adenosylmethionine decarboxylase (SAMDC) 유전자와 에틸렌 생합성에 관여하는 1-aminocyclopropane-1-carboxylic acid synthase (ACC synthase) 및 ACC oxidase의 유전자를 sense 혹은 antisense 방향으로 담배에 도입시켜 폴라아민 생합성량이 증가된 형질전환 식물체에서 스트레스 관련 신호전달 및 항산화효소의 유전자 발현을 mRNA 수준에서 조사하였다. 이들 식물체는 저온, H_2O_2, ABA, NaCl, 산성용액, 박테리아 및 곰팡이에 대해 저항성이 높았다. 우선 스트레스 신호전달 과정에 관여하는 유전자의 단백질의 유전자 발현조사를 위하여 RT-PCR을 통하여 MAP kinase, MAP kinase kinase, GST,GR, CAT, MnSOD, Cu/Zn SOD, AP의 유전자를 담배 식물체로부터 분리하였다. 식물체 잎 절편을 250 mole m^{-2} S^{-1}의 빛에 노출시키면서 0, 2, 5, 10, 20, 30, 40, 50, 60분동안 100mM H_2O_2를 처리하였을 때 SAMDC 과다발현 식물체에서는 야생형식물체보다 다소 일찍 10분후부터 신호전달 과정에 관여하는 MAP kinase 유전자의 발현이 축적됨을 확인할 수 있었다. 또한 같은 빛조건 아래 0, 1, 2, 3, 6, 9, 12, 18, 24시간동안 100mM H_2O_2를 처리하였을 때 적응과정으로 산화적 스트레스에 대해 방어적인 역할을 하는 GST, catalase, MnSOD등의 효소들의 발현이 증가하였다. 생물적 스트레스로서 *Phytophthora parasitica* pv. Nicotianae를 식물체에 감염시켰을 때 pathogen-related(PR) protein인 PR-1의 유전자 발현이 이들 형질전환 식물체에서 증가하였다. 따라서 폴리아민의 세포내 함량의 증가가 스트레스 저항성 관련 유전자의 발현을 통하여 저항성을 유도하여 식물체의 노화지연과 스트레스의 저항 기작에 관여할 수 있을 것으로 예상된다.

E221 Characterization of Single Strand Telomere DNA Binding Proteins from Soybean (Glycine max) Suspension Culture

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We identify and characterize the proteins that specifically bind to the plant single-strand telomeric repeats ((TTTAGGG)n) in the nuclear extracts from the soybean suspension cell. Two types of specific complexes are detected by gel retardation assays. Complex I gradually decreases when the stationary stages begins. And complex II appears in the earlier and later stationary stages. Complex I binds to the single-strand G-rich telomere DNA containing at least two or more repeats. It has lower affinity to human telomere sequence, and even it does not bind to Tetrhymena or mutated telomere sequence. Unlike the other telomere-binding proteins, complex I is not resistant to both high salt concentration and heat treatment. These data suggest that each complex is regulated in different growth stages of soybean suspension culture. Furthermore, complex I specifically binds to the plant single-strand telomere DNA and it plays a role in the protection of the chromosomal end.

E222 Germicidal and Insecticidal Activity of Volatile Components of Medicinal Plants(Illicium verum Hooker filius and Eugenia caryophyllata THUNBERG)

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The germicidal and insecticidal properties of volatile components extracted from *Illicium verum* Hooker filius(IVO) and *Eugenia caryophyllata* THUNBERG(ECO) were evaluated against seven microorganisms and three insects for the purpose of developing biocidal active substances from medicinal plants. The IVO and ECO showed strong antimicrobial effect against *Aspergillus niger*, *Penicillium funiculosum*, *Mucor hiemalis*, *Trichoderma viride*,

Aureobasidium pullulans, and *Escherichia coli*. The ECO showed strong germicidal effects against all strains except *S. aureus* at 1000ppm level, but the IVO showed just fungistatic and bacteriostatic effect. The extracts of each medicine also showed insecticidal effects against *Sitophilus oryzae* L., *Lyctus linearis* GOZE, and *Reticulitermes spertus kyushuensis* Morimoto. Contact and fumigant toxicities to adult insects were determined. The main constitute of volatile components, anethole among 20 components from IVO and eugenol among 9 components from ECO were identified.

E223 Characterization of Transgenic Potato (Solanum tuberosum L.) tubers with Sink Metabolism-related gene

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The aims of these studies were to use tubers from transgenic lines of potato (*Solanum tuberosum* cv. desiree and cv. superior) containing increased amounts of AGPase and decreased acid invertase to understand the role of this enzyme in the control of starch synthesis. To develop the tuber-specific and amyloplast-specfic expression vector, we constructed vectors of PBI/PAT/TP under the controls of patatin promoter and transit peptide-coding region. Potato stem segments were transformed by *Agrobacterium* strain C58C1 containing sense rice AGP(PBI/RAGP) and antisence potato acid invertase (PBI/INV) vectors. We obtained 7 transformed lines with PBI/INV and 3 transformed lines with PBI/RAGP through NPT? sequences analysis by PCR.

E224 Effect of Brassinazole on the Ethylene Production and Gravicurvature in Primary Roots of Maize

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Brassinosteroids (BR) is widely distributed in plants, and they are possibly biosynthesized in all parts of plant organs. It has been known that some triazole derivatives are good inhibitors for BR biosynthesis. Brassinazole (Brz) has been known a potent inhibitor in the BR biosynthesis, because it has a tertiary hydroxy group on the carbon adjacent to the carbon where a triazole ring attached. The treatment of Brz stimulated the IAA-induced ethylene production and the activity of ACC oxidase in the range from 1 nM to 0.1 uM in primary roots of maize. Gravistimulated curvature was stimulated in roots pretreated with 0.1 uM Brz for 1 hr compared to that of control during 8 hr. We will discuss the action of the Brz in the physiological role connected with the BR biosynthesis pathway.

E225 Action of Brassinosteroid on the Ethylene Production in Primary Roots of Maize

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Brassinosteroids (BR) are a family of over 40 naturally occurring plant steroid hormones found in a wide variety of plant species. Brassinolide (BL) is the active component of BR and has a diverse variety of physiological responses including cell elongation, reduced root elongation, leaf bending and epinasty. Based on the facts that BR stimulated the IAA-induced ethylene production in maize roots in the range from 1 nM to 0.1 uM, we examined the effect of BR on both ACC oxidase (ACO) and ACC synthase (ACS) activity.