

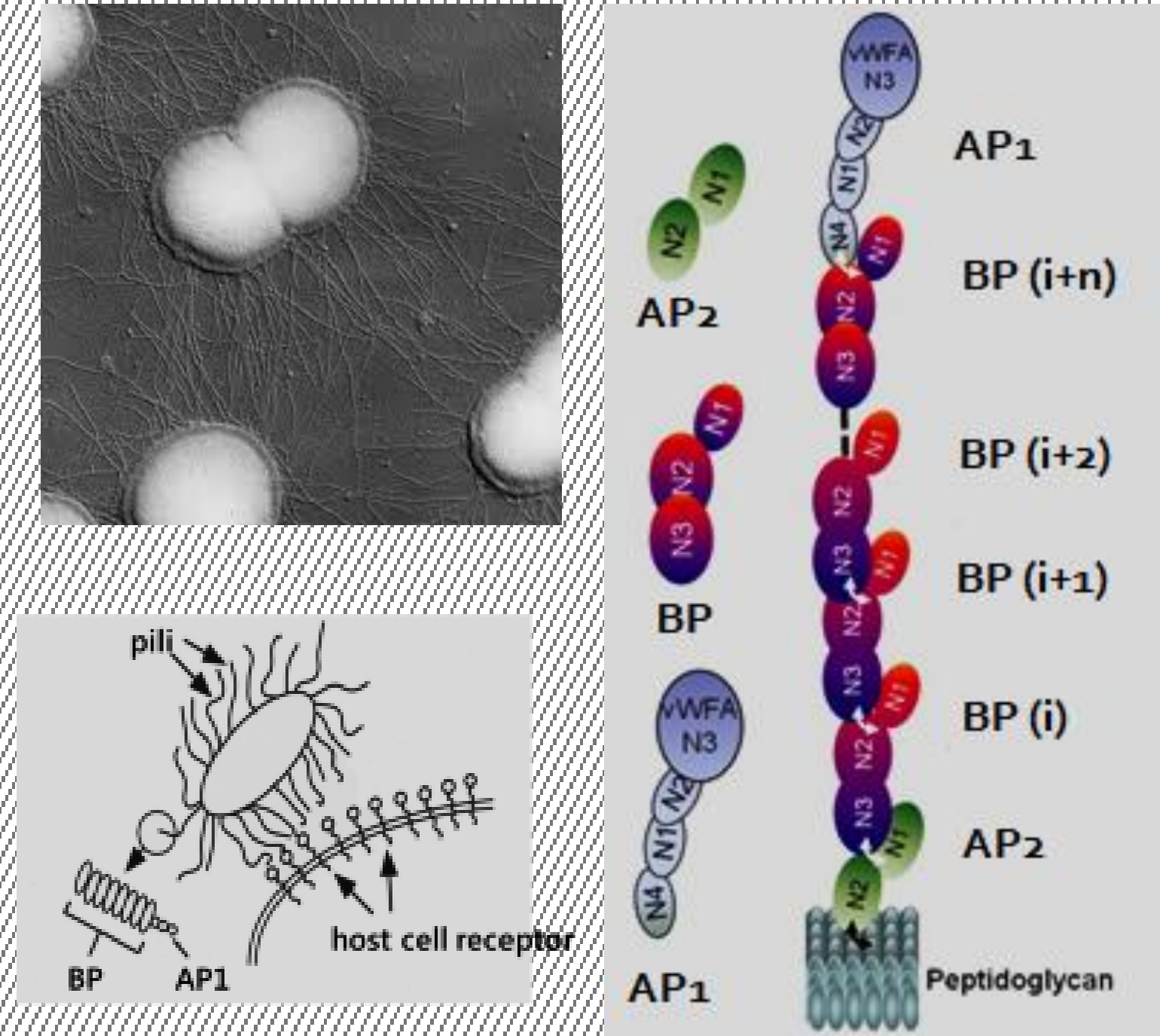
Pilus Structure from M2 Serotype *Streptococcus pyogenes* is Important for both Cell Adhesion and Immune Evasion

