

L21

High Resolution 3D Printing and Bioprinting with Femtosecond Lasers

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Multiphoton lithography (MPL) is set of methods offering a possibility of 3D structuring of a variety of materials at a high spatial resolution, unmatched by other additive manufacturing approaches. MPL relies on the nonlinear absorption of femtosecond laser pulses to induce photochemical processes, not necessarily limited to photopolymerization alone. An increasing portfolio of available materials enables utilization of the versatile capabilities of MPL, from producing complex volumetric 3D structures by means of cross-linking, to creating void patterns within hydrogels already containing living cells. In this regard, MPL offers numerous possibilities for biomedical and tissue engineering research, as well as microfluidic and organ-on-chip applications. In this presentation, our recent progress in this area will be discussed.