RES-102

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Effect of Iron on the Growth, Motility, and Biofilm Formation of *Burkholderia pseudomallei* isolated from Humans and Animals

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Introduction

Burkholderia pseudomallei is the causative agent of melioidosis, commonly found in tropical countries including Southeast Asia and northern Australia. Environmental factors, such as iron availability may influence the bacterium's survival and adaptive responses. In this study, we investigated the adaptive changes in *B. pseudomallei* isolates that were obtained from human clinical and animal samples in Thailand.

Methods

Burkholderia pseudomallei (*Bp*)

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Human (H1, H4), Pig organs (O2, O3) and the reference strain, K96243

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Cultured in LB medium containing iron (0, 100, 300, 500 mM $FeSO_4$) at 37°C for 18 h

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Iron-treated and untreated *B. pseudomallei* were adjusted to an OD_{600} of 0.15 (10^8 CFU/ml)

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- Growth curve analysis (over a period of 72 h)
- Motility assay Swarm plate method
- Biofilm formation (Microtiter plate assay)

Results

Effect of iron on the growth rate of *B. pseudomallei*

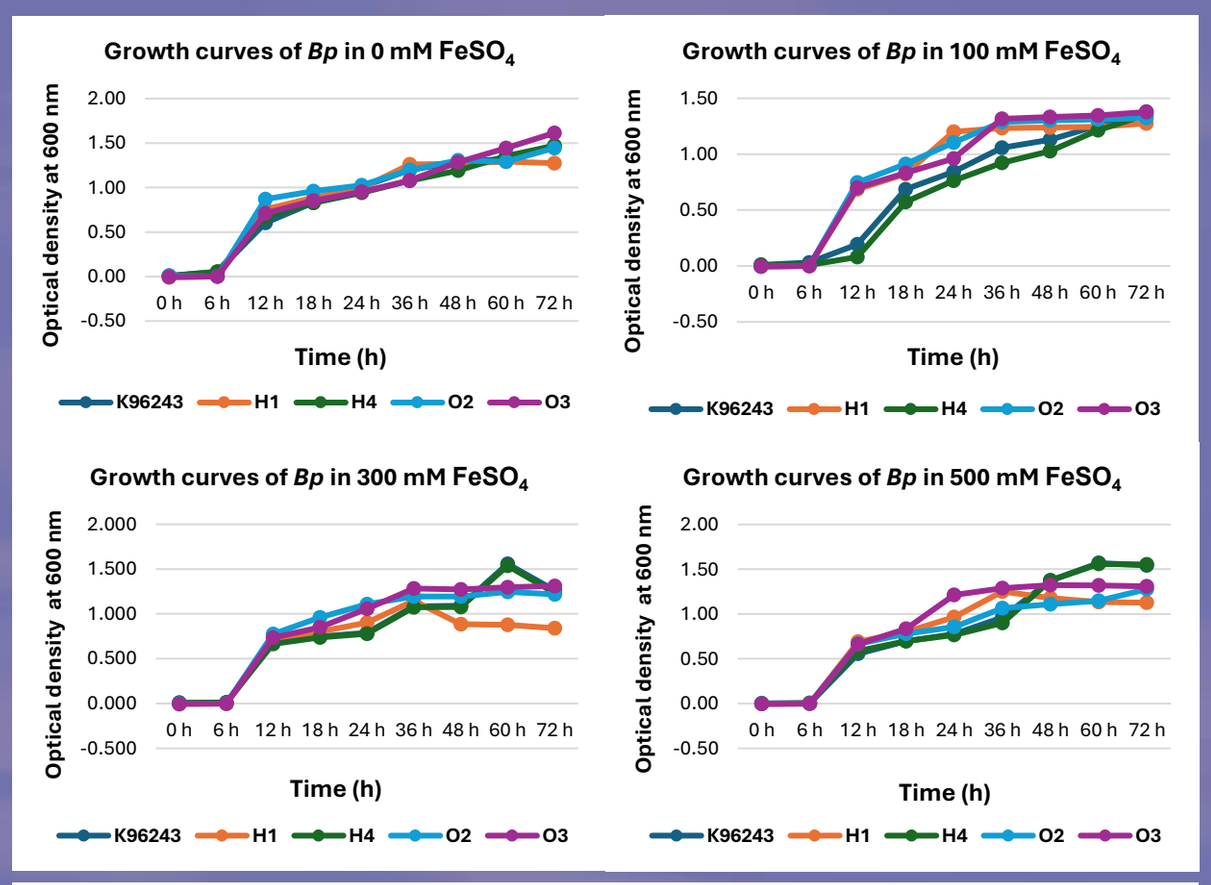
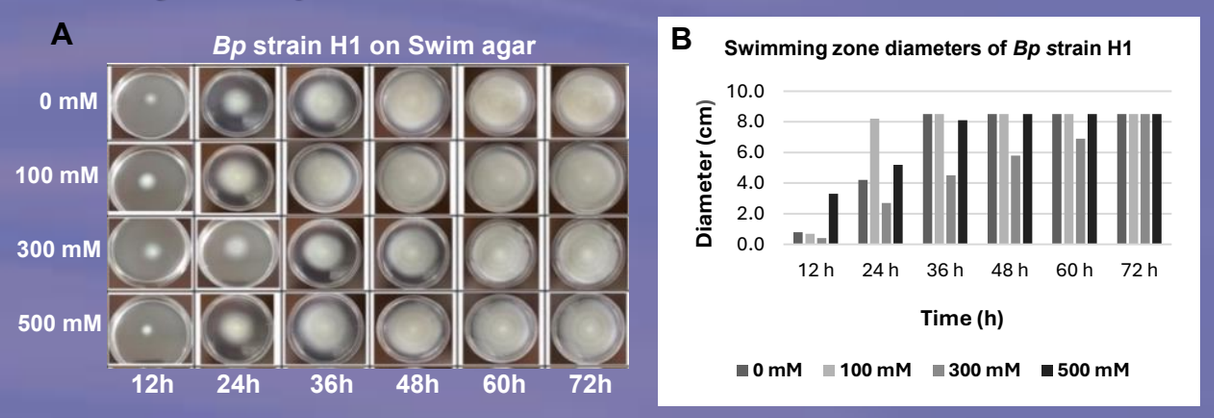