Catherine Jia-Yun Tsai¹, Jacelyn Loh¹, and Thomas Profft¹

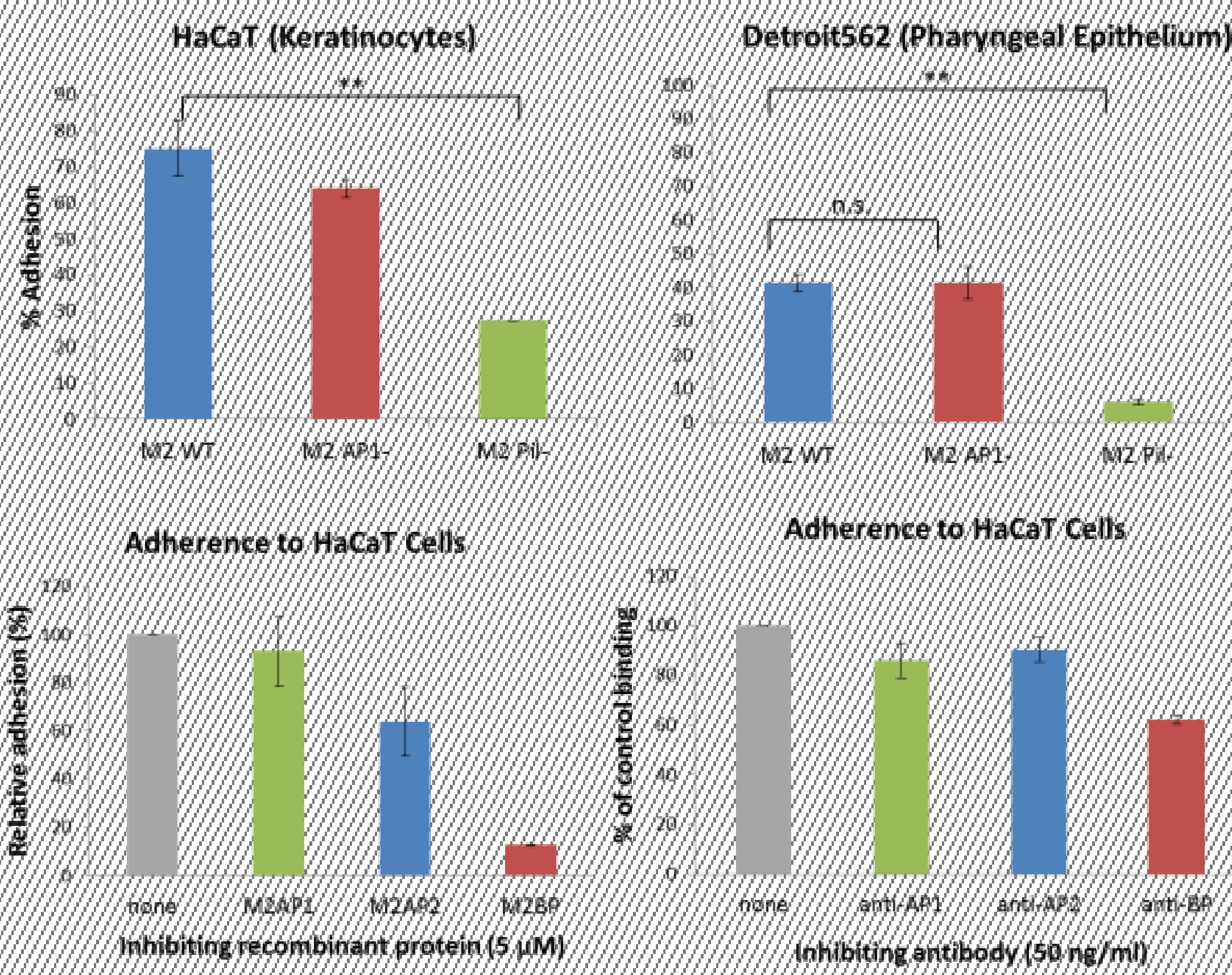
¹ School of Medical Sciences and Maurice Wilkins Centre, University of Auckland, Auckland, New Zealand



The various pili structures found in *Streptococcus pyogenes* (group A streptococcus) have been shown to mediate host cell adhesion and biofilm formation, but the exact function of many variants are still unknown. The aim of this study is to characterize the pilus found in serotype M2 strains, which shows low sequence homology to other better studied GAS pili. Using bioluminescent pilus deletion GAS mutants and surrogate *Lactococcus lactis* expressing M2 pilus, we demonstrated the roles of the M2 pilus in host cell adhesion and immune evasion. These characteristics further confirm the importance of pili in GAS pathogenesis.

