

Persistent *Listeria monocytogenes*: A Cadmium Connection?

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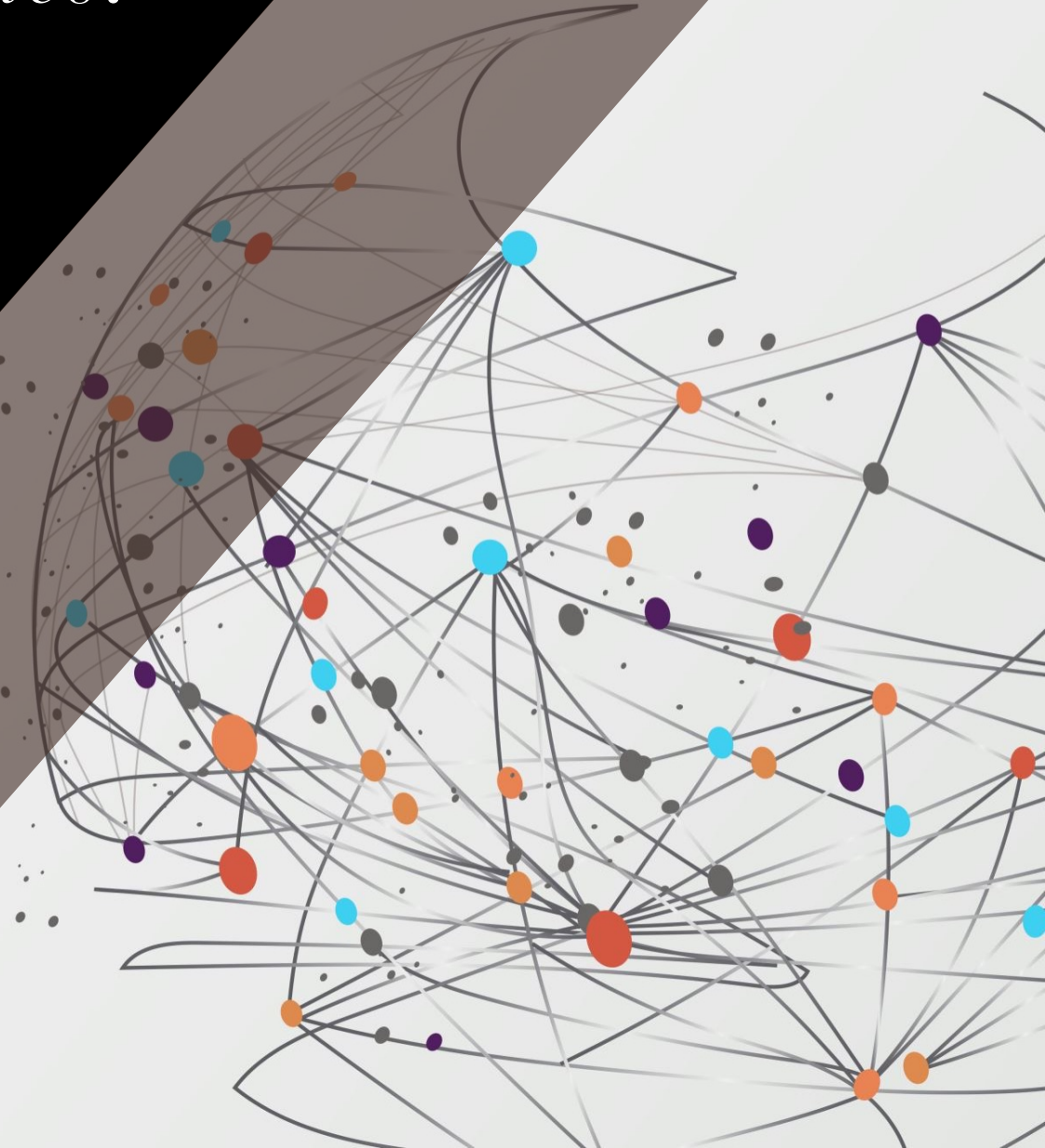
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A petri dish containing a bacterial culture on a dark agar surface. The culture shows several distinct, parallel streaks of small, white, pinpoint-sized colonies. The streaks are arranged in a somewhat grid-like pattern, with some larger, more confluent areas. The background is dark, and the petri dish is partially visible on the left side of the frame.

