throughout the lesion by inhibiting of surface layer formation, while the pH results suggested an inhibitory effect of LRAP on the crystal growth.

Conclusion: This study showed that the treatment of eroded lesions in enamel by LRAP can improve and regulate the pattern of remineralization in-vitro.

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New nanostructured odontoiatric resins: Surface roughness and endocrine disruptors release

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Purpose: Composite resins currently used for odontoiatric purposes do not cover entirely the ideal requirements especially with respect to mechanical properties and potential release of endocrine disrupting chemical-EDCs (e.g. Bisphenol A and related compounds). The replacement of silicon dioxide with nanostructured nanofillers is expected to induce substantial improvements with respect to both mechanophysical and biocompatibility properties.

Methods and materials: The anodized porous alumina (APA) was obtained through a well-known electrochemical process capable of structuring anodized alumina with ordered porosity: the nanostructured surface was fragmented and inserted as a filler in the Bis-GMA resin for a standard polymerization treatment.

Results: These samples were compared with commercial resin specimens via atomic force microscope (AFM) analyses to assess the properties of the surface and the adaptability to dental tissues. Samples analyses were extended to physicochemical and biochemical properties to evaluate the mechanical stress properties and the potential release of EDCs. The results of these analyses prove that the mechanical properties of the resin loaded with investigational APA are better than those of the commercial resin. The biocompatibility of the experimental resin is better for the lack of silanization in the process of insertion of the filler. The release of estrogenic/antiestrogenic compounds from commercial composite resins was evaluated by the E-SCREEN assay in view of the widespread prophylactic application of these materials in pediatric dentistry. These results are compared with similar tests on trial samples of APA nanostructured material.

Conclusion: The outstanding mechanical properties and the biocompatibility offered by the nanostructured APA filler suggests to improve the interface with the natural dental tissue.

Keywords: Dental restoration; Composite resins; Mechanical properties

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Reinforced bioactive bone chip scaffold for bone regeneration: Experimental study

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Purpose: Scaffolds play a critical role in tissue engineering, which aims to regenerate missing tissues or organs. For developing an effective bone regeneration strategy, we studied the efficacy of bone regeneration using the innovative bone scaffold "Reinforced Bioactive Bone Chip" (IBI S/A-Mezzovico, Ticino-CH), which has been specifically developed for applications in regenerative medicine and therapy bone tissue engineering, on the calvarial defect of rats.

Methods and materials: A full-thickness defect (5 mm × 8 mm) was created on each parietal region of Wistar rats (Harlan, Italy) by piezosurgery, a surgical technique that creates an effective osteotomy with no trauma to soft tissue and without causing bone necrosis. Bone scaffold was implanted in the right cranial defect whereas the left defect was used as control. Macroscopical evaluation of the surgical site and histological studies were performed to investigate the level of bone formation.

Results: The results confirmed that the treated defects with "Reinforced Bioactive Bone Chip" scaffold showed significant bone formation and maturation in comparison with the control group.

Conclusion: These results are promising and "Reinforced Bioactive Bone Chip" could be considered for future clinical use in human, mainly in the field of regeneration and/or replacement of bone tissue compartment of maxillofacial surgery.

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