E309 Celluar Responses of *Pseudomonas* sp. DJ-12 to Several Toxic Aromatic Hydrocarbons.

Yeon-Ja Ko and Chi-Kyung Kim
Department of Microbiolgy, Chungbuk National University

Aromatic hydrocarbons including chlorinated aromatics can be degraded by microorganisms, or inhibit their growth and metabolism because of toxicity. The organisms exhibit some protective responses when they are exposed to the chemical stresses. *Pseudomonas* sp. DJ-12 can grow utilizing 4-chlorobenzoate (4CBA), benzoate, and catechol as carbon and energy source at concentration of 1 mM or less, but inhibited at 3 mM or higher concentration. In the study, the viability, production of stress shock proteins, and morphological changes of the organism were examined by exposing the cells to various concentrations of 4CBA, benzoate, and catechol. The stress shock protiens (DnaK and GroEL) began produce in *Pseudomonas* sp. DJ-12 cells which were treated with benzoate and catechol at 1 mM for 5 min and with 4CBA at 0.5 mM for 20 min. The organisms treated with those chemicals showed some kinds of punctuation on their cell walls and changes in their membrane proteins.

E310 Nutritional Enhancement of Antifungal Activities of Selected Antagonisitc Bacteria against *Candida albicans*

Jung Mo Koo, Sang Ho Park[1], Dong-kyu Ko, Ki-Sung Lee, and Chang Won Choi*
Department of Biology, Pai Chai University, 302-735 Taejon, and [1]Korea Research Institute of Bioscience and Biotechnology, P.O. Box 115, Taejon, Korea

Five bacterial strains (KL1114, KL1121, KL1143, KL1179, and KL1326) were isolated as effective antagonists of *Candida albicans* and found to inhibit the growth of the fungus and to produce bioactive metabolites on agar plates. Since several environmental factors may influence on the efficacy of antagonism, it is important to obtain a basic information about the effects of some nutrients on the production of bioactive metabolites, the growth of antagonists and a target microorganism. Therefore, the effects of four amino acids and three vitamins were evaluated on the efficacy of antifungal activities of bacterial strains. When vitamins were compared, vitamin B1 stimulated the inhibitory activities of four strains against *C. albicans*, while vitamine B2 was an effective one for strain KL1121. Addition of amino acids to the media resulted in increase of the antagonsitic effects, but the synergism effect of each amino acid was dependent on the strain type and the presence of vitamins. When antagonsim was compared in five different pHs, the maximal inhibition was obtained in pH 7.0. Thus, the details of some nutritional factors on antagonsim between the bacteria and *C. albicans* are presented.