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Targeted inorganic nanodevices for breast cancer diagnosis and therapy

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Among the various kinds of tumors, breast cancer represents a target of primary interest, both from a diagnostic and a therapeutic point of view. In this context, powerful target-specific magnetic nanodevices can represent efficient contrast agent for MRI detection and good delivery system for anticancer drugs. Nowadays, many efforts are devoted to design nanosystems which can be localized at cancer cells for an extended period of time, in order to optimize diagnostic sensitivity and therapeutic efficiency. A valid example is represented by a versatile molecular superparamagnetic nanocomplex, functionalized with the commercial anti-human epidermal growth factor receptor 2 (HER2) trastuzumab (TZ) or TZ-derivatives. Several *in-vitro* and *in-vivo* experiments demonstrated the dependence of HER2 targeting efficiency from the structural features of the immobilized homing ligands. Moreover, the importance of precisely controlling the ligand density on the nanoparticle surface for optimizing active targeting and therapeutic effect was demonstrated. The best *in-vivo* activity was obtained with mono functionalized Tz- as compared with bifunctionalized Tz-nanoparticles.

Biography

Luisa Fiandra has completed his PhD and Post-doctoral studies from the Department of Biology of the University of Milan (Unimi), working in the field of transport physiology with a specific interest in permeability processes through intact epithelia and cell membranes. From 2010 to 2015, she has been Senior Researcher at L. Sacco Hospital (Milan), where she contributed to the establishment of the Nanomedicine Unit, and was the scientific coordinator of the NanoMeDia Project, funded by Regione Lombardia (Italy). Today, she is carrying out her research activity, focusing mainly on the breast cancer targeting and therapy by nanoformulated drugs and on the delivery of antiretrovirals across biological barriers, at the Department of Biomedical and Clinical Sciences "L. Sacco" of Unimi.

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