POLYMERIC STRUCTURES WITH BIO-LIKABLE CHARACTERISTICS BY VAT POLYMERIZATION 3D PRINTING

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Nowadays, 3D printing is one of the technological threads with the greatest socio-economic effect. It has introduced new paradigms in the manufacturing processes, indeed it is considered one of the fundamental pillars of the so-called Industry 4.0.[1] The 3D printing operational principle is the object fabrication through the spatial-controlled deposition of material (layer-by-layer), allowing the fabrication of bespoke parts with *quasi* any geometric shape just from a digital design. Besides, the printed parts might be produced more efficiently and with lesser energy and material waste than conventional manufacturing techniques. Various industrial sectors have noticed these 3D printing features in manufacturing parts for different industrial sectors such as mechanical, aerospace, electronics, food industry, and biomedical.[2] In this latter sector, 3D printing has found a special place to produce customized medical implants, biological models, or biomedical analytical systems. In this scenario, polymeric 3D printing is largely used for medical applications thanks to the relatively wide availability of printable polymers, offering a wide palette of different properties for many particular biomedical purposes where personalized devices or implants are promptly required.[3] Even though we can produce biomedical pieces of any geometric shape and in anyplace through 3D printing, we still cannot print any material.

The studies presented in this investigation have focused on developing and fine-tuning photosensitive polymeric resins to produce structures with bio-likable features (e.g., antibacterial or biocompatibility) *via* light-based 3D printing. By merging the freedom of design of 3D printing with the appropriate printable material development, unique structures can be produced with fascinating bioproperties. The developed materials and methods reported here might be applied as novel means for biomedical purposes, particularly in point-of-a-care medicine.

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