CITRUS ADVANCED TECHNOLOGY PROGRAM

QUARTERLY & FINAL REPORTS: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

SELECT PERIOD December 2013

(●) *Quarterly Report* ( ) *Final*

Proposal Title

Molecular basis of Citrus Greening and related diseases gleaned from genome analyses of hosts and pathogens

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/15/14	Citrus Research and Development Foundation	Citrus Genomics

REPORT UPDATE (500 words-It is not necessary in this public report to disclose your institution's proprietary information or intellectual property.)

We completed prediction of local sequence features, function, and spatial structure for each Diaphorina citri psyllid protein by using MESSA server (MEta Sever for Sequence Analysis) developed in our lab. Total of 18,142 proteins were analyzed. Among these proteins, 94% proteins display similarity to known proteins database, and the closet homologous organisms are pea aphid and red flour beetle. 14,185 (78%) proteins have homologs with known of predicted functions. We also predicted Gene Ontology terms. 8,980 (50%) proteins have associated GO terms. We identified the homologous protein families by using HHsearch and RPSblast to search against the COG and Pfam database. 9,847 (54%) proteins were assigned to 1,191 COG clusters and 14,572 (80%) proteins were assigned to 3,191 Pfam families. We predicted spatial structure by using HHsearch and RPSblast to search against PDB and SCOP database. 83% psyllid proteins can find structure templates. Overall, the templates cover 70% of all residues in psyllid genome. All the results are available at <http://prodata.swmed.edu/citrusgreening/psyllid/>. This website constitutes a bioinformatics resource to facilitate the study on psyllid genome and its interaction with pathogen and citrus. By now, we have completed our software runs on all genomes needed for analysis: Liberibacter, citrus and psyllid, and generated all the data necessary to move to the second stage of the analysis - i.e. more in-depth expert-driven work to propose hypotheses about the interactions between proteins in these organisms and molecular mechanisms of Citrus Greening.

PI First Name Nick

PI Last Name Grishin

Email grishin@chop.swmed.edu

Phone 214-645-5952

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Form PR-12 Quarterly Reports **SUBMIT REPORT**

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.