

9th World Congress on

Green Chemistry and Technology

September 17-19, 2018 | Amsterdam, Netherlands

Tannins: A new approach to characterization, chemical modification and processing towards innovative products and nano materials



Claudia Crestini

University of Rome Tor Vergata, Italy

Tannins are natural polyphenols found in higher plants around the globe. They play a significant role in defending the plant against insects, infections, fungi or bacteria; this role stems from their capability to form complexes with proteins, polysaccharides and metals, and hence, provide protection to the vulnerable parts of the plants against invasive microbial extracellular enzymes. However, their exploitation as renewable high added value products are to date not extensive despite their interesting intrinsic properties, including high biocompatibility and biodegradability. The fundamental positive health effects of tannins, which are connected to their high antioxidant activity and their role as radical scavengers, allow for protection from diseases associate with the presence of free radicals in the body, such as cancer, arthritis, and degenerative eye and neurological disorders, and display significant potential for biofilm control undoubtedly revealing intriguing potential for their application in biomedical fields that is yet to be explored. In this frame, our research group, aiming at designing a rational process for tannins valorization developed an innovative ³¹P NMR analytical technique for fast and reliable quantification of all the different phenolic groups present in complex tannins matrices and applied it to the selective functionalization of tannins of different origins and structures in order to tune biological and chemico-physical properties such as, hydrophobicity and chelation. Furthermore, the high tendency to supramolecular interactions was successfully exploited for the design and development of nanostructures for synergistic controlled drug delivery by ultrasonication.

Biography

Claudia Crestini is an Associate Professor at the University of Rome Tor Vergata. She is the Director of the Laboratory of Polyphenols Chemistry and Materials Science. Her work is internationally recognized as a leading contribution to green chemistry using natural polyphenols. It is focused on the development of new methods of structural analysis of polyphenolic polymers, development of new materials and products by chemical/biotechnological modification and development of innovative stimuli responsive nanomaterials from natural polyphenols. She has published more than 140 publications in international refereed journals and over 150 contributions to international conferences and invited presentations. She has an H-index of 41 and citations more than 5000.

crestini@uniroma2.it

Notes: