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Animal blood as a source for the development of fabricated nanobiocomposite and their potential biomedical applications

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Multifunctional nanobiocomposite (NBC) can be fabricated by functionalizing suitable materials on to the nanomaterials. Though many types of nanoparticles are used in biomedical applications, in this study, we have focused on iron nanoparticles (INPs). A NBC was prepared by coating chitosan on to the INPs and coupling the folic acid (F) to the chitosan (C) molecules. Thus prepared NBC (INP-CF) was evaluated for its biocompatibility, toxicity and haemocompatibilty. Fourier transform infrared spectroscopy, X-ray diffraction techniques, Transmission electron microscopy, Scanning electron microscopy, Energy dispersive X-ray spectroscopy, Vibrational sample magnetometer have confirmed the formation of NBC. *In vitro* studies were carried out using breast cancer cell lines (MCF-7) and studied the efficacy of prepared NBC using magnetic resonance imaging techniques. The results have revealed the penetration of NBC into the cancer cells. These results indicate the possible use of the NBC as multifunctional agent for treatment of cancer.

Biography

M. Chamundeeswari is an Associate Professor in St. Joseph's College of Engineering and has completed her B.Pharm. (Pharmacy) in April 1999 from Dr. M. G. R Medical University, Qualified GATE 2002, M.Tech., (Industrial Biotechnology) in May'2004 and Ph.D. (Nanobiotechnology) in Aug'2012, from Anna University, Chennai, India. She has participated in several workshops, seminars and conferences. She has published research papers in reputed International journals with good impact factor and was awarded "Vical Award" for best paper presentation in conference held at Jalandhar, for Indian Institute of chemical engineers in 2009. One of her research article was highlighted in "Nature India" (May'2011 in Research Highlights), subsidiary of "Nature".

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Focused ion beam Ga^{3+} for the realization of piezoelectric PZT nano structures

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Piezoelectric nano-structures (islands of dimensions in the lateral size range 50-500 nm) have been fabricated by Focused Ga^{3+} Ion Beam (FIB) etching on $PbZr_{0.54}Ti_{0.46}O_3$ thin films obtained by magnetron sputtering. The degradation induced by the etching process is investigated through the evolution of electromechanical activity measured by means of local piezoelectric hysteresis loops produced by Piezo-response Force Microscopy (PFM). Two kinds of structures, namely one based on crystallized films and the other based on amorphous ones, were studied. In this latter case, the amorphous films are post-annealed after etching to obtain crystallized structure. For the structures based on the crystallized and then etched films, no piezoelectric signal was registered that evidences a serious degradation of material induced by Ga^{3+} ion implantation. For the structures based on the films etched in amorphous state and then crystallized the piezo response signal was near to that the reference films (crystallized and not etched) whatever were the ion dose and the island dimensions. Even for very small lateral size (50 nm), no size effect was observed. The island shapes fabricated by Ga^{3+} FIB etching process (islands with less than 50 nm lateral size) show a limitation of FIB processing and electron beam lithography seems to be necessary.

Biography

Denis Rémiens is currently at IEMN - CNRS / UMR 8520, is a professor at Institute of Electronique, Microelectronique and Nano technologies Department of OptoAcousto Electronique and the Leader of the MIMM (Materials for Integration in Microelectronique and Micro systems) Team in Université de Valenciennes et du Hainaut Cambrésis (UVHC). His Research activities are growth of ferroelectric and piezoelectric PZT, PMN-PT thin films by RF sputtering, structural and electrical characterization of ferroelectric and piezoelectric thin films and MEMS and NEMS devices realization (piezoactive actuators and sensors, tunable devices for wireless telecommunication) and mainly focused on functional materials and applications. He has published more than 180 publications during the period 2000-2012 and at the same period, more than 150 communications in national and international conferences. Also he is the leader in France of the ferroelectric thin films community.

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