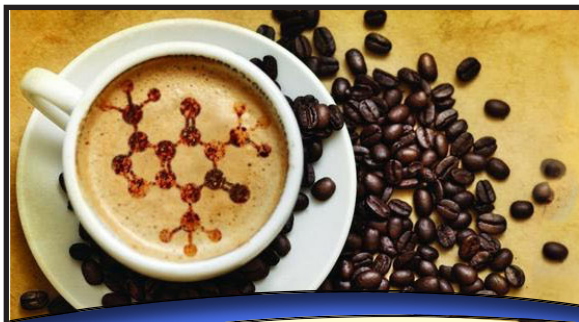

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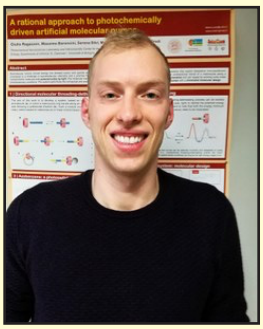
Photopatterning of optically active nanofibers with spatial and orientational control



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Self-assembly is a very promising approach to develop new architectures or materials [1]. The spontaneous organisation of pre-existing components into patterns or structures allows to attain order from new length scales over the organization of polymers, nanoparticles and small molecules [2]. However, the self-assembly process does not readily extend to larger length scales and instead multi-domain structures are formed. Using laser irradiation, we target to control the self-assembly of a dissolved small molecule gelator (DDOA, 2,3-didecyloxyanthracene [3]) into fluorescent nanofibers by the photocleavage of a precursor. A confocal microscope set-up is used with dual laser input for writing spatially defined nanostructures and imaging. The patterning of lines and rectangles (fig 1) occurs with separate control over the nucleation and growth by laser-scanning and wide-field illumination. This technique also provides to pattern anisotropic micrometric patches of aligned nanofibers, with variable control of each micro-pattern (Fig 1).

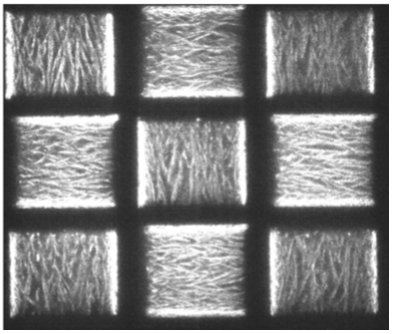

Fig. 1. An example of patterned DDOA nanostructures obtained by photo-induced self-assembly through focused laser irradiation. Image size is 80x80 micron.

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[3] C. Giansante, G.Raffy, C. Schäfer, H. Rahma, M-T Kao, A.G.L. Olive, A Del Guerzo, J. Am. Chem. Soc., 2011, 133, 316-325.

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