The 7-year *L. monocytogenes* challenge

- 130 cases of listeriosis from 2 outbreaks linked to cheese
 - No recall
 - Follow-up investigations: environmental and product sampling
 - 5 facilities sampled from 2007 to 2017
 - Facility 71 had a persistent cluster → 63 clonal isolates over 7 years
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Why was this strain persistent?

(63 clonal isolates over 7 years from 1 facility)



Were they forming biofilms?



Were they stress resistant?



Were they particularly virulent?

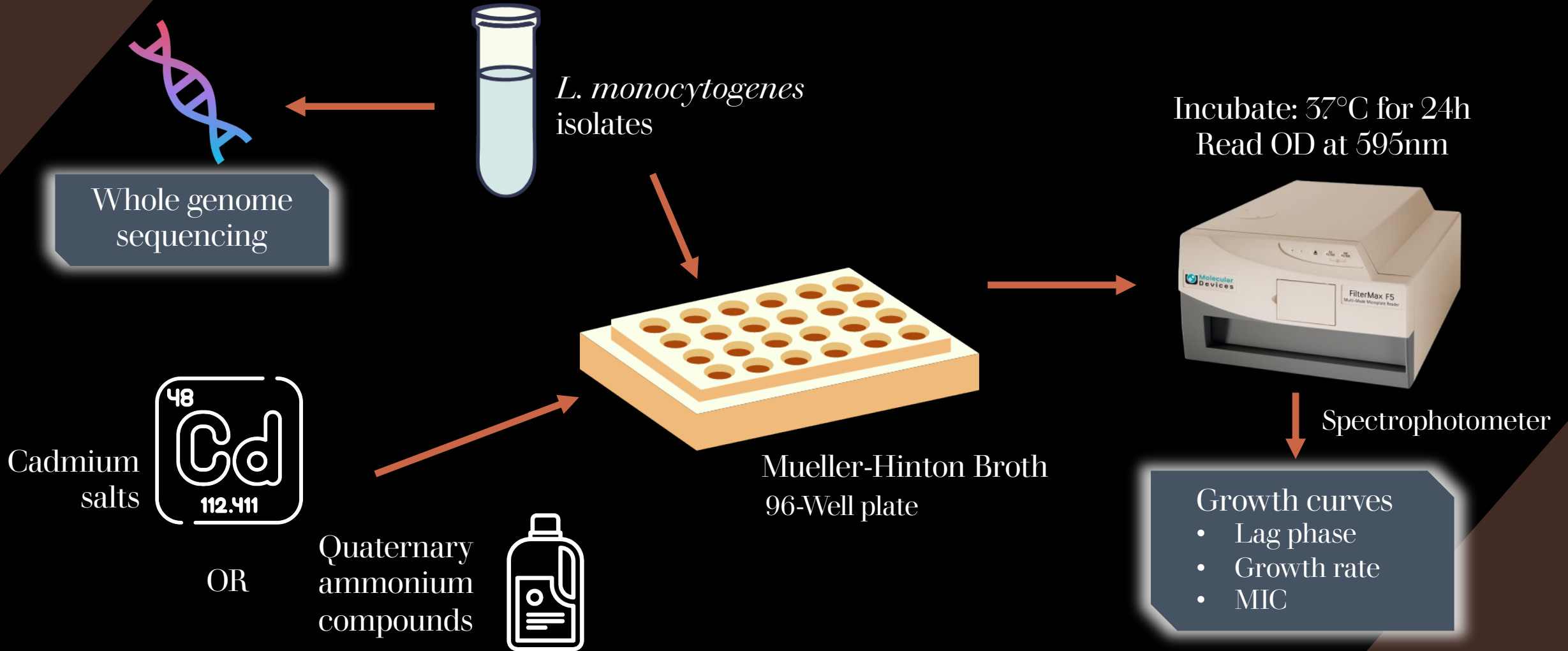


Were they sanitizer tolerant?

