058(3aB05)

ACETYL-COA CARBOXYLASE AS A REGULATOR OF FLAVONOID SYNTHESIS

Tomokazu KONISHI, 1Nobuyoshi NAKAJIMA and Hiroetsu WABIKO, Biotech Inst., Fac. Bioresource Sci., Akita Pref. Univ., Ohgata 010-0444, 1Natl. Inst. Environ. Std., Tukuba 305-0053

To investigate functions of cytosolic acetyl-CoA carboxylase in plants, expression of the gene and regulation of the amount of the enzyme were determined during flavonoid synthesis that had been triggered by UV irradiation. The mechanisms that regulate flavonoid synthesis will be discussed.

059(3aB06)

ABSCISIC ACID IS BIOSYNTHESIZED VIA THE NON-MEVALONATE PATHWAY IN A PLANT, AND VIA THE MEVALONATE PATHWAY IN FUNGI

Nobuhiro HIRAI, Ryuji YOSHIDA[1], and Hajime OHIGASHI. Div. App. Life Sci., Grad. Sch. Agric., Kyoto Univ., Kyoto 606-8502, [1]Dept. Agric. Tech., Toyama Pref. Univ., Toyama 939-0311

Abscisic acid (ABA) has been believed to be biosynthesized via carotenoids in plants, suggesting that a biosynthetic precursor of ABA is not mevalonate but 2-*C*-methyl-D-erythritol. In contrast to plants, fungal ABA would be biosynthesized directly from mevalonate. We investigated biosynthetic precursors of ABA in a plant and fungi by feeding [1-^{13}C]-D-glucose to young shoots of tuliptree, and to two ABA-producing fungi, *Botrytis cinerea* and *Cercospora pini-densiflorae*.

^{13}CNMR spectra of ABA isolated from the plant revealed that carbons 1, 5, 6, 4', 7', 9' were labeled 22 times with ^{13}C. β-Carotene from the plant was also labeled with ^{13}C at carbons corresponding to the labeled carbons of ABA. ABAs from the fungi were labeled at carbons 2, 4, 6, 1', 3', 5', 7', 8', 9', 15-27 times with ^{13}C. These findings confirmed that ABA is biosynthesized via the non-mevalonate pathway in a plant, and via the mevalonate pathway in fungi.

060(3aB07)

THE EFFECT OF METHYL JASMONATE ON 2,4-D STIMULATED SCOPOLETIN UPTAKE BY TOBACCO CELLS

Goro TAGUCHI[1], Kotarou YOSHIZAWA[2], Nobuaki HAYASHIDA[2], Mitsuo OKAZAKI[1,2]; [1]Gene Research Center, & [2]Dept. Appl. Biol., Fac. Text. Sci. Technol., Shinshu Univ., Ueda 386-8567

T-13 cell line of tobacco Bright Yellow has an ability for production of scopoletin, a kind of coumarins and can grow on hormone-free medium. In 2,4-D-treated T-13 cells, scopoletin is taken up from culture medium and accumulated in the vacuoles after conversion to scopolin. To investigate this effect of 2,4-D on tobacco cells, several kinds of plant hormone were tested. Auxins and salicylic acid stimulated the uptake as like 2,4-D, though they demanded high concentration. When the hormones were added to the cells with 2,4-D, methyl jasmonate and kinetin inhibited the stimulation of scopoletin uptake. Methyl jasmonate was showen to stimulate the scopoletin biosynthesis, causing efflux of some of it into the medium. When the biosynthesis of scopoletin was inhibited by AOPP, a PAL inhibitor, methyl jasmonate still inhibited scopoletin uptake caused by 2,4-D. These results suggest that methyl jasmonate effects on this uptake inhibitory.

061(3aB08)

Regulation of nicotine biosynthesis gene by jasmonate, ethylene, and *NIC* genes

Tsubasa SHOJI[1], Tadayuki IWASE[1], Kenzo NAKAMURA[2], Yasuyuki YAMADA[1], and Takashi HASHIMOTO[1], Grad. Sch. Bio. Sci., NAIST, Ikoma 630-0101[1]. Grad. Sch.Agri.,Nagoya Univ.Nagoya 458-1234[2]

Nicotine is the predominant alkaloid in tobacco. Several genes involved in nicotine biosynthesis (PMT,A622,ODC,and QPT)are down-regulated in tobacco mutants (*nic*) with very low nicotine contents. These nicotine biosynthesis genes were coordinately induced by jasmonate and the jasmonate-induction was suppressed by stimultaneous addition of ethylene. Thus, *NIC* genes, jasmonate and ethylene regulate genes involved in nicotine biosynthesis.

To understand molecular mechanisms of *NIC*-regulated gene expression , we studied promoter expression of *PMT* and *A622* reporter genes fused to a GUS reporter gene. All the promoter were similarly expressed in specific cells in root tissues and activated by jasmonate. Expression pattern of the promoters in *nic* mutants will also be reported.