

<b>Title</b>	<b>Tumor-targeting peptidomimetics: synthesis and bio-medical applications</b>
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**Project description:**

Peptides and peptidomimetics are privileged options to develop small molecules targeting tumor-specific antigens involved in protein-protein interactions (PPI). This approach poses a whole new set of challenges to chemists for the design and synthesis of molecules with the potential of being evolved in therapeutic and diagnostic tools in oncology. We are addressing a selected group of well-characterized targets, relevant in cancer biology, by using peptidomimetics or non-natural oligomers folding into well-defined structures (foldamers).

In addition to this approach, *i.e.* inhibiting dangerous PPI, we will explore an alternative path that allows us to control tumors via immune-modulation or peptide-membrane interactions. Indeed, this research group has a long standing experience with the peptaibiotics, natural peptides known to interact and to disrupt the phospholipid bilayers.

This type of research, that requires a variety of skills, can be successful only through the collaboration of different laboratories. Therefore, synthesis and spectroscopic analyses will be carried out in Padova, whereas computational modeling and biological assays will involve a collaborative Italian network.

In summary, with this research we aim at accomplishing the following strategic objectives:

1. identification of tumor targeting peptidomimetics and foldamers (PPI inhibitors);
2. synthesis of multimeric and nanoscaled systems for drug delivery and cancer imaging;
3. synthesis and study of peptides and foldamers controlling tumors via immune-modulation or peptide-membrane interactions.

**Publications:**

*Org. Biomol. Chem.* 10, 1285-1299, 2012; *Chem. Biodivers.* 11, 1163-1191, 2014; *Biochim. Biophys. Acta-Biomembr.* 1848, 134-144, 2015; *Biopolymers (Pept. Sci.)* 106, 6-24, 2016.

**Collaborations/Network:**

Prof. Emanuele Papini, University of Padova, Italy; Prof. Simona Oancea, University of Sibiu, Romania; Prof. Lorenzo Stella, University of Rome "Tor Vergata", Italy; Prof. Cesare Gennari, University of Milan, Italy

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