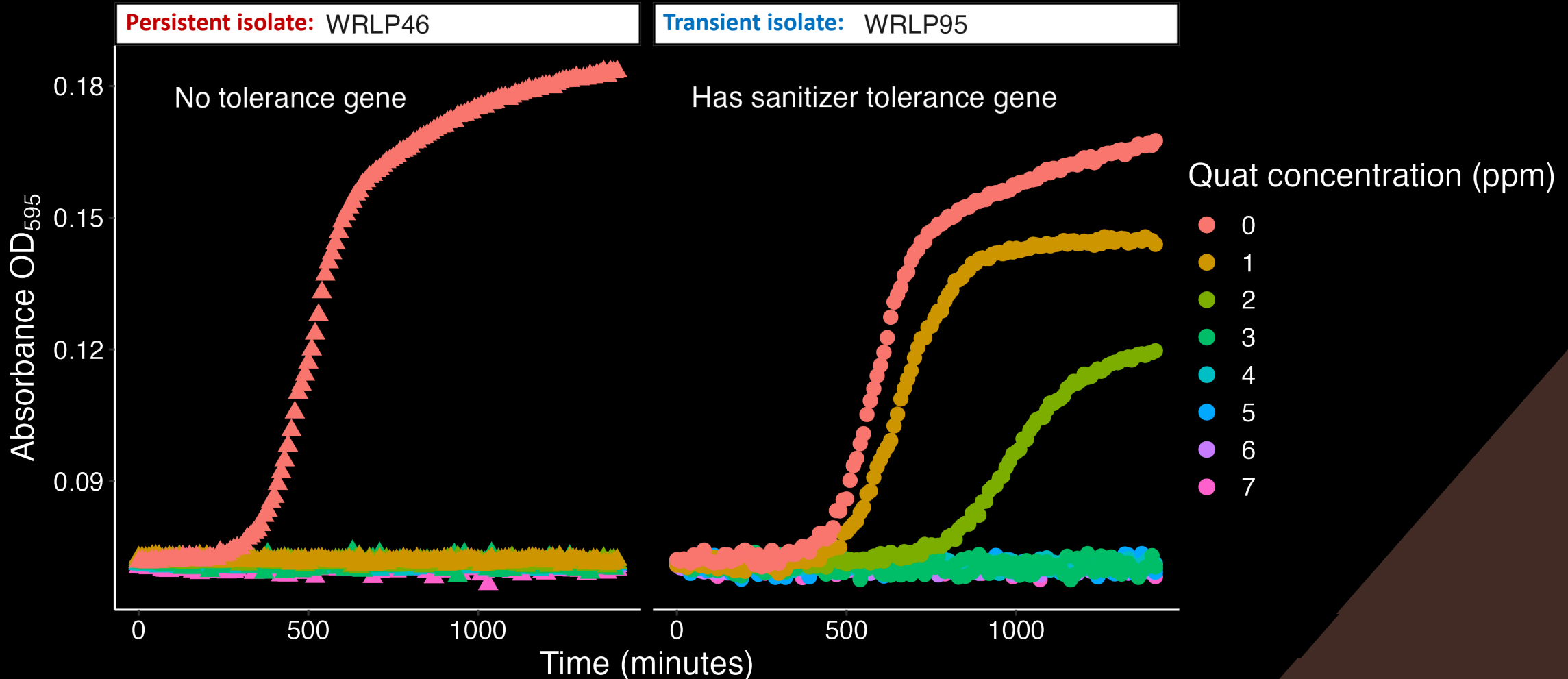


Were they resistant to heavy metals?

