

Theranostics over different length scales: From nanoparticles, to supraparticles, and beyond

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This talk aims at presenting the main research areas active at the Politecnico di Milano in the field of nanomedicine. In fact, in the last few years Politecnico di Milano devoted resources to establish expertise in this field activating new research projects focused on the development of innovative nanomaterials for the prevention, diagnosis and treatment of diseases. Different typologies of nanomaterials will be presented such as novel polymeric nanocarriers [1] for targeted delivery to the kidney glomerulus, gold supraparticles for enhanced drug delivery [2] as well as fluorinated emulsions as ^{19}F -MRI imaging tools [3]. Moreover, results on the use of multi-scale mathematical modelling and simulation tools, from sub-cellular to tissue scale for studying the dynamic behaviour of biological systems will be also presented [4].

[1] Bruni R. et al. *Journal of Controlled Release* 2017, 255, 94-107

[2] Maiolo D. et al. *ACS Nano* 2017, accepted for publication

[3] Tirota I. et al. *Journal of American Chemical Society* 2014, 136, 8524-8527

[4] Taffetani M. et al., *Archive of Applied Mechanics* 2014, 84, 1627-1645