Environmental *Legionella* and One Health

One Health defines the concept of integrating and optimizing the health of people, animals, and ecosystems. *Legionella* species are transmitted from environmental sources, and therefore, the surveillance, risk assessment, and elimination of *Legionella* in technical water sources is of great importance to reduce the number of Legionnaires' disease cases. Current projects aim at using *Acanthamoeba castellanii* amoebae and the "amoeba plate test" (1) to detect and enrich amoeba-resistant *Legionella* species in technical and environmental water samples. Moreover, the effects of temperature on growth of *Legionella* spp. are studied (2) (**Fig. 1**). In ongoing projects, we assess the effect of temperature on virulence, survival, and the induction as well as "resuscitation" of "viable-but-non-culturable" *Legionella pneumophila*.

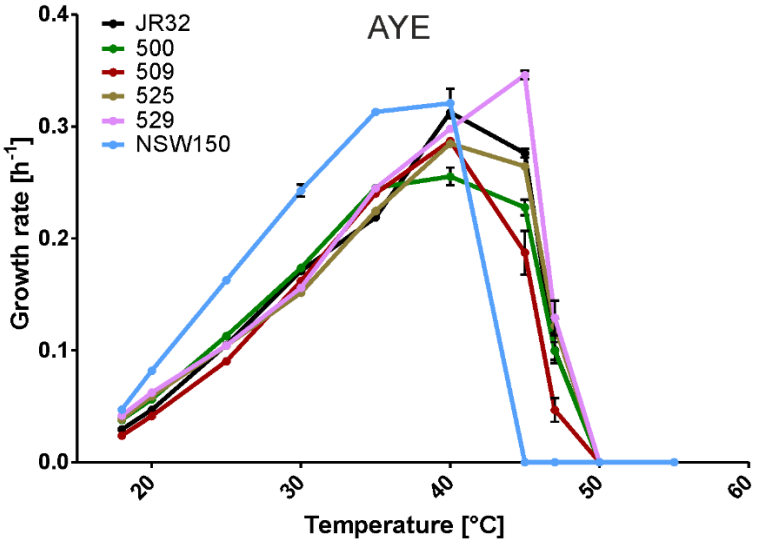

Fig. 1. Temperature-dependent growth of clinical and environmental *Legionella* isolates. *L. pneumophila* clinical and environmental strains JR32, 500, 509, 525, 529 and *L. longbeachae* strain NSW150 were diluted in AYE medium to an initial OD_{600} of 0.2 and grown at the temperatures indicated (18-55°C). Bacterial growth was determined over time by measuring OD_{600} using a microplate reader. Data shown are means and standard deviation of growth rates from three independent experiments performed in biological triplicates.

A. castellanii amoebae have also been used to identify and characterize novel, cell-permeable antibiotics (3-5). To this end, we have been using amoeba infected with fluorescently labelled *L. pneumophila* or *Mycobacterium marinum* to screen for compounds interfering with the intracellular survival and growth of the pathogens.

References

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