We are interested in understanding the physiological role of the N-linked glycoproteins secreted in the cell-wall during elongation growth. Therefore, as a first approach toward the biosynthesis and characterization of cell-wall glycoproteins we have investigated the metabolism of D-[U-^{14}C]glucosamine and N-acetyl-D-[1-^{14}C] glucosamine during elongation growth induced by Fusicoccin (FC) in coleoptile segments isolated from etiolated avena seedlings (*Avena sativa* L., cv. angelica). Further we have analysed the incorporation of radioactive N-acetyl-D-glucosamine residues in the polymeric material present in either the endomembrane system or the purified cell-walls.

Both D-[U-^{14}C]glucosamine and N-acetyl-D-[1-^{14}C]glucosamine were actively taken up by coleoptile segments and rapidly metabolised according to the following metabolic pathway: D-glucosamine → N-acetyl-D-glucosamine → N-acetyl-D-glucosamine 6-P → N-acetyl-D-glucosamine 1-P → UDP-N-acetyl-D-glucosamine and UDP-N-acetyl-D-galactosamine. All soluble radioactive metabolites were qualitatively and quantitatively analysed by paper electrophoresis and paper chromatography (Piro G., Perotto S., Bonfante-Fasolo P., Dalessandro G., 1988, *J. Plant Physiol.* 132:695). The uptake of either D-[U-^{14}C]glucosamine or N-acetyl-D-[1-^{14}C]glucosamine was stimulated by FC. The metabolic pathway was markedly inhibited by FC in the coleoptiles incubated in the presence of D-[U-^{14}C]glucosamine whereas it was not influenced by FC when N-acetyl-D-[1-^{14}C]glucosamine was used as exogenous substrate. This indicates that FC inhibits the enzyme involved in the acetylation of D-glucosamine. The mechanism of this inhibition has to be established. Nevertheless, it is important to point out that the N-acetyl-D-glucosamine transferase [EC 2.3.1.3] activity is tightly linked to the membranes isolated from avena coleoptile segments (Buffo M., Piro G., Dalessandro G., 1989, *Giorn. Bot. It.* 123, suppl. 1). The radioactive UDP-N-acetyl-D-glucosamine synthesized *in vivo* from both substrates (D-[U-^{14}C] glucosamine and N-acetyl-D-[1-^{14}C]glucosamine) was likely used as glycosyl donor for the synthesis of asparagine-N-acetyl-D-glucosamine-linked oligosaccharide chains. The amount of radioactivity incorporated as N-acetyl-D-glucosamine residues in these glycoproteins present in either the endomembrane system or purified cell-walls was not correlated to the elongation growth induced by FC.

ABNORMAL GROWTH OF LETTUCE AND PEPPER SEEDLINGS TREATED WITH MONODEACETYLFUSICOCCIN

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It is well known that fusicoccin (FC) breaks dormancy of certain seeds, e.g. lettuce, and stimulates seed germination of many plants. Similar effects are also induced by a number of *Fusicoccum amygdali* metabolites structurally related to FC, showing lower toxicity towards plants.

One of these compounds, monodeacetylfusicoccin (MAF) at concentrations of

10 mg/l or 60 mg/l respectively, was used as a soaking treatment for lettuce and pepper seeds. As expected, the germination time of treated seeds in standard germination trials was substantially reduced. However, seedlings from treated seeds showed some abnormal growth (stem distorsions). These effects may have undesirable consequences for practical applications.

An almost complete reduction of the stem growth abnormalities was obtained by soaking MAF-treated seeds in a 5-10 mg/l solution of benzyladenine (BA) for 3 h. However, roots of treated lettuce seedlings were shorter than those of controls. Addition of 10 mg/l $AgNO_3$ to BA gave no substantial advantage. Seed treatment with kinetin (2.5 mg/l) gave results similar to BA, without affecting root length.

The results of the experiments seem to indicate that the abnormal growth of the seedlings is mainly a consequence of the effect of MAF on plant cell growth and may be counteracted by cytokinins.

EFFECT OF FUSARIC ACID AND ITS STRUCTURAL ANALOG PICOLINIC ACID ON THE RELEASE OF SUBSTANCES FROM BARLEY LEAF SEGMENTS AND RED BEET ROOT DISKS

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Treatments with 1 mM fusaric acid (pKa 5.75) induced the release of electrolytes from barley leaf segments, indicating some modification on plasmalemma permeability. In red beet root disks fusaric acid induced both electrolyte leakage (measured as electrical conductivity) and betacyanin release (measured as optical density at 535 nm) already at the 0.5 mM concentration. The structural analog picolinic acid (pKa 5.35) was completely ineffective between 0.5 mM and 4 mM concentrations. The effect of fusaric acid in red beet root disks was also tested at three external medium pH (4.5, 5.5 and 6.5). The leakage of electrolytes and the release of betacyanins increased with the decrease in pH of the medium, suggesting that only the uncharged molecule was active. Moreover, the release of betacyanins indicates that fusaric acid also influences tonoplast functionality or structure.

CALCIUM INVOLVEMENT IN THE INHIBITING ACTION OF OPHIOBOLIN A IN THE EARLY PHASES OF RADISH SEED GERMINATION

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In maize roots ophiobolin A (OPH) interferes with proton extrusion activity, which operates at plasmalemma level, and increases potassium permeability. More