

Encapsulation of ICOS-Fc in biocompatible and biodegradable nanoparticles elicits novel therapeutic activities

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Abstract

ICOS is a T cell co-stimulatory molecule binding ICOSL expressed on several cell types, including osteoclasts, vascular endothelial cells and several tumor cell types. ICOSL triggering by a soluble recombinant form of ICOS (ICOS-Fc) inhibits osteoclast activity *in vitro* and development of osteoporosis in mice *in vivo*. Moreover, it inhibits migration of tumor cells *in vitro* and tumor metastatization *in vivo*, but it has no effect on the growth of primary tumors. In this work, we show that loading of ICOS-Fc into either cross-linked cyclodextrin nanospheres (CDNS) or poly(lactic-co-glycolic acid) (PLGA) nanoparticles (NP), in order to increase stability, sustain release, and increase tumor-delivery of the drug, elicits a strong antitumor activity ascribable to inhibition of tumor neoangiogenesis and resetting of the anti-tumor immune response. The substantial *in vivo* activity of ICOS-Fc in NP makes these nanoformulations attractive candidates for modulating ICOS-Fc activity and eliciting novel therapeutic activities.

Biography

The research of Dr. Gigliotti is outlined in different fields having as a key point the immune system and the role of the interaction of the costimulatory molecule ICOS and its ligand ICOSL *in vitro* and *in vivo*. His studies also include the bone system and, in particular, osteoclasts which are cells of immune origin. The research gave rise to two patented drugs inhibiting bone resorption and tumor growth, respectively. He is currently CEO of Novaicos srls, a biotech company aimed to develop innovative approaches to correct tissue dysfunctions.

