P111

New Synthesis of Natural *endo*-brevicomin from L-tartaric Acid.

Hwan-Gyu Jung, Won-Hyung Lee, Joo-Hyeung Nam and Young-Bae Seu*

School of Life Science and Biotechnology, Kyungpook National University,Daegu 702-701, Korea

Optically active epoxide (2*S*, 3*R*)-3,4-epoxy-1,2-butanediol acetonide derived from natural L-tartaric acid is an important C-4 chiral building block for the synthesis of biologically active molecules such as chiral drugs, agrochemicals and natural products.

For example, various brevicomin isomers are pheromone formed of prominent bicyclic acetals, obtained from several western pine beetle species of the *Dendroctonus, Dryocoetes* family and so on. The derivatives of the brevicomins are avariety of bark beetle species' pheromones and play a key role in the system of chemical communication among them.

The precursor of synthetic brevicomin needs two vicinal chiral alcohol carbons and these two chiral carbons can be derived from tartaric acid. Herein, we selected a cheap and easily available natural (2*R*, 3*R*)-L-tartaric acid as the starting material. In enantiospecific synthesis of the pine beetle pheromone, the natural (1*R*, 5*S*, 7*S*)-(+)-*endo*-brevicomin was easily achieved via the (2*S*, 3*R*)-3,4-epoxy-1,2- butanediol acetonide as the main chiral intermediate.

P112

Synthesis of Novel Cholesterol Based Cationic Lipids, Transfection Biology of Human Cell line

Won-Hyung Lee, Bieong-Kil Kim, Joo Hyeung Nam, Kyung-Oh Doh[1], Ik-Jae Moon[2] and Young-Bae Seu*

School of Life Science and Biotechnology, Kyungpook National University, Daegu 702-701, Korea
[1]*Department of Physiology, Yeungnam University College of Medicine, 317-1 Daemyung-dong, Daegu 705-717, Korea*
[2]*WelGENE Inc., 71B-4L, Hightech Sector 2, Sungseo Industrial Park 3, Dalseogu, Daegu, 704-230, Korea*

Successful transfer of the genetic materials using effective and safe vectors is one of major issues in the field of gene therapy using nucleic acids such as plasmids, antisense, decoy and siRNA. However, generally genetic materials are easily degraded by nuclease, and show ineffective delivery. Although the efficiency of viral vectors is higher, non-viral vectors have been vigorously studied owing to the advantage of ease of synthesis, low immune response and safety. Moreover, non-viral vectors can deliver various chemical drugs as well as nucleic acids. Therefore, in this study, we used cationic lipids, one of representative non-viral vectors, which were newly synthesized. In this preparation for gene transfection, 4 kinds of novel cholesterol-based cationic lipids were synthesized(Lipid 1 - 4). The new structure of cationic lipids contains a cationic head group of poly amine and a hydrophobic domain of cholesterol base. We compared with commercial Liposomes and new synthesized liposomes for gene transfection in Huh7 cell-line (hepatoma cell). In the absence of FBS, Lipid 2, 3 and 4 were more efficient than Lipofectamine^{TM} of 1.9, 1.8 and 3.1 times, respectively. And In the presence of FBS, Lipid2 and 3 were more efficient than Lipofectamine^{TM} of 4 and 3.3 times respectively. We confirmed the same result when we transferred GFP plasmid DNA to cell in the presence or absence of FBS.

Key words: Cationic lipids, cholesterol base, transfection, gene therapy, non-viral vector