Figure S1. Overview of the genomes of the *P. aeruginosa* phages used in this research.

The arrows indicate the open reading frames (ORF): Black arrows refer to structural proteins, grey arrows to proteins with a predicted or known function, white arrows to hypothetical proteins of unknown function, green arrows to proteins identified in this work and red arrows to proteins identified in this work and with an inhibitory effect on growth of *P. aeruginosa*. The numbers indicate the corresponding gene product number of the marked proteins.

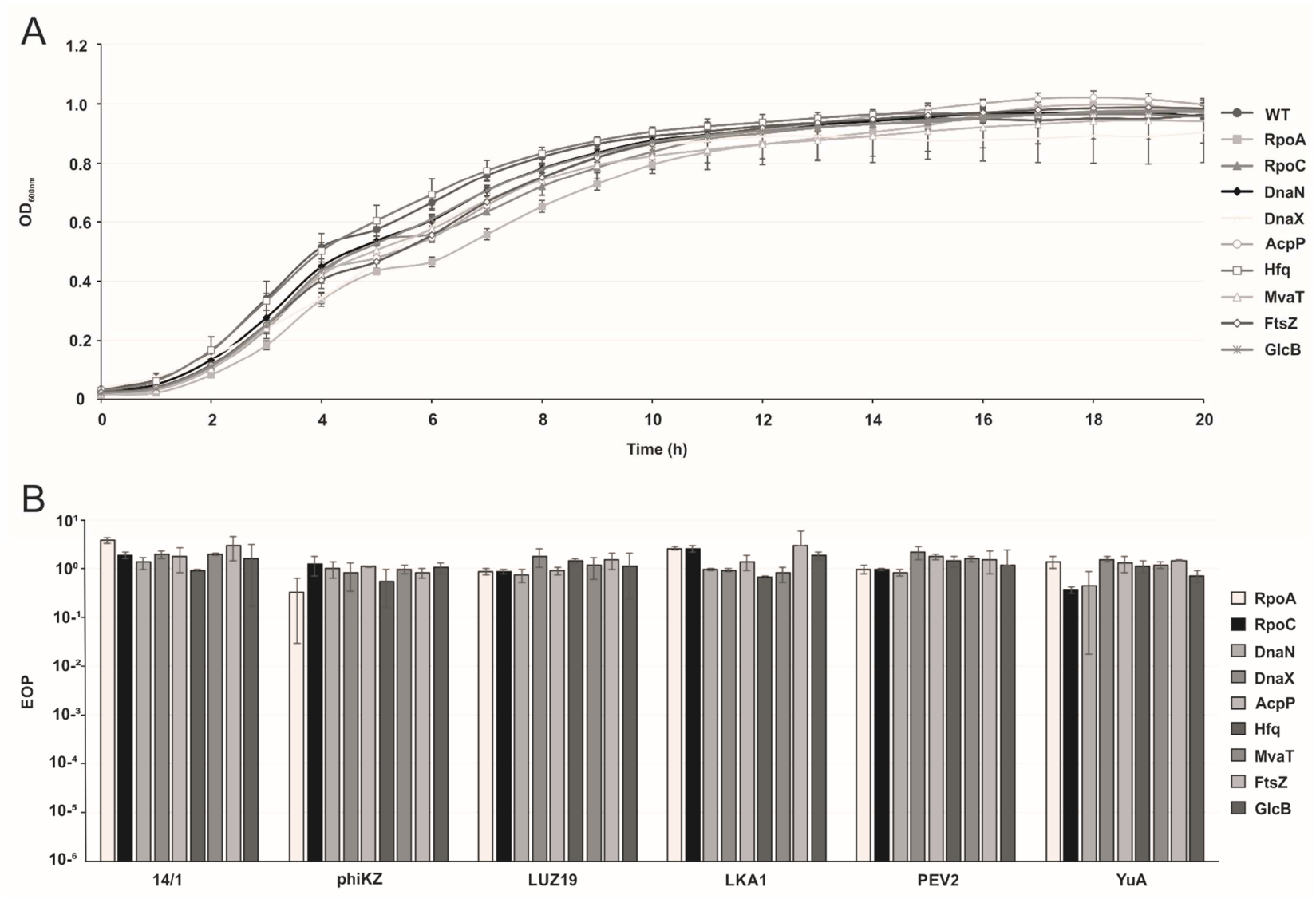

Figure S2. Characterization of the growth and infection parameters of the engineered *P. aeruginosa* strains.

