 868-874.

⁷ A double-blind randomized controlled trial comparing the desensitizing efficacy of a new dentifrice containing carbonate/hydroxyapatite nanocrystals and a sodium fluoride/potassium nitrate dentifrice; Orsini G., Procaccini M., Manzoli L.,

Giuliodori F., Lorenzini A., Putignano A.; J Clin Periodontol 2010; 37; 510-517.

⁸ Natural enamel wear - A physiological source of hydroxylapatite nanoparticles for biofilm management and tooth repair?; Hannig C., Hannig M.; Medical Hypotheses; 74 (2010) 670-672.

⁹ S. V. Dorozhkin, Calcium Orthophosphates, J Mater Sci (2007) 42: 1061-1095.

¹⁰ Enamel and dentine remineralization by nano-hydroxyapatite toothpastes; Peter Tschoppe, Daniela Leal Zandim, Peter Martus, Andrej M. Kielbassa; Journal of Dentistry, In Press, Uncorrected Proof 2011.

*With daily usage twice a day. In vitro test. Repair action referring to the microRepair® covering of the micro-scratches on the surface of the enamel [no cavity lesions or chipped teeth].

Biorepair®

ORAL CARE

Biorepair®



Biorepair® Plus



Biorepair® Bacteriostatic Accessories



1 Enamel repairing

Prof A. Putignano Department of Clinical Sciences and Stomatology of the Polytechnic University of Marche, Via Tronto 10/A 60026 Ancona, Italy
Prof N. Roveri Department of Chemistry "G. Ciamician", Alma Mater Studiorum, University of Bologna, Via F. Selmi, 2, 40126 Bologna, Italy

AIM:

In vivo assessment of remineralization/repair of the tooth enamel by using Biorepair® toothpaste containing Zn-Carbonate Hydroxyapatite.

METHOD:

Blind test on two groups of patients; comparison between Biorepair® and a toothpaste containing Potassium Nitrate / Sodium Fluoride.

DURATION:

8 weeks

Scanning Electro Microscopy along with simple analysis (SEM - EDAX), X rays and infra-red spectroscopy.

CONCLUSIONS:

This study demonstrates that Biorepair® containing Zn-Carbonate Hydroxyapatite, unlike toothpastes containing Potassium Nitrate / Sodium Fluoride, is able to **repair the superficial enamel** thanks to a bio-mimetic protective layer

The results have been published in: LORENZINI A., ORSINI G., MARCHETTI M., FOLTRAN I., SAMPALMIERI F., PROCACCINI M., ROVERI N., and PUTIGNANO A., 2011. Remineralization/repair of enamel surface by Zn-Carbonate Hydroxyapatite containing dentifrice. *J Dent Res* 90 (special issue), 2621.

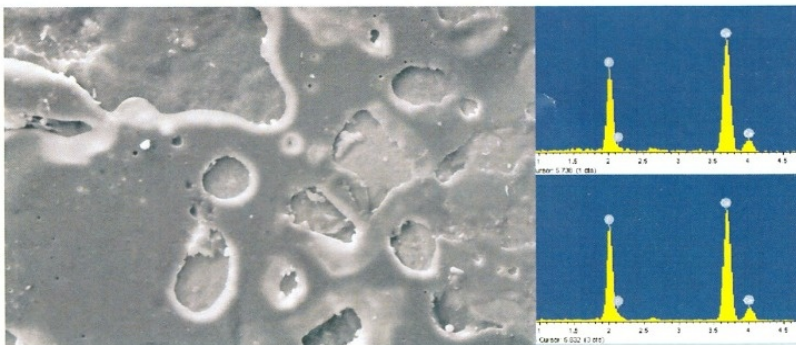


Image of the enamel after a 8 weeks treatment with Biorepair® demonstrating the formation of a new apatite layer.

