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INVITED SPEAKER 01

Bioengineering applied to gastric cancer management

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Gastric cancer remains the 5th most common cancer worldwide and the 3rd deadliest. It was recently estimated that 89% of all gastric cancers are linked to *Helicobacter pylori* infection and, consequently, *H. pylori* eradication would allow reducing the burden of gastric cancer.The available treatment for *H. pylori* eradication relies on long time antibiotherapy, which combines at least two antibiotics (clarithromycin plus amoxicillin or metronidazole) and an acid-suppressive drug (e.g. proton pump inhibitor). This therapeutic scheme besides failing in around 20% of the infected patients, also presents several antibiotics-associated secondary effects, such as development of bacterial resistance and dysbiosis (destruction/unbalance of normal healthy gut microbiota). In fact and according to the World Health Organization, *H. pylor*i is one of the 16 antibiotic-resistant bacteria that pose the greatest threat to human health. Therefore it is essential to develop novel antibiotics or strategies to eradicate this gastric pathogen.
Over the last years, allying Bioengineering to the use of non-antibiotic derived compounds, our group has developed several innovative strategies aiming *H. pylori* eradication, with particular emphasis to the use of *H. pylori* specific glycosylated receptors immobilized onto biomaterials, biomaterials decorated with antimicrobial peptides and lipid nanoparticles loaded with docosahexaenoic acid (DHA). These 3 strategies will be briefly highlighted to demonstrate the Bioengineering potential for gastric infection management and consequently, its role in reducing mortality/morbidity rates linked to gastric cancer.

Keywords: Biomaterials, Bioengineering, New Therapies Development