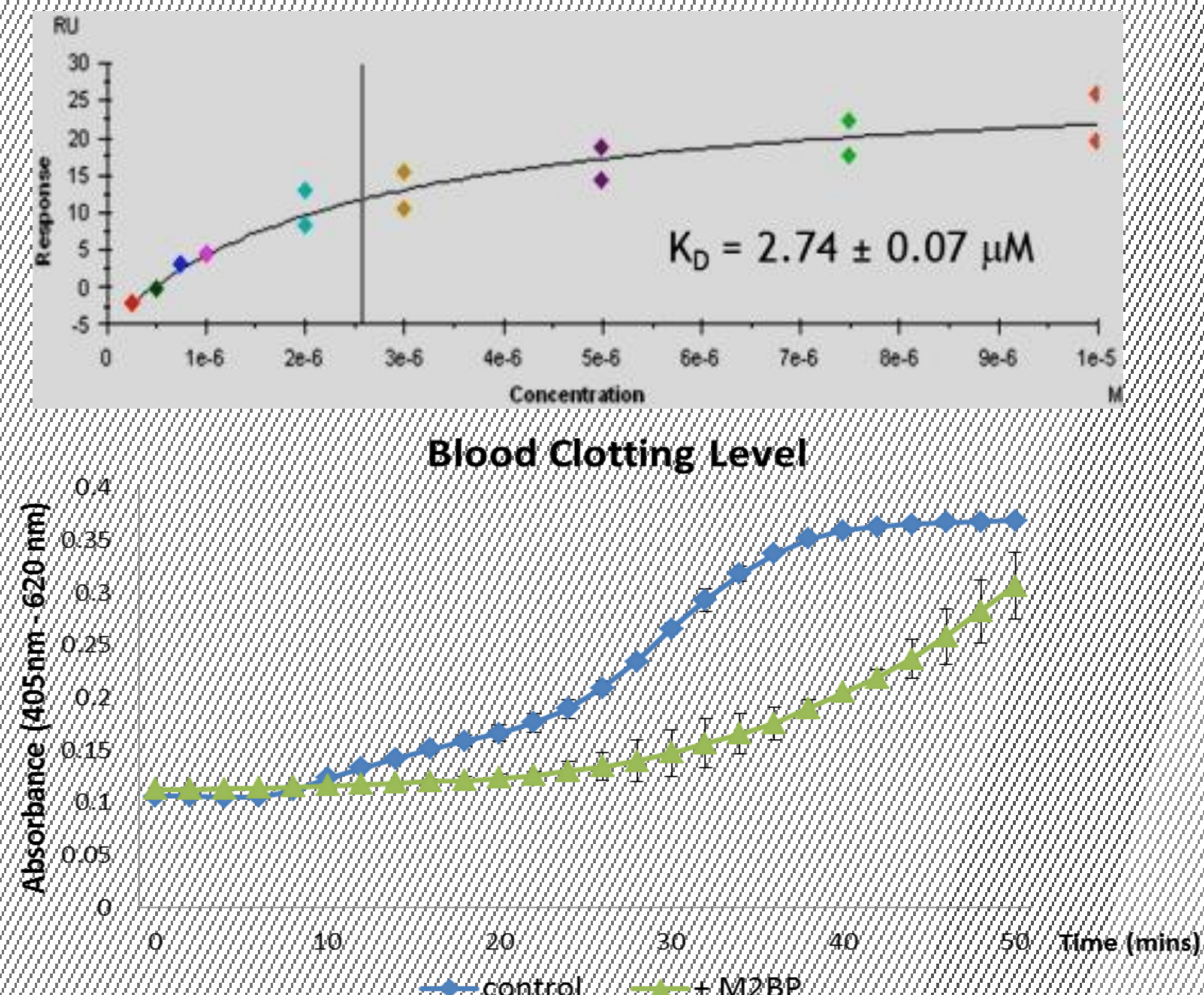


M2 Pilus mediates cell adhesion



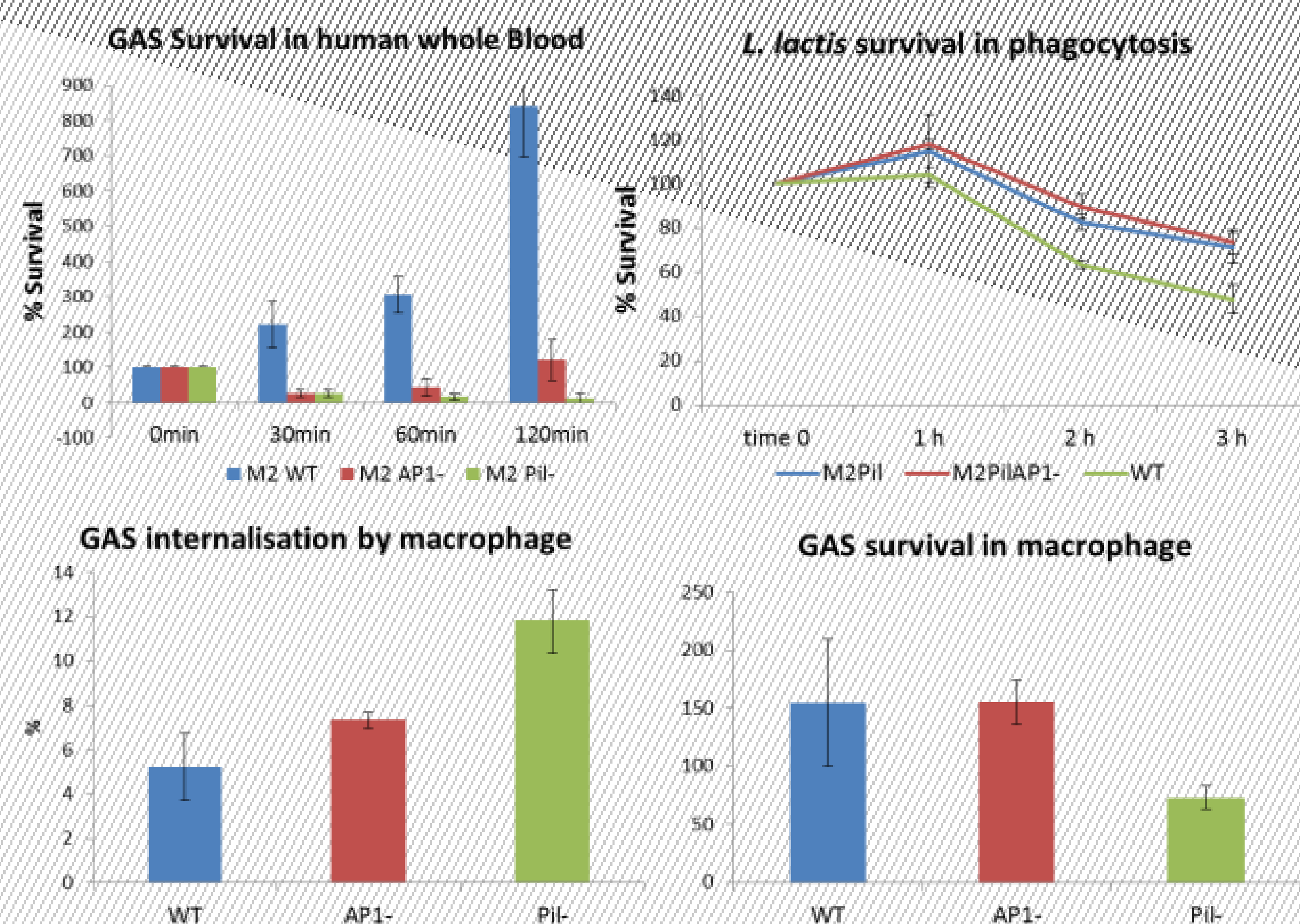
The M2 pilus is important for GAS binding to the two epithelial cell lines tested. However the backbone pilin (BP), but not the tip adhesin (AP1) seems to be more important for adhesion.