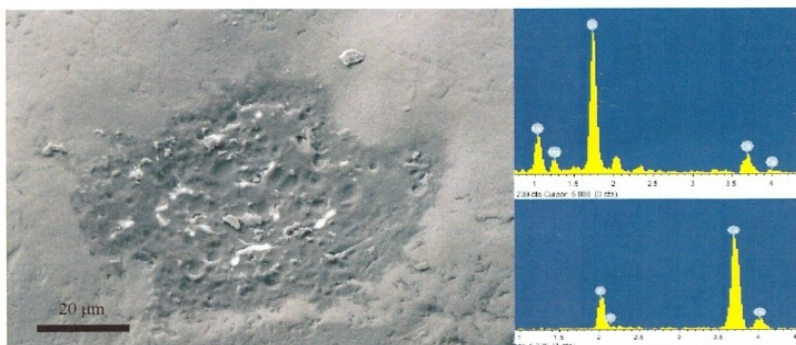


Image of the enamel after a 8 weeks treatment with a Fluoride containing toothpaste. No remineralization.

4 Anti-cavity action

Prof A. M. Kielbassa Department of Operative Dentistry and Periodontology, Charite-Universitaetsmedizin Berlin, Berlin, Germany

Study of the action of Zn-Carbonate Hydroxyapatite on cavities.

AIM:

In vitro assessment of the anti-cavities activity of Biorepair® toothpaste, containing Zn-Carbonate Hydroxyapatite.

METHOD:

This study has been conducted on extracted teeth of bovine origin by comparing Biorepair® with a toothpaste containing Sodium Fluoride. Its effect has been evaluated both on enamel and dentin.

DURATION:

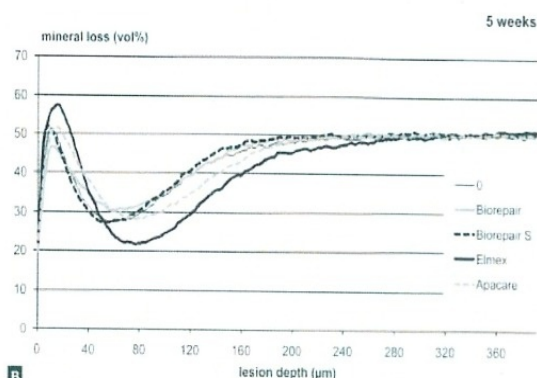
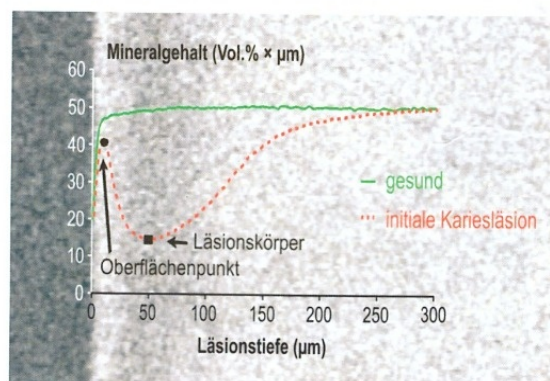
5 weeks

CONCLUSIONS:

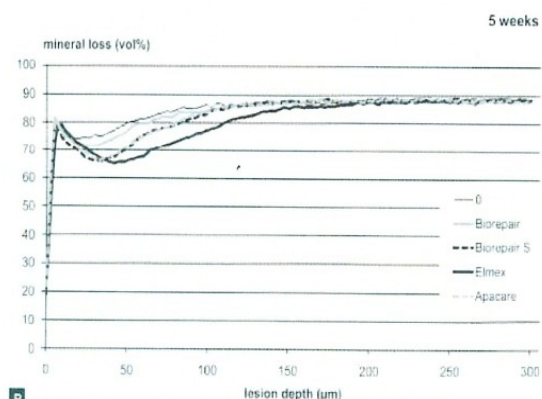
This study demonstrates that Biorepair® containing Zn-Carbonate Hydroxyapatite has a superior remineralizing effect than toothpastes containing Fluoride.

The results have been published in: TSCHOPPE P., LEAL ZANDIM D., MARTUS P., KIELBASSA A., 2011. Effect on nano-hydroxyapatite in toothpastes on bovine dentin subsurface lesions. *J Dent Res* 90 (special issue), 2641.

Enamel and dentin remineralization by nano-hydroxyapatite toothpastes. *Journal of Dentistry*, 'In Press, Uncorrected Proof, 2011.



Dentin remineralization



Enamel remineralization