O.432. *Helicobacter pylori* prophages: screening, detection, induction and potential therapeutic use

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Helicobacter pylori is a microaerophilic bacterium that chronically infects the human gastric mucosa. Infections caused by this pathogen are difficult to treat, mainly due to the increased resistance of this species to conventional antibiotics. Therefore, it is important to develop antibiotic alternative or complementary approaches to tackle *H. pylori* infections. Bacterio(phages) have proven to be efficient antibacterial agents, however it is very difficult to isolate strictly lytic phages infecting *H. pylori*. Nevertheless, this bacterial species presents prophages in their genomes and although strictly lytic phages have been consensually preferred for phage therapy purposes, temperate prophages holds a great but an exploited potential.

In the present work, we developed a new PCR-based screening method to detect the presence of prophages genes in a set of *H. pylori* Portuguese clinical strains. The genomes of selected strains were then sequenced using a combined Illumina platform and MinION nanopore-based sequencing strategy. Prophages' content was then analysed using the PHASTER tool. After sequencing analysis, UV light was used to induce phages, from which one was further characterized in terms of morphology, host range, stability on an *in vitro* gastric model, genome analysis and efficacy against a *H. pylori* culture.

The complementarity between Illumina and Nanopore results, allowed us to identify a total of 10 intact, 7 questionable and 47 incomplete prophages on the 14 sequenced strains. One predicted intact prophage was induced successfully, and presents a genome length of 31 162 bp with 37.1 % G+C content. Interestingly, this new podovirus infects five *H. pylori* strains, and in the gastric *in vitro* model only a small loss of phage titer was observed in the gastric phase, suggesting that this phage could be adapted to the stomach environment. Farther, this phage demonstrated to be capable of maintaining the *H. pylori* population at low levels for up to 24 h post-infection with MOIs of 0.01, 0.1 and 1.

Overall, a new PCR screening method was developed to detect prophages on *H. pylori* and positive correlations with sequencing results were observed. Moreover, this new isolated phage seems to have therapeutic potential to treat *H. pylori* gastric infections.

Funding: This work was supported by the Portuguese Foundation for Science and Technology – Fundação para a Ciência e Tecnologia (FCT) under the scope of the strategic funding of UIDB/04469/2020 unit, and Project PTDC/SAU-PUB/29182/2017 [POCI-01-0145-FEDER-029182]. Rute Ferreira is recipient of a FCT PhD grant with the reference SFRH/BD/146496/2019.