



***Ph.D. School in Chemical Sciences
Cycle XXXVIII***

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Research project title: Design and characterization of functional of anticancer protein nanocages

Key words: Protein nanocages; bio-nanoparticles; self-assembling proteins, protein engineering; functional nanomaterials

Research project abstract: Natural self-assembling oligomeric structures, like viral capsids, lipid membranes and shell-like proteins can represent suitable scaffolds to design nanoparticles useful in several biotechnological applications, such as targeted drug delivery, diagnostics and sensor development. Among these systems, ferritin nanocages (Fts) are very attractive. In fact, the easy recombinant production and the possibility to disassemble and reassemble the hollow-like structure *in vitro* made the protein very promising for the encapsulation of bioactive molecules. In addition, the protein surface can be functionalized, to add new functionality and/or to allow a selective delivery of cargos. Based on these premises, this research project will develop new functionalized Ft nanocages with anti-cancer activity and will analyze their structural and functional properties. The characterization will include antitumor activity, immunogenicity, stability and high-resolution structural studies