Cystein-functionalization of an Antimicrobial Peptide Allows the Spontaneous Formation of a Dimer with a 30-fold Enhanced Antimicrobial Activity **A Thamri** <*amal.thamri@iaf.inrs.ca*>, **M Letourneau**, **D Chatenet**, **A Castonguay** and **J Perreault**, Université du Québec.

The development of new antibiotics and novel strategy are critically needed to overcome the problems associated with drug resistance. Cationic antimicrobial peptides (CAMPs) appear as a promising class of antibiotics, as they often display a broad spectrum of antimicrobial activity as well as a rapid bactericidal effect. Herein, we present some preliminary results obtained in the course of a study aiming at the development of convenient tools to enhance CAMPs' antimicrobial activity further, while retaining their antibiofilm effect.
We found that the introduction of a cystein residue to the N-terminal position of the 9 amino acid peptide 1037 (de la Fuente-Núñez et al., 2012) allowed the facile synthesis of a dimer via the formation of a disulfide bond. This de novo dimer displays a high antimicrobial activity against *Pseudomonas aeruginosa (ATCC 27853)*, with a bacterial growth inhibiting ability 30 times higher than the one of peptide 1037, while retaining a comparable antibiofilm effect. In addition, the cystein-modified peptide 1037 was allowed to react with maleimide. Interestingly, this led to a peptide with an antimicrobial activity similar to the original cystein-free sequence. Taken together, our preliminary results indicate the possibility of using the cystein-modification of short-sequence CAMPs as a tool to allow the low-cost formation of CAMPs with relatively high antimicrobial and antibiofilm activities.