



**UNIVERSITÀ
DI PARMA**

**La chimica degli alimenti e i giovani ricercatori: nuovi approcci in tema
di qualità,**

sicurezza e aspetti funzionali di ingredienti alimentari

Una giornata per il futuro della ricerca nella Chimica degli Alimenti

Milano, Sala Napoleonica, Palazzo Greppi

25 settembre 2017

BOOK OF ABSTRACTS

HEMPSEED PEPTIDE: PROTEOMIC CHARACTERIZATION AND MOLECULAR INVESTIGATION OF THEIR HYPOCHOLESTEROLEMIC EFFECT ON HUMAN HEPATIC CELLS

Carmen Lammi, Gilda Aiello, Chiara Zanoni, Anna Arnoldi
Department of Pharmaceutical Sciences, Via Mangiagalli, 25, 20133 Milan

carmen.lammi@unimi.it

Hempseed is an underexploited non-legume protein-rich seed. The increasing use in human nutrition and the potential nutraceutical applications suggest improving the knowledge of its potential health benefits [1, 2]. In this context, the hypocholesterolemic property of hemp peptides has been investigated in human hepatic HepG2 cell line. Using a multidisciplinary approach two main goals have been achieved: a) the preparation of a peptic hydrolysate from hempseed protein and a detailed characterization of its composition by nano HPLC-MS/MS; and b) the elucidation of the mechanism through which these peptides mediate a cholesterol-lowering effect in HepG2 cells, by molecular and functional investigations on the low density lipoprotein receptor (LDLR) pathway. A hempseed protein hydrolysate has been prepared hydrolyzing total hemp protein using pepsin. Afterwards, the peptide mixture composition has been characterized using a HPLC-MS/MS approach and the biological activity has been investigated using molecular and functional techniques. For the first time, this work provides evidence according to which hemp peptides are able to exert hypocholesterolemic effects through the up-regulation of the LDLR due to the activation of the sterol regulatory element-binding protein (SREBP)-2 pathway. Our results suggest that hemp peptides are able to exert cholesterol-lowering effects with a statin-like mechanism.

References

[1] Callaway, J. C. Hempseed as a nutritional resource: An overview. *Euphytica* **2004**, *140*(1-2), 65-72.