ABSTRACTS
* Author Presenting Paper

37 Metabolic diversity of lactobacilli. Byong H. Lee*, *McGill University, Agriculture-Agri-Food Canada*.

Lactic acid bacteria (LAB) are intimately associated with food, feed, health and they are particuarly involved in many fermentation processes of milk, meat and vegetables,etc. For this reason they have become established as a major target for modern biotechnological research and development. These bacteria form a diverse group of microorganisms, such as the genera, Lactobacillus, Lactococcus, Streptococcus, Leuconostoc,and Pediococcus, which are Gram-positive, nonsporulating, catalase-negative, acid/aero tolerant, and produce lactic acid as the major end-product of sugar metabolism. LAB contain no cytochromes, and thus energy production depends solely on substrate-level phosphorylation, mainly from carbohydrates. The dairy industry is a prime user of these organisms, representing about 20% of the total value of fermented foods world-wide. Milk can be fermented into well over a thousand products and thus the diversity makes a discussion of the metabolism complex. The mechanisms by which milk satisfies the requirments of LAB for free amino acids and fermentable sugars are the most complex and widely-studied. Recent developments in the application of molecular biology to LAB have shown that it could be feasible to engineer metabolic pathways to either enhance specific metabolic fluxes or to divert metabolites for the production of different or new end products. However, this engineering requires detailed knowledge of metabolism and regulation within the targeted organism. Among LAB lactobacilli are the most frequently involved in food fermentation processes, many of which are applied on an industrial scale. This seminar will examine some of the major research achievements that have contributed to our present knowledge of lactobacilli on metabolic diversity. Up-to-date examples will be given on plasmid or chromosomally encoded functions on hydrolyses and metabolisms of proteins/amino acids, carbohydrates, lipids/fatty acids, citrate, while it links to the synthesis of bacteriocins, exopolysaccharides, and pigments, etc. The genetically engineered lactobacilli could also produce various heterologous proteins.

Key Words: metabolism, diversity, lactobacilli