M2 BP adheres to fibrinogen



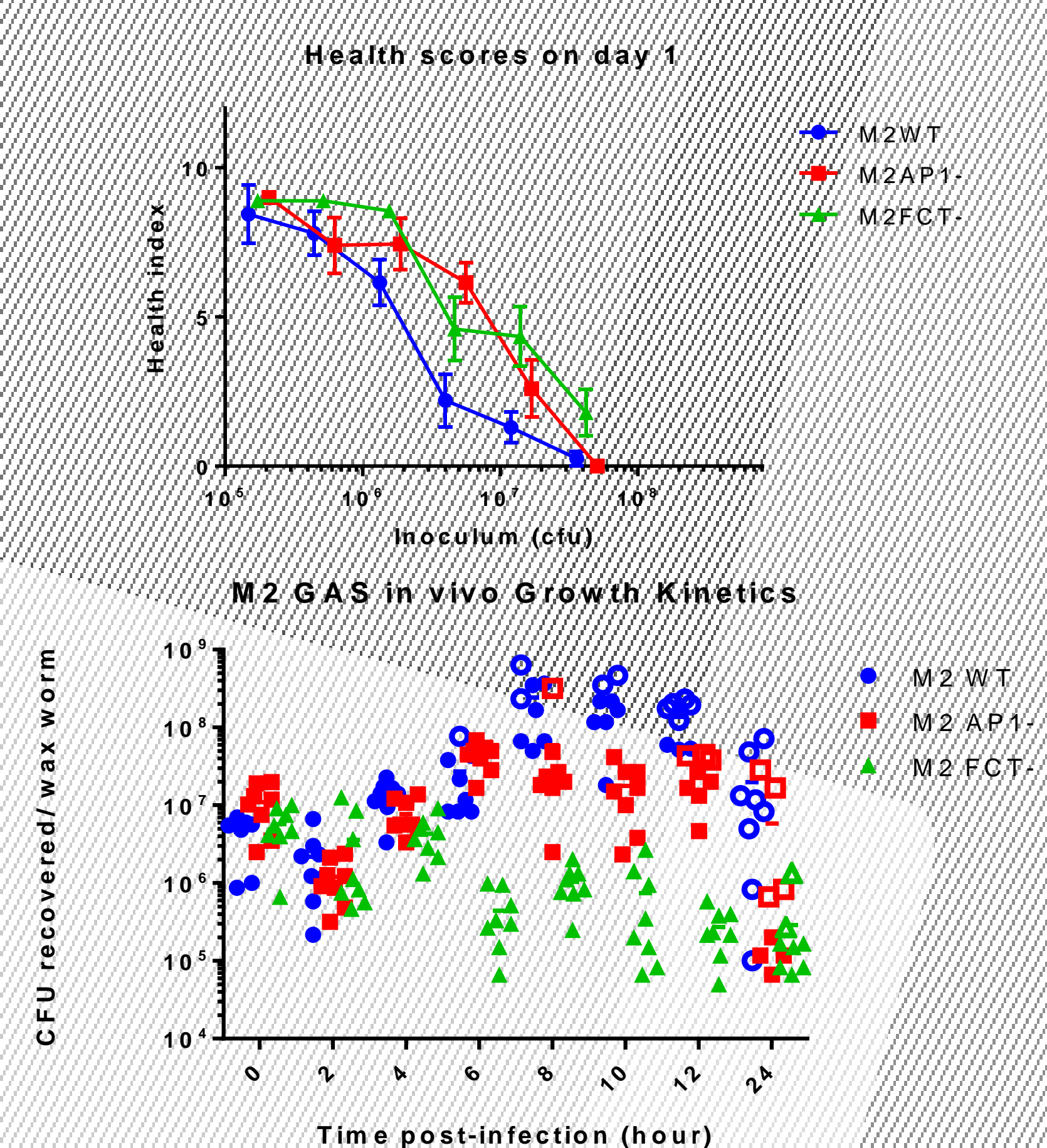
Pull-down assays and ELISA identified fibrinogen (Fg) as ligand for BP, and the binding affinity was determined by surface plasmon resonance. Fg binding may contribute to the delayed coagulation effect of BP observed in a blood clotting assay.

M2 Pilus confers protection for GAS



The M2 pilus conferred protection for GAS in whole blood killing assay and macrophage phagocytosis assay. This protection might be due to resistance to both macrophage uptake and intracellular killing.

M2 Pilus is a virulence factor



The virulence of the M2 pilus was demonstrated in a wax worm infection model. Expression of the pilus correlated well with lower health scores of the animals and better *in vivo* survival.