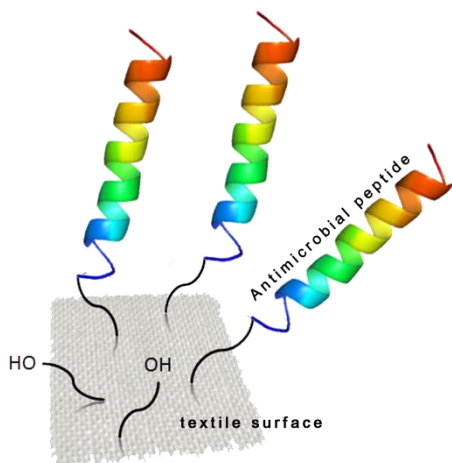


Title	Development of new therapeutic textiles through green chemical methods
PI	PEGGION Cristina
Research Group	Bio Organic Chemistry group – DiSC
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Project description:

The proposed PhD project has two main objectives:

- To develop therapeutic tissues that prevent bacterial and mycotic skin infections. The study should produce a biocompatible and well tolerated fabric, that must be and able to give relief and care for people suffering from skin diseases and allergies.
- To develop a general “green” protocol in the total respect of the environment to link a biological active peptide of interest on a biocompatible textile support.



To reach the objectives, we will use, as the protecting agents, natural antimicrobial peptides (AMP) that are normally produced by skin as first barrier against microbial and bacterial attack (*defensins, cethelidins...*). For the textile, we will focus on natural abundant sources such as cotton and silk supports. Concerning the chemical linkage between the peptide and the textile, we will apply the known strategies of the chemoselective ligation that allows chemical reactions to be run in mild conditions with the use of water as the exclusive solvent. Textile samples will be analyzed for their antimicrobial activity against Gram positive and Gram negative bacteria.

With this work the PhD student will enrich his curriculum with cross-cutting skills ranging from the chemical synthesis of peptides to the material chemistry, passing through organic chemistry reaction tools. In addition, he will apply many spectroscopic techniques (FT-IR, XPS, UV-absorption) as well as different conformational analysis methods (NMR, Circular Dichroism).

Publications:

J. Am. Chem. Soc., 138, 8007–8018, 2016; *Biophys. J.*, 111, 2450-2459, 2016; *Biochim. Biophys. Acta-Biomembr.* 1848, 134-144, 2015; *J. Pept. Sci.* 20, 547-553, 2014; *Biopolymers (Pept. Sci.)* 100, 621-636, 2013.

Collaborations/Network:

University of Innsbruck, Austria – Institute of Biochemistry (Prof. R. Schneider)

University of Sibiu, Romania – Faculty of Agricultural Sciences, Food Industry and Environmental Protection (Prof. S. Oancea)

Research funding: Funding: University of Padova, PRAT N° CPDA150532/15. Project title: “Innovative natural fibers functionalized with antimicrobial peptides”. 50'000 euros.