

PhD scholarship from the Institute of Environmental Science and Research Ltd (ESR), New Zealand

Studying *Legionella* mobility and persistence in engineered water systems using micro mimics

We are seeking a highly motivated PhD student to develop novel surrogates for studying the mobility and persistence of *Legionella* in simulated plumbing systems under the influence of residual disinfectants. The PhD study forms part of a 3-year multi-disciplinary Marsden Fund project awarded by the Royal Society of New Zealand.

Engineered water systems (EWS), such as premise plumbing, can harbour *Legionella pneumophila*, which can cause severe pneumonia. Despite numerous legionellosis outbreaks, the behaviour of *L. pneumophila* in EWS is poorly understood. For the first time, food-grade biodegradable encapsulated biopolymer microparticles will be used to study how *Legionella* attach/detach and persist in these systems (including those grown with biofilms and amoebae) in the presence of residual disinfectants. The mimics will be compared alongside live *L. pneumophila* to validate their suitability as a model. We aim to develop a safe, inexpensive, detection-sensitive surrogate for *L. pneumophila* that can be used for in-situ investigations of *L. pneumophila* risk in EWS.

Your role will include:

- Synthesis of encapsulated biopolymer particles, and the optimisation of their physical and chemical properties
- Particle characterisation using a range of techniques (e.g., fluorescence microscopy, light microscopy, confocal microscopy, SEM, Zetasizer and qNano)
- Laboratory validation of the surrogates' mimicry of *L. pneumophila* in their mobility and persistence in the presence of disinfectants in simulated plumbing systems
- Quantification of surrogates and *Legionella* using quantitative polymerase chain reaction (qPCR) and epifluorescence microscopy

The starting date will be 1st March 2017 and you will be based at ESR's Christchurch Science Centre. ESR is a government-owned Crown Research Institute. You will be working with a group of scientists skilled in molecular microbiology, biochemistry and environmental water engineering. This research will be undertaken in collaboration with Professor Nick Ashbolt at the University of Alberta and Associate Professor Elmar Prenner at the University of Calgary.

You should have a strong background in molecular microbiology and biochemistry, with practical skills in qPCR methods and particle characterisation techniques. Preferably, you should have had some experience in working with microbial pathogens. Knowledge of biofilms and drinking water disinfectants would be advantageous.

This full scholarship includes a tax-free stipend of NZ \$27,500 per year for 3 years, plus university tuition fees. To apply for the scholarship award, your grades preferably need to be A- average or better.

If English is not your first language, you must have passed English exams with scores that meet the requirements for postgraduate study in New Zealand. For example, an IELTS score of at least 6.5 overall, and no less than 6.0 in each band. The certificate must be no more than 2 year old.

Please email an expression of interest letter, your CV, your academic transcripts, and the names of at least three referees to Dr Liping Pang (email: liping.pang@esr.cri.nz). Only the complete applications will be considered. The position will close as soon as a suitable candidate is found so we encourage applicants to apply as early as possible.