It's Moving Day!
Assessing Motility in K. pneumoniae

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BACKGROUND

- *Klebsiella pneumoniae* is a widely prevalent, antibiotic resistant bacterium with large clinical significance. Yet, *K. pneumoniae's* ability to cause severe disease is poorly understood.
- Motility, bacteria's ability to move independently, enables bacteria to find resources and colonize new areas.[1]
- *K. pneumoniae* is generally known as non-motile, but recent studies provide evidence of structures similar to flagella[2] and pili[3] that present potential for swimming and twitching motility.

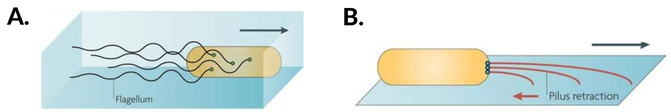

Figure 1. A. Swimming motility mediated by flagella in a liquid environment. **B. Twitching motility** mediated by type IV pili on a solid surface. Figure from Kearns, 2010.[4]

OBJECTIVE

I determined the presence of swimming and twitching motility in *K. pneumoniae* clinical isolates.

METHODS

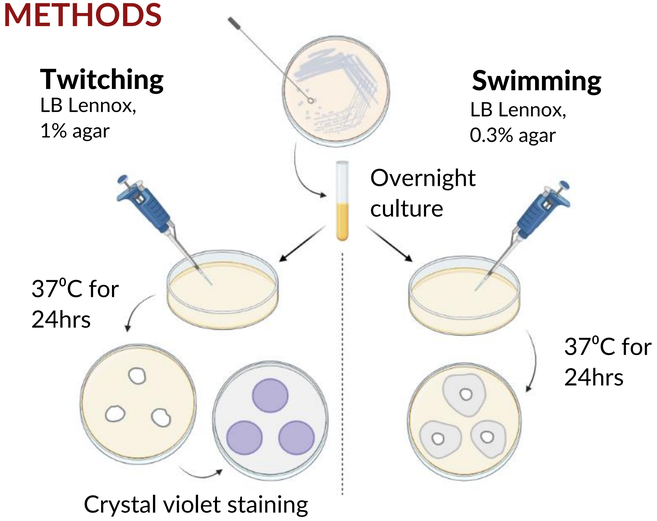

Figure 2. *K. pneumoniae* clinical isolates were collected from patients at BC Children's and Women's Hospital. These isolates are from various infections and have diverse multidrug resistance. Motility assays were performed and diameters were measured.

