F219

Brassinosteroid-induced Gravitropism in *Arabidopsis* Roots

Young-Soo Kim[P], Tae-Wuk Kim[1], Jongkil Choo[1], Soo Chul Chang[2], June Seung Lee[3], Seong-Ki Kim[C]

[PC1]Department of Life science, Chung-Ang University, Seoul 156-756; [3]Department of Biological Science, Ewha Womans University, Seoul 120-750; [2]Center for Cell Signaling Research, Ewha Womans University, Seoul 120-750

Exogenously applied brassinosteroids activated gravitropic curvature of *Arabidopsis* roots. The mechanism of the brassinosteroids-induced gravitropic response in *Arabidopsis* roots was thus examined by the use of wild-type and several mutants related to brassinosteroids signal transduction pathway. The *bri1-201* and *bak-1*mutant showed less gravitropic activity than that of wild-type. *BRI-GFP* exhibited much gravitropic response compared with that of wild-type. Application of brassinazole, a brassinosteroids biosynthetic inhibitor, did not decrease the gravitropic curvature in wild-type roots. Therefore it was thought that the brassinosteroids-induced gravitropic curvature was mediated not by increase of endogenous level of brassinosteroids but by enhancement of brassinosteroids signal perception in *Arabidopsis* roots. In addtion, involvement of IAA in the brassinosteroids-induced gravitropic response of *Arabidopsis* roots was examined. In the presentation, the change of endogenous IAA level mediated by brassinosteroid signal transduction will be also discussed.

F220

Importance of C-26 Demethylation for Homeostatic Regulation of Brassinosteroids in Plants

Hyun-Hee Park[P], Seong-Ki Kim[C]

Department of Life science, Chung-Ang University, Seoul 156-756

Conversions of [2H0] and [2H6]castasterone (CS) using a enzyme solution were carried out in maize, which brassinolide (BL) has not identified yet. GC-MS analysis of the metabolites revealed that [2H0] and [2H6]CS is converted into [2H0]26-norCS and [2H3]28-norCS, respectively. Because we previously determined that [2H6]BL to [2H3]28-norBL is an artificial reaction by isotope effect, the C-26 demethylation of CS was thought to be a natural reaction. Next, enzymatic conversions of [2H0] and [2H6]CS in *Phaseolus vulgaris* and *Marchantia polymorpha* were also examined. As enzyme product, not only [2H0] and [2H6]BL but also [2H0]26-norCS and [2H3]28-norCS were identified, providing the C-26 demethylation of CS simultaneously occurred with the conversion of CS to BL in the plants. Possibility for the C-26 methylation in CS biosynthetic precursors such as 6-deoxoteasterone, 6-deoxo-3-dehydroteasterone,and 6-deoxotyphasterol was subsequently investigated. Based on interpretation of mass spectra, the metabolites were tentatively identified as 6-deoxo-26-norteasterone, 3-dehydro-6-deoxo-26-norteasterone, and 6-deoxo-26-nortyphasterol, which suggested that the C-26 demethylation is a common and an important reaction to maintain a steady-state level of brassinosteoids in plants.

F221

Nitric Oxide and Tumor Necrosis Factor-alpha Production by *Arctium lappa* in Mouse Peritoneal Macrophages

Hwan-Suck Chung[P], Hyo-Jin An[1], Hyun-Ja Jeong[2], Seung-Heon Hong[1], Hyung-Min Kim[2], Su-Jin Yoo[3], Woo-Jun Hwang[C]

[P1]Department of Oriental Pharmacy, College of Pharmacy, VCRC of Wonkwang University, Iksan 570-749; [C]Professional Graduate School of Oriental Medicine, Wonkwang University, Iksan 570-749; [3]Department of Emergency, Wonkwang University School of Medicine, Iksan 570-749; [2]Department of Pharmacology, College of Oriental Medicine, Kyung Hee University, Seoul 130-701

Arctium lappa (AL)is a plant widely used in medicine for the treatment of a variety of pathologies. We tested immunomodulatory activities of AL in mouse peritoneal macrophages. Addition of AL caused a induction in nitric oxide (NO) production by macrophages stimulated with interferon-gamma (IFN-gamma). In the presence of AL, macrophages stimulated with IFN-gamma, produced higher levels of tumour necrosis factor-alpha (TNF-alpha). The increased production of NO from IFN-gamma plus AL-stimulated peritoneal macrophages was decreased by the treatment with *N*G-monomethyl-L-arginine or *N*(alpha)-Tosyl-Phe Chloromethyl Ketone. Nuclear factor-kappa B (NF-kappa B) inhibitor, pyrrolidine dithiocarbamate was able to completely inhibit the production of NO and TNF-alpha. As NO and TNF-alpha play an important role in immune function, AL treatment could modulate several aspects of host defense mechanisms due to stimulation of the inducible nitric oxide synthase via NF-kappa B activation.

F222

Generation of 5,469 Expressed Sequence Tags from the Root Nodule of *Glycine max*

Hyoungseok Lee[P], Cheol-Goo Hur[2], Chang Jae Oh[1], Chung Sun An[C]

[PC1]School of Biological Sciences, Seoul National University, Seoul 151-742; [2]National Center for Genome Information, Korea Research Institute of Bioscience and Biotechnology, Daejeon 305-333

For the high throughput screening of useful genes, three root nodule specific cDNA libraries from soybean were constructed from three different stages of root nodules after inoculation with *Bradyrhizobium japonicum*USDA110. The nodule-specific EST database was constructed from these cDNA libraries. To eliminate redundancy, we performed the differential hybridization using high redundant clones as probes. As a result, 5,469 cDNA clones were sequenced, these EST sequences were clustered into 2,511 non-redundant sequences comprised of 769 non-redundant clusters and 1,742 singletons. Similarity searches were done against NCBI non-redundant protein databases, soybean EST database and MIPS database. From these results we could make the functional catalog of our ESTs, including 1) several nodule specific genes named nodulin, 2) various stress-responsive genes, 3) genes related to carbon and nitrogen metabolism, 4) putative kinase and phosphatase. Also to analyze expression patterns of some clones, we performed northern hybridization from various tissues and from root nodules of different developmental stages. cDNA clones and EST database o'tained from this study will be used for cDNA microarray .o study the genetic program for root nodule and general development of plant.