# Abstract of Presentation

**Note: This paper should be typed in "Times New Roman" of 12pt.**

Name (Underline the family name)

Jun OGAWA

Presentation Title(Should be no more than 20 words):

Potentials of Microorganisms for Functional Food Production and Probiotics

Abstract : Unique reactions catalyzed by microorganisms were screened and applied for the production of functional food materials such as anti-diabetic amino acids (4-hydroxyisoleucine etc) and anti-obesity conjugated fatty acids (CLA etc). Furthermore, based on the analysis of nucleic acid metabolisms in lactic acid bacteria, a novel application for anti-hyperuricemia probiotics was investigated.

Production of 4-hydroxyisoleucine: 4-Hydroxyisoleucine (HIL) is a potential functional food material for the treatment of diabetes and obesity. Enzymatic synthesis of HIL was investigated. *Bacillus thuringiensis* was found to produce HIL from L-isoleucine (Ile). The enzyme catalyzing the hydroxylation was purified and characterized as a 2-ketoglutarate dependent dioxygenase (Ile dioxygenase; IDO). IDO was found to show hydroxylation activity of C4-position of Ile and produced a single HIL stereoisomer, 2*S*,3*R*,4*S*-HIL.

Production of conjugated fatty acids: Conjugated fatty acids have attracted much attention as a novel type of biologically beneficial functional lipid. Some isomers of conjugated linoleic acid (CLA) reduce carcinogenesis, atherosclerosis, and body fat. We found that lactic acid bacteria produce CLA from linoleic acid. The produced CLA comprised a mixture of *cis*-9,*trans*-11-octadecadienoic acid (18:2) and *trans*-9,*trans*-11-18:2. *Lactobacillus plantarum* AKU 1009a was selected as a potential CLA producer. The strain transformed α- and γ-linolenic acid to corresponding conjugated trienoic fatty acids. Furthermore, some anaerobic bacteria were found to transform EPA and arachidonic acid to the corresponding conjugated fatty acids.

Probiotics for hyperuricemia prevention: Hyperuricemia is a disease, which results from the overproduction and/or under excretion of uric acid and is greatly influenced by a high dietary intake of purine. We attempted to design a new prophylaxis for hyperuricemia using probiotic effects of microorganisms. Lactic acid bacteria were screened for their ability to degrade nucleic acid metabolites. Lactic acid bacteria isolated from fermented food were examined as to their effects on the serum uric acid level using the rats pretreated with the uricase inhibitor, potassium oxonate, as animal models for hyperuricemia. The ability to lower elevated level of serum uric acid was found in *Lactobacillus fermentum* and *L. pentosus*.