Figure 1. Growth curves of *Bp* strains in LB broth with 0, 100, 300, 500 mM $FeSO_4$. ***B. pseudomallei* isolates exhibited the similar growth rate at 37 °C for 18 to 24 h.**

Motility of *B. pseudomallei* in different iron concentrations



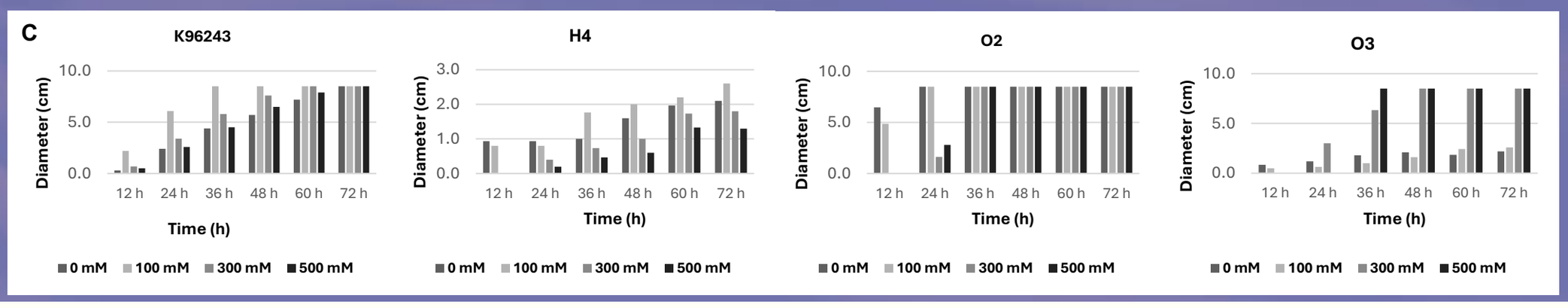


Figure 2. Swimming zone diameters of *Bp* after incubation in iron concentrations between 12 and 72 h. (**A**) Swimming zones of *Bp* strain H1, (**B**) Swimming zone diameters of *Bp* strain H1, (**C**) Swimming zone diameters of *Bp* strains K96243, H4, O2 and O3. **Bacterial motility was positively affected under conditions with iron. Most of *B. pseudomallei* isolates increased motility when grown in the presence of 100 mM $FeSO_4$.**

Effect of iron on *B. pseudomallei* biofilm formation

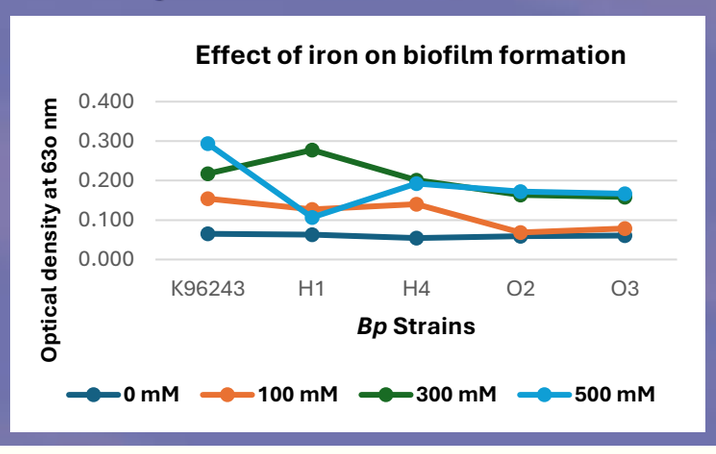


Figure 3. Biofilm formation of *Bp* strains in LB broth with 0, 100, 300, 500 mM $FeSO_4$. **Biofilm formation capacity of each *B. pseudomallei* isolate increased when grown in the presence of 0, 100, 300 and 500 mM $FeSO_4$, respectively.**

Conclusion

These findings indicate that iron contributes to the survival of *B. pseudomallei* and enhances its ability to adapt in the environment. This may also play a role in the transmission and infection of melioidosis.

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References

Paksanont S, Sintiprungrat K, Yimthin T, Pumirat P, Peacock SJ, Chantratita N. Effect of temperature on *Burkholderia pseudomallei* growth, proteomic changes, motility and resistance to stress environments. Sci Rep. 2018 Jun 15;8(1):9167.

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