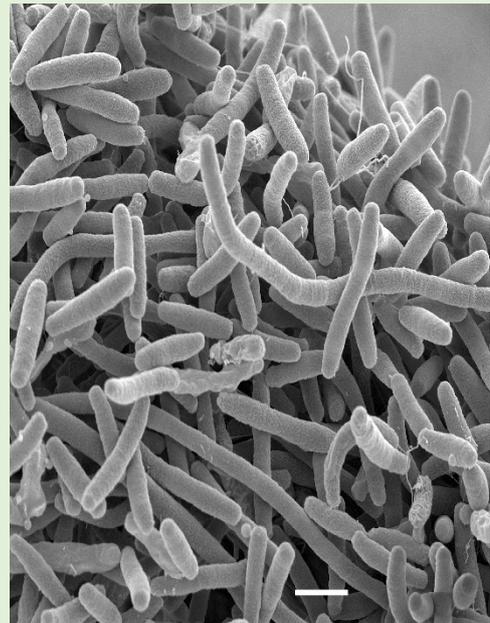


Free-living nematodes as vectors and reservoirs of *Legionella pneumophila*

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INTRODUCTION

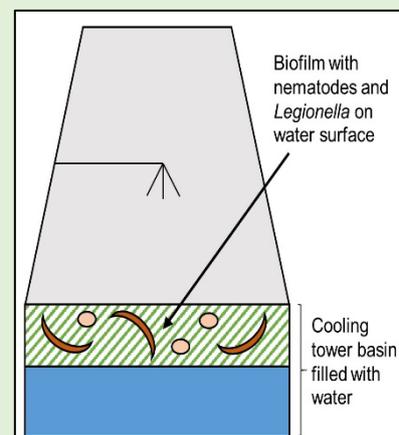
L. pneumophila, the causative agent of Legionnaires' disease, is part of the natural flora in freshwater, e.g. lakes, where it occurs in small numbers. In technical water systems with elevated temperatures (e.g. showers), however, *L. pneumophila* can multiply strongly. Recently, it has been demonstrated that several nematode taxa, which were isolated from a cooling tower, harbored *L. pneumophila*. These observations suggest that nematode taxa from aquatic habitats may serve as environmental reservoirs or vectors for *L. pneumophila*. This may represent an underestimated risk factor for the transmission of Legionnaires' disease.



L. pneumophila. Source: Norbert Bannert, Gudrun Holland/RKI

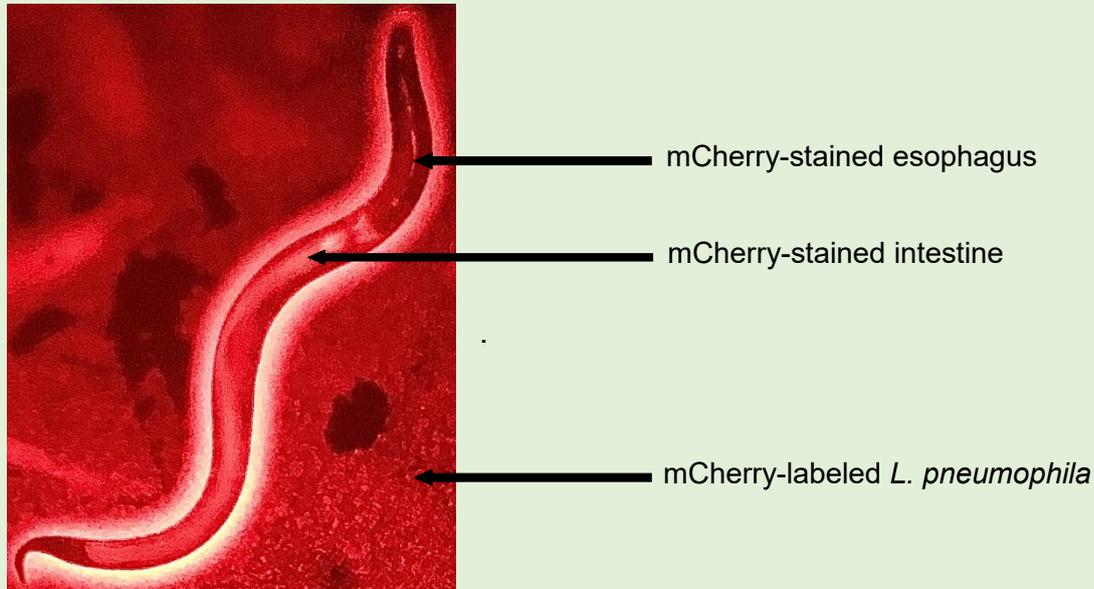
FIRST WORK

A field sampling campaign across natural (swimming lakes) and technical (shower, cooling towers) habitats was conducted. Cooling towers were identified as major environmental water bodies, where *Legionella* and nematodes co-occur. The respective dominant *L. pneumophila* strains and nematode taxa (e.g. *Plectus* sp.) were isolated and cultivated.



INGESTION OF *L. PNEUMOPHILA*

To test whether *L. pneumophila* is a possible resource for free-living nematodes, the *L. pneumophila* strain isolated from a cooling tower was labeled with mCherry and offered as food source to the nematode *Plectus* sp. found in the same cooling tower. Labeled *Legionella* and nematodes were provided by Prof. Dr. Steinert (Technische Universität Braunschweig).



OBJECTIVES

To determine the mechanisms behind the *Legionella*-nematode interactions the following research goals will be addressed:

Goal 1: *L. pneumophila* – nematode interactions: impact on pathogen survival and nematode life cycle, biomass and food choice

Goal 2: Mechanisms facilitating ingestion, colonization, and shedding of *L. pneumophila* by nematodes

Goal 3: Carbon flow between *L. pneumophila* and nematodes

Goal 4: Nematode grazing and vector function in biofilms

This working program offers a deep insight into the persistence, dissemination and metazoan pathogenicity of *L. pneumophila*. It will pave the way for improved hygienic refurbishment works in technical water systems.

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