PhD in Chemical Sciences
Department of Chemistry "Ugo Schiff"
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PhD seminar

Synthetic peptides applied as ligands in affinity chromatography and immunoassays and as therapeutics and immunogens agents

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Abstract

Peptides, as well as small organic molecules, can be synthesized easily on a large scale, at low cost, and with high purity. Furthermore, like proteins, they have high affinity and selectivity for their molecular targets. The analysis of proteomes and peptidomes in a vast number of species of microorganisms, plants, and animals, complemented by the chemical synthesis of combinatorial peptide libraries, allows the design of an enormous diversity of peptides. Additionally, the knowledge on sequences susceptible to cleavage by proteases and peptidases facilitates the implementation of rational chemical strategies to maximize peptide resistance to degradation. Moreover, to facilitate their pharmacological or industrial application, peptides can be formulated in micro- and nanometric structures. In this seminar, we will explore some of their most relevant applications and summarize our group's lines of work in the design and synthesis of peptides for their application as: a) therapeutic agents due to their bioactive properties; b) diagnostic agents due to their high affinity for molecular targets; c) as immunogens based on peptide epitopes bound to carrier proteins, nanoparticles or by designing branched peptides (Multiple Antigenic Peptides, MAPs) and lipopeptides and d) as ligands in the purification of proteins by affinity chromatography.