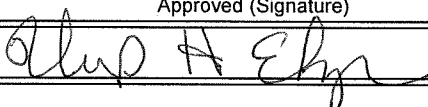


Animal

U.S. Department of Agriculture Accomplishments Report AD-421 U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month, Day, Year) 03/22/2012
1. Accession 0222133	Agency Identification No. 2. NIFA 3. LA.B	5. Work Unit/Project No. LAB94039	6. Status Annual Report
7. Title The Biology and Control of Aquatic Animal Diseases			
12. Investigator Name(s) (Last Name and Initials) Thune, R. L.			
20. Termination Date 01/31/2015		40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011	
Outputs: Project results were presented to producer groups, local and national scientific community, and aquaculture researchers through oral communications and one poster. Dr. Matt Rogge was awarded a competitive grant by the USDA National Institute of Food and Agriculture (NIFA) Agriculture and Food Research Initiative (AFRI) for his project entitled "The role of Type VI secretion in Edwardsiella virulence".			
Outcomes/Impacts: The utility of knowledge concerning bacterial pathogenesis was demonstrated by the selection of the genes for mutation and vaccine testing for Edwardsiella ictaluri. The use of optical mapping to resolve genome sequence confusion was a strong contributor to near completion of the F. asiatica genome. Markerless deletion mutants were constructed in genes encoding a Type III secretion system (T3SS) regulatory protein, a T3SS effector protein, and a Type VI secretion system translocon protein to produce three ictaluri strains for evaluation as live attenuated vaccines. Mutations in all three strains were stable after 30 in vitro passages, did not lose the ability to replicate in channel catfish cells, and invaded channel catfish in an immersion invasion in numbers that were not significantly different from the wild-type E. ictaluri. One mutant persisted for 9 days in the head kidney, while two of the mutants persisted for more than 2 weeks, although low level mortalities occurred in the early stages of infection. Fish challenged with wild type E. ictaluri 28 days following immersion vaccination with the three mutants experienced 95%, 100%, and 100% survival, while sham-vaccinated fish only had 11% survival. Because 454 sequencing resulted in a preliminary genome comprised of 624 contigs for Photobacterium damsela, and the Francisella asiatica preliminary genome was only 19 contigs, efforts focused on the F. asiatica genome. After reducing the genome to three contigs it became difficult to complete, so DNA subjected to optical mapping, allowed the assembly of three contigs, with 8-9 kb gaps.			
Publications: Baumgartner, W., and Thune, R. Arginine metabolism in the Edwardsiella ictaluri-channel catfish macrophage dynamic. 2011. LSU SVM Phi Zeta Research Emphasis Day. Sept 28, 2011, Baton Rouge, LA.			
Participants: Matt Rogge, post-doctoral researcher, and Lidiya Dubytska, post-doctoral researcher.			
Target Audiences: Local and national scientific communities.			
Project Modifications: Because of the complexity of the P. damsela preliminary genome, completion of the genome sequence has been suspended pending additional funding.			
Approved (Signature)	Title	Date	
		3-23-12	