K. pneumoniae clinical isolates exhibit **swimming motility.**

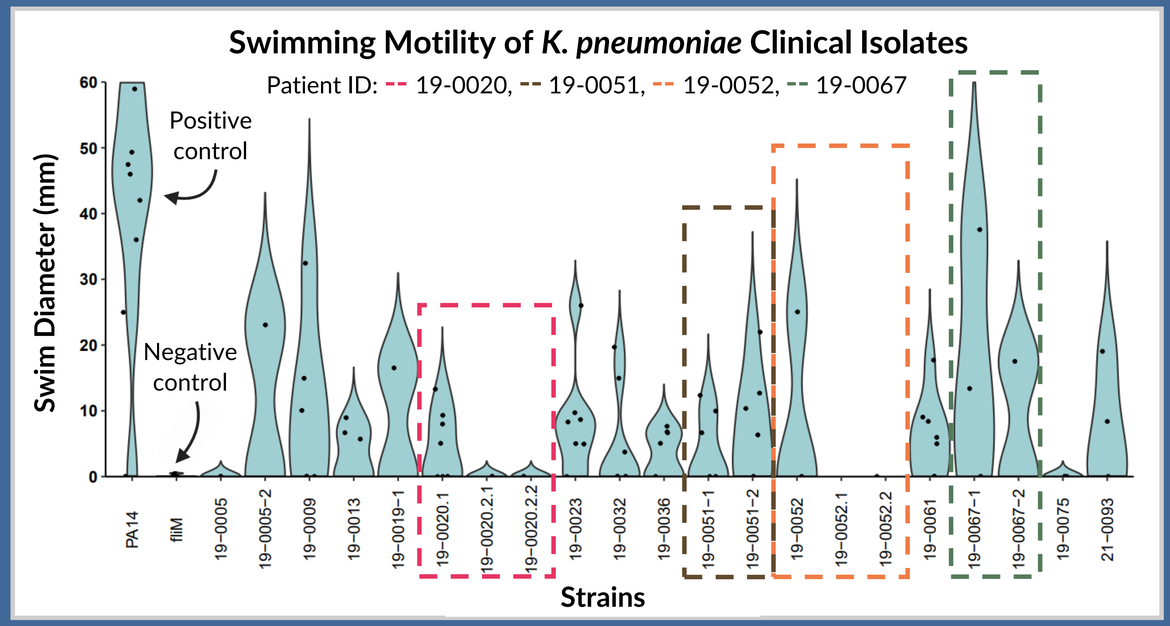

Figure 3. Swimming motility observed in *K. pneumoniae* clinical isolates.

- Isolates exhibit a bimodal distribution, indicating two different phenotypes of swimming vs. no swimming within one isolate.
- High variability between isolates indicates large phenotypical diversity. Different isolates from the same patient also display variability in phenotype (dashed-line boxes).

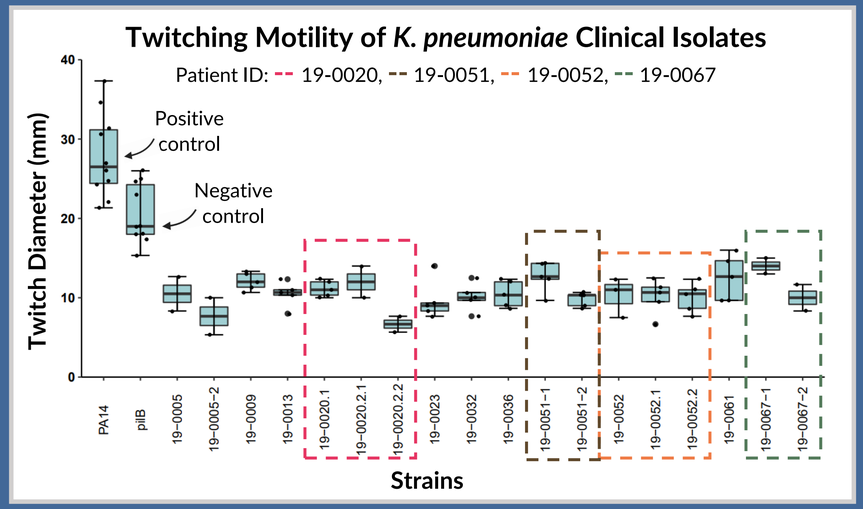

Figure 4. No twitching motility observed in *K. pneumoniae* clinical isolates.

- Twitch diameters of all isolates are significantly smaller than the positive control, indicating absence of twitching motility.

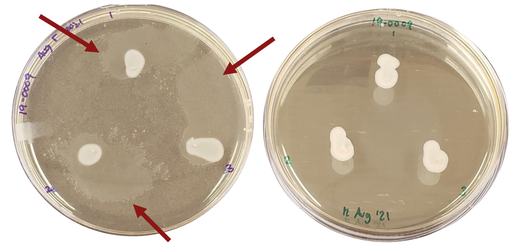

Figure 5. Swimming assay of two separate biological replicates of isolate 19-0009. One replicate exhibits swimming (left), one does not (right).

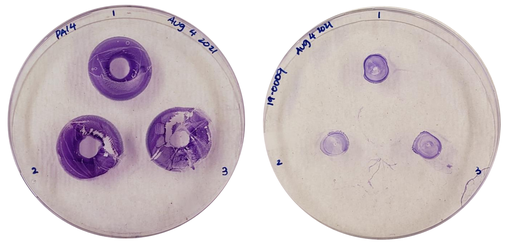

Figure 6. Twitching assay comparing positive control (left) to isolate 19-0009 (right).

CONCLUSIONS

- *K. pneumoniae* clinical isolates exhibit **large diversity in motility phenotypes.**
- The putative swimming motility displays a **bimodal distribution** in all isolates.
- Different isolates from a **single infection in one patient** display variation in motility.

REFERENCES

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