A. Optical density (OD_{600nm}) in function of time of all constructed *P. aeruginosa* strains. WT is referring to the wild type PAO1 strain. For the other strains, the tagged target protein is indicated. **B.** Efficiency of plating (EOP) of six phages on the engineered strains. The EOP is determined by the ratio of the number of plaques on the mutant strain to the number of plaques on the wild type strain. Error bars represent SD.

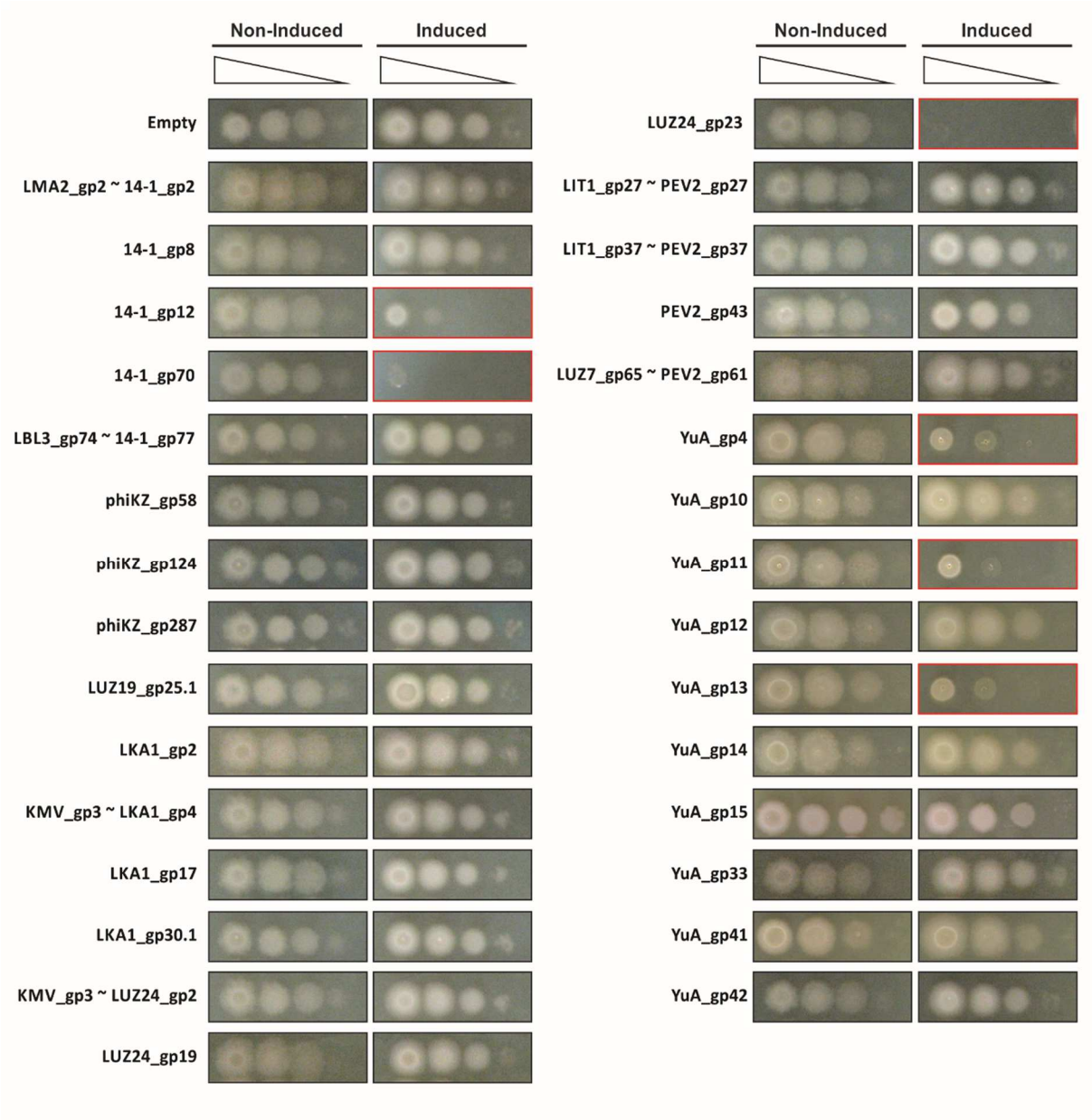

Figure S3. The expression of the identified phage proteins in *P. aeruginosa*.

