

Detection of *Leptospira* in Water

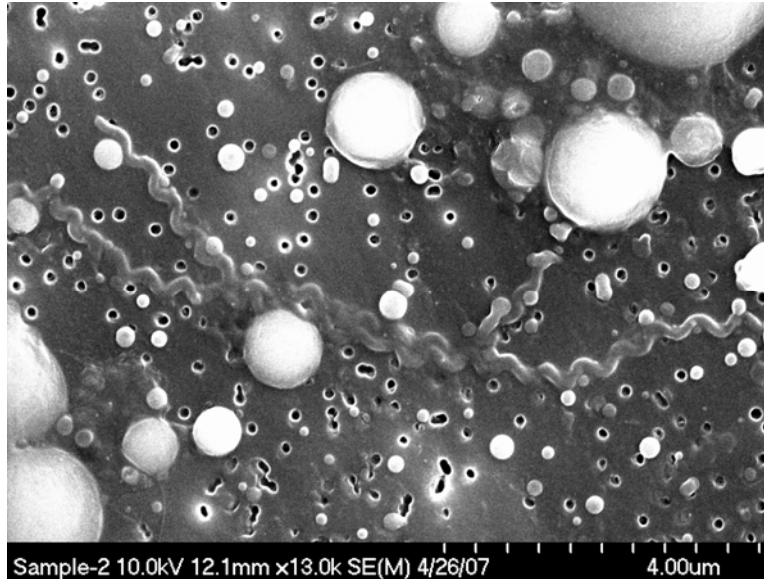


Figure 1: *Leptospira* spirochetes on the surface of a 0.22 µm pore diameter filter (Isopore polycarbonate membrane). Spirochetes are corkscrew-shaped organisms; 0.22 µm pores are circular and distributed throughout the image. The scale is shown at the lower right. Image collected with a Hitachi Field Emission Scanning Electron Microscope (FE-SEM) model S-4700 type II, operated at 10 kV

<i>Background/Need for Project:</i>	This project was a continuation of work begun with funding provided by U.S. EPA Region 9 associated with a sabbatical leave for Mark Walker at the University of Hawaii. CSREES Provided funding for this project to support a graduate student who explored application of molecular methods to detect <i>Leptospira</i> in water samples. The student, Ilima Hawkins, successfully completed her research (<i>Detecting Leptospira in Water: Evaluating a Proposed Method</i>) and Masters of Science program at the University of Hawaii in the natural resources and environmental management department.
<i>Location:</i>	University of Hawaii, Manoa; University of Nevada, Reno
<i>People involved:</i>	Mark Walker, Carl Evensen, Mayee Wong, Bruce Wilcox (University of Hawaii)
<i>Started/ Expected end date:</i>	8/2005 – 8/2010
<i>Brief project description:</i>	<i>Project objectives:</i> to develop a method to detect spirochetes of pathogenic <i>Leptospira spp.</i> in natural water samples. <i>Project activities to date:</i> I served as a member of Ilima's M.S. committee and developed the publication using her research results. <i>Accomplishments/Findings:</i> The results of Ilima's research

	<p>have been published in a peer-reviewed U.S. EPA report issued by the office of research and development, and national homelands security research center. The publication, method development and preliminary applications for <i>Leptospira</i> spirochetes in water samples, was issued in February, 2008 with publication number EPA/600 R- 08 /017.</p> <p><i>Plans for the future:</i> The progress reported in Ms. Hawkins' thesis and in the report published by U.S. EPA provided a sound foundation for further developing this technique. We are continuing work at the University of Nevada. Initial steps completed include improving methods to quantify stocks used for PCR trials, modification and optimization of the PCR protocol and exploratory trials with confocal scanning laser microscopy as a method of detection in slides. Our plans include conducting sampling on the Hanalei River (County of Kawaii, Hawaii) to assess the presence of pathogenic spirochetes in this river.</p>
<p><i>Outcomes:</i></p>	<p>U.S. EPA Region 9 remains involved with sampling and management of potential sources of <i>Leptospira</i> in to reduce the risk of infection especially in the western Pacific. The release and distribution of the report have created considerable interest among those in the western Pacific who were working to reduce the risk of public health consequences of exposure to pathogenic spirochetes in surface waters. There is a high prevalence of leptospirosis within island populations in some parts of the western Pacific, especially in western Samoa.</p>