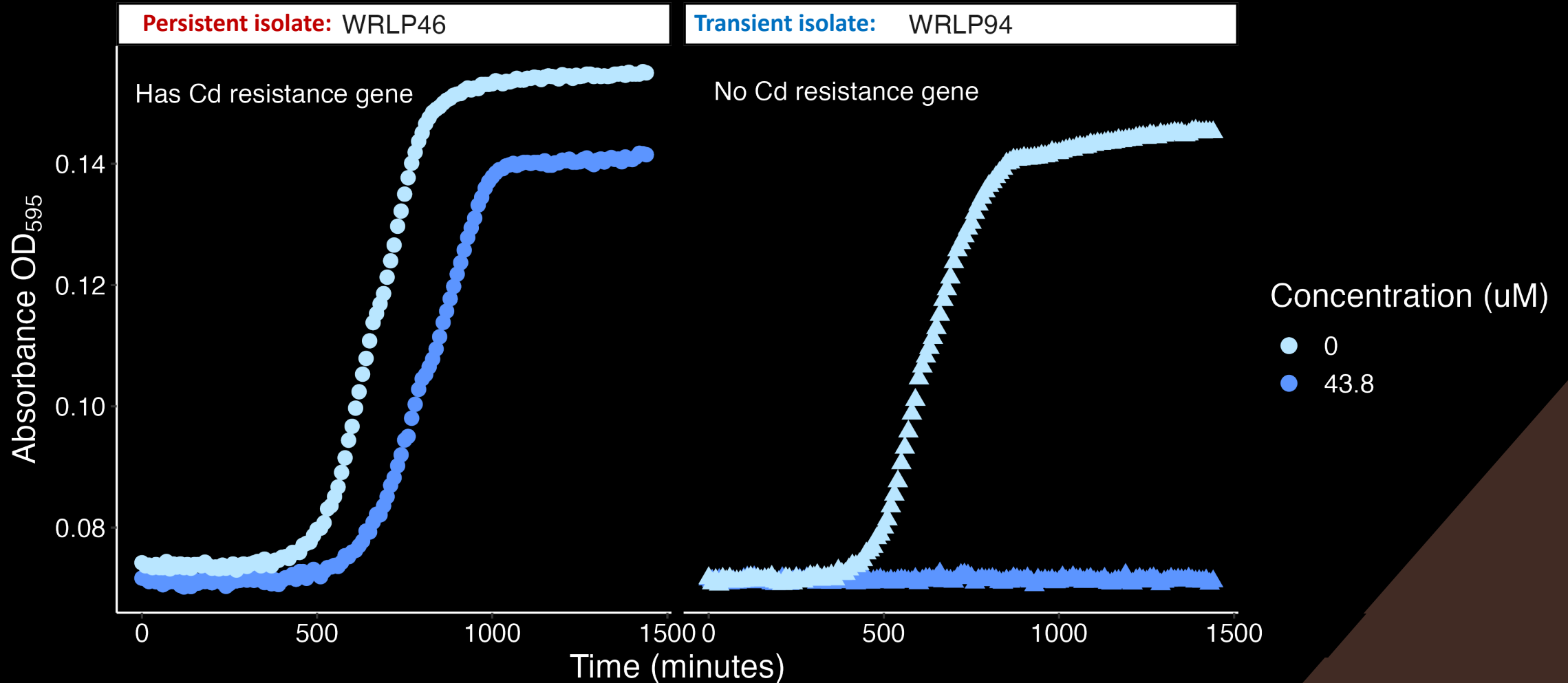
Assessing metal resistance and sanitizer tolerance



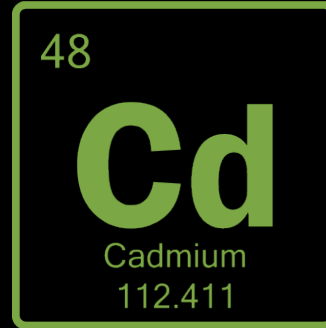
None of the persistent isolates demonstrated sanitizer tolerance.



All isolates in persistent cluster possess cadmium resistance genes.

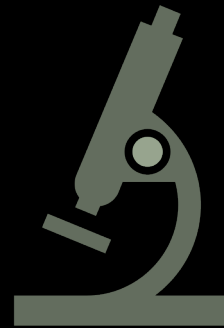


The Cost of Complacency



Cadmium resistance may be an indicator of a persistent population.

A festering niche may acquire or spread these tolerance genes.



Future work includes genomic analysis to compare mobility and acquisition of these genes.