

Photo-curing 3D printing and innovative design of porous composite structures for biomedical applications

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Abstract.

Light activated resins and composites are employed in conjunction with a light curing unit, thus allowing an on-demand process of polymerization. They generally represent the most popular choice in the restorative dental practice. Over the past years, the use of non-degradable scaffolds and mesenchymal stem cells has also been proposed in regenerative medicine.

With regard to the repair, regeneration and reconstruction of damaged tissues, 3D porous structures have been developed as biodegradable and non-biodegradable scaffolds. In the latter case, the designed pore geometry and porosity can allow to modulate the structure stiffness and to promote tissue ingrowth, thus stabilizing the implanted device.

In the current research, design strategies and photo-curing 3D printing were employed to fabricate 3D porous composite structures with optimized functional properties.