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New strategies to develop antibiotics for treatment of *Pseudomonas aeruginosa* and *Leishmania* infections

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The current available therapy against *Pseudomonas aeruginosa* and *Leishmania spp.* infections for the well-known diseases such as cystic fibrosis and leishmaniasis (cutaneous, mucocutaneous and visceral) is far from satisfactory. It has been reported that established infections caused by *P. aeruginosa* are notoriously difficult to treat because this bacteria is usually resistant to many broad-spectrum antibiotics commonly used in hospitals and it may also acquire resistance to these drugs. Furthermore, a similar situation has been reported for leishmaniasis a complex of diseases caused by the protozoan parasite *Leishmania* spp. in humans and dogs. In fact only a limited number of expensive drugs are available for the treatment of this disease and resistance to them is still increasing day by day in endemic regions. It is also well-known that AMPs (or antimicrobial peptides) can play a very important role in host defense against these multi-drug resistant pathogens. Hence the aim of this project is firstly to find a synthetic peptide able to target the protein-protein interaction of an essential *P. aeruginosa* protein known as PA-Fur, and secondly to create a group of new anti-leishmanial synthetic peptides derived from natural AMPs. To satisfy the targets of this double project a number of synthetic peptides were manufactured following a structure-based rational design and a selection of peptides from libraries with varying sequence composition were also synthesized. Synthetic peptides of this kind, with broad range activity and which might be produced industrially by chemical synthesis, have attracted the interest of many pharmaceutical companies as a possible new generation of antibiotics able to kill highly resistant pathogens. At present they have a realistic potential for overcoming the growing problems of antibiotic resistance.

Biography

Alessandra Piccitto is a registered Pharmacist in the United Kingdom. She received her MPharm degree from the University of Turin (Italy) after completing a research project at Durham University Department of Chemistry (UK) in 2010. She has been teaching Human Anatomy, Physiology and Pathology at IIS Q. Sella of Biella (Italy). She is member of the General Pharmaceutical Council (GPhC) since 2013 and member of the Royal Pharmaceutical Society of Great Britain based in London since 2014. She published her research work entitled *"New Strategies to develop Antibiotics for treatment of P. aeruginosa and Leishmania spp. infections"* for the category of biochemistry and biophysics, one book (ISBN 978-3-659-48170-3) of 72 pages in English language, on Amazon at International Editor – Lambert Publishing Academic House in Germany in 2013. She is now working on a research project financed by the Italian Ministry of University and Research at Politecnico di Torino, Turin (Italy) that focuses on the design of scaffolds and their functionalization with peptides or proteins for myocardial tissue engineering and in general regenerative medicine.

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