The expression of all (cloned) phage proteins (or a perfectly conserved homologue) in wild type *P. aeruginosa* cells. Growth was visualized by spotting dilution series on solid medium. Proteins with an inhibitory effect are marked with red boxes.

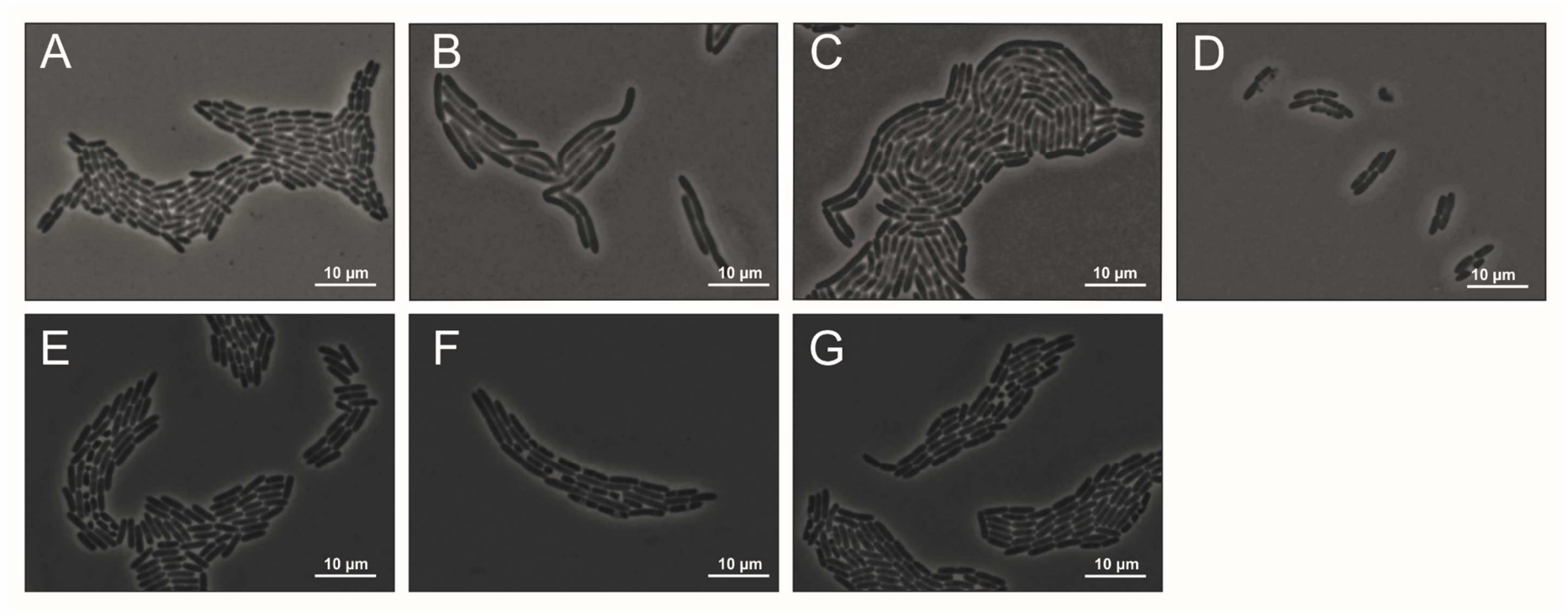

Figure S4. The expression of inhibitory phage proteins in wild type *P. aeruginosa* cells.

