

Antibiotics and Antibiotic Resistance

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Antimicrobial photodynamic therapy as a promising tool to overcome antibiotic resistance

Carolina dos Santos Vinagreiro¹, Mario J F Calvete¹, Fabio A Schaberle², Barbara Pucelik³, Janusz M Dabrowski³, L G Arnaut¹ and Mariette M Pereira¹¹University of Coimbra Rua Larga, Portugal²Luzitin SA, Portugal³Jagiellonian University, Poland

The development of new molecular entities capable of promoting the inactivation of bacteria without developing drug resistance depends on finding alternative mechanisms of action for antibiotics. Photodynamic Inactivation of microorganisms (PDI) is emerging as an alternative to classical antibiotics because PDI is not associated with the development of microorganism resistance after treatment. This work presents new methods of synthesis of new chemical entities based on tetrapyrrolic macrocycles that can potentially target bacteria and act both as bacteriostatic and photosensitizing agents. Additionally, this work presents the fundamental photophysical assessment of the new photosensitizers, namely in terms of their electronic absorptions, singlet oxygen quantum yields and reactive oxygen species generation. The cytotoxicity of selected photosensitizers and its antibacterial activity assays will be presented. The presentation will discuss the future perspective of PDI as a promising approach for overcoming antibiotic resistance.

Biography

Carolina dos Santos Vinagreiro is currently a Medicinal Chemistry PhD student. In 2015, she has completed her MSc from Coimbra University under the supervision of Mariette M Pereira. She ranked first among her classmates and was awarded various prizes as the Best Student in High School (18.4/20), in BSc (17/20) and in MSc (19/20). Her outstanding performance was also remarked by Luzitin SA, which offered to pay her tuition fee and in two congresses where her oral presentation was distinguished with an award. Moreover, she is the author of 6 oral communications, 3 posters and 2 papers.

Carolina_SVinagreiro@hotmail.com

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