

Colloidal nano- and microparticles towards sensing applications in biology

Wolfgang Parak

Philipps Universität Marburg, Fachbereich Physik, Renthof 7, 35037 Marburg. Germany
wolfgang.parak@physik.uni-marburg.de

Nanomedicine nowadays is a popular key word in the media, though everyone seems to associate it with different visions, hopes, and even fears. From the point of view of a materials scientist it will be pointed out what new materials will be possible, how they will be designed, and which properties they could offer for diagnosis and treatment. It will be critically discussed that though sophisticated materials with advanced novel properties will be available in the future, they do not automatically match the requirements and demands of clinicians. The discussion is centred around one example, multifunctional polyelectrolyte capsules which might act as a "nano-submarine" for in vivo sensing and delivery, which is used to highlight promising interfaces between both disciplines.

References:

- [1] C. Röcker, M. Pötzl, F. Zhang, W. J. Parak, G. U. Nienhaus, "A quantitative fluorescence study of protein monolayer formation on colloidal nanoparticles", *Nature Nanotechnology* 4, 577-580 (2009).
- [2] P. Rivera Gil, S. de Koker, B. G. de Geest, W. J. Parak, "Intracellular processing of proteins mediated by biodegradable polyelectrolyte capsules", *Nanoletters* 9, 4398-4402 (2009).
- [3] J. Peteiro-Cartelle, M. Rodríguez-Pedreira, F. Zhang, P. Rivera Gil, L. L. del Mercato, W. J. Parak, "How colloidal nano- and microparticles could contribute to medicine - a personal perspective both from the eyes of physicians and materials scientists", *Nanomedicine* 4, 967-979 (2009).