A snapshot was taken 5h after induction using a Nikon Eclipse Ti Time-Lapse Microscope. **A.** Wild type cells. **B.** gp23 of LUZ24 expression resulted in filamentary growth. **C.** gp12 of 14/1 expression resulted in small filamentary growth. **D.** gp70 of 14/1 expression resulted in cell death after one cell division. **E.** gp4 of YuA expression resulted in cell death for a fraction of the cells. **F.** gp11 of YuA expression resulted in filamentary cell growth followed by cell death. **G.** gp13 of YuA resulted in cell death for a fraction of the cells.

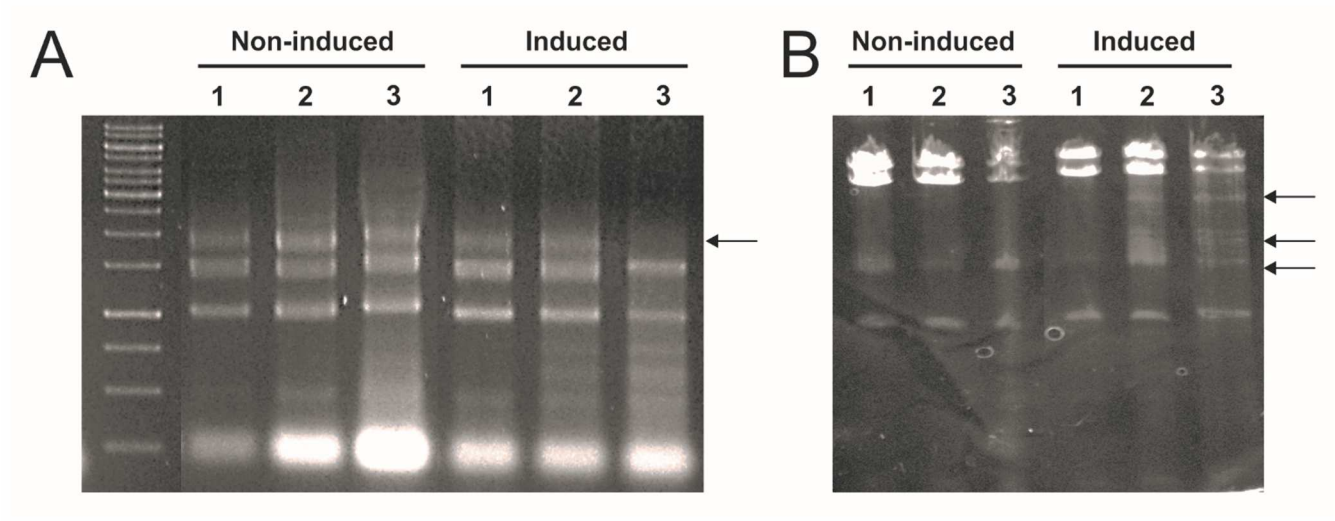

Figure S5. RNA extraction from *P. aeruginosa* cells expressing of gp70 of phage 14-1.

RNA was extracted by the use of TRIzol® reagent [23] in early exponential (1), late exponential (2) and stationary (3) growth phase of induced and non-induced cells. 4 µg RNA was loaded on (**A.**) a denaturing 7 M urea 8% (w/v) polyacrylamide gel and (**B.**) a 1% agarose gel. The arrows indicate differences between non-induced and induced cells.

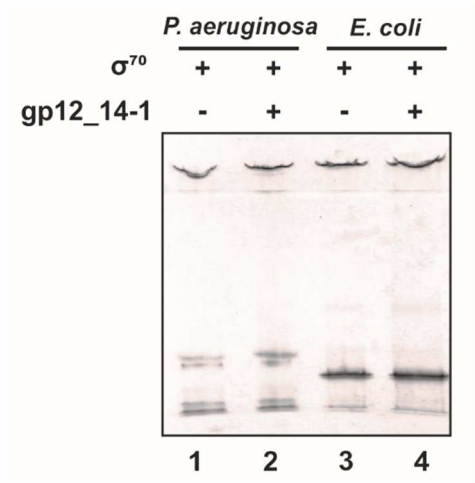

Figure S6. Native gel mobility assay on gp12 and σ^{70}

A native gel mobility assay using *P. aeruginosa* (Lane 1-2) or *E. coli* (Lane 3-4) σ^{70} without (Lane 1-3) or with (Lane 2-4) protein gp12 of phage 14/1.