1096-92-2566 **Mohammed Yahdi*** (myahdi@ursinus.edu), Depart of Mathematics & Computer Science, Ursinus College, Collegeville, PA 19426, and **Hongli Chen**, Department of Mathematics & Computer Science, Ursinus College, Collegeville, PA 19426. *Mathematical Model of Carbapenem-Resistant Enterobacteriaceae with Prevalence Settings.* Preliminary report.

The treatment of drug-resistant bacterial infections can become a global crisis due to the emergence of stronger antimicrobial resistance, and the scarcity of new antibiotics. More than two million people in the US become infected with antibiotic resistant bacteria, specially deadly and costly to ICU patients with vulnerable immune system. The infections caused by carbapenem-resistant Enterobacteriaceae (CRE), on the rise and designed by CDC as urgent infections, have been associated with high mortality in ICUs (up to two third), and have demonstrated resistance to the strongest antibiotics. Therefore, with limited treatment options, this project's aims include the use mathematical modeling tools to understand and simulate the mechanism underlying the spread of CRE in ICUs, and determine efficient and cost effective control strategies that incorporate special preventive measures. The dynamic model includes CRE susceptible, contaminated and infected patients, with low and high CRE risk and prevalence categories, as well as twenty-three independent parameters derived from research and clinical data. The model is distinctive by incorporating special preventive measures that have shown to significantly reduce infections and clear contaminations for other antimicrobial infections. (Received September 17, 2013)