A suitable surface is vital for maintaining or even promoting cells' function and communication. Researches indicated that nanostructured coatings could have a potential in improving cell adhesion [1]. However, it hardly minimizes the contamination by using traditional solution-coating technology. Matrix assisted pulsed laser evaporation (MAPLE) technique is a contamination-free process that meets the requirements of an efficient process to deposit biopolymer without damaging their backbone on the surface of various substrates [2].

As shown in Figure 1 up-conversion nanoparticles (NaGdF$_4$: Yb$^{3+}$, Er$^{3+}$, UCNPs) with/without immunoglobulin G (IgG) modification were produced by a one-pot synthesis method. MAPLE system equipped with Nd:YAG laser ($\lambda = 532$ nm, $\nu = 10$ Hz) is applied to deposit UCNPs with/without IgG modification on the glass bottom of the culture dish. The results show different behaviors of human umbilical vein endothelial cells (HUVECs) cultured on the culture dishes coated with UCNPs with/without IgG, compared to the control sample (glass coated with gelatin). No toxic effect is imposed on cells. The results of this work indicate that the nanostructured coatings enhance the adhesion and proliferation of cells and MAPLE is an efficient method in the fabrication of nanostructured biomaterials coating.
