observed, when compared with the control diet. There was no correlation between body weight and the level of plasma cholesterol ($r = -0.007$).

It appears from the present study that the cholesterolemic response to soyabean lecithin in veal calves differs from that in humans and nonhuman primates. In the latter 2 species, no effect[3-5] or a decrease[2,6,7] in plasma total cholesterol were reported, whereas we found that soyabean lecithin elevated plasma cholesterol concentrations in nonruminant calves.

The differential effect of dietary soyabean lecithin on plasma total cholesterol in rhesus monkeys and calves may be related to differences in lipoprotein metabolism. In rhesus monkeys low-density lipoprotein (LDL) particles carry about 70% of total plasma cholesterol, whereas the high-density lipoproteins (HDL) contain about 30%. In rhesus monkeys lecithin caused a 36% decrease in LDL-cholesterol, and an increase of 10% in HDL-cholesterol[2]. Together this resulted in a reduction in total plasma cholesterol concentration of 23%[2]. In calves approximately 80% of the plasma cholesterol is transported by the HDL fraction[8]. Possibly, dietary soyabean lecithin specifically increases the level of HDL-cholesterol. Clearly, further studies are required on this point.

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Auxin effects on root growth and ethylene production

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Summary. Maize root segments were treated with indol-3yl-acetic acid (IAA) and growth effects and ethylene production were analyzed. The increase of ethylene production due to IAA was quite small; therefore it is difficult to conclude that ethylene could - as previously postulated - mediate the growth inhibition induced by IAA.

It has been shown that IAA promotes ethylene production in roots[2,3]. As IAA and ethylene may inhibit root elongation[2,3], it has been suggested that IAA-induced root growth inhibition could be due not to a direct effect of IAA, but to the action of ethylene produced in response to IAA[2,4]. However, when comparing the growth effects of IAA and ethylene both applied to roots, such hypothesis has been discarded[3]. In this paper this question will be reexamined by analysis of the endogenous ethylene production promoted by auxin in maize roots.

Caryopses of *Zea mays L.* (cv. LG 11) were grown in darkness at 19 °C as previously described[5]. After 46 h, rectilinear primary roots of 15 ± 3 mm were selected and 10 ± 0.2 mm apical root segments were prepared under dim green light. They were mounted in plastic frames with their basal cut ends covered with filter paper moistened with 2(N-morpholino) ethane sulfonic acid (MES) (5 mM, pH 6.1) buffer or buffer plus IAA. The frames were then placed in special gas-tight boxes in which a humid atmosphere ($90 \pm 5\%$ relative humidity) was maintained. Segments were incubated for 6 h in a vertical position, in light (white fluorescent source, $0.9 \pm 6 \times 10^{-2}$ J × m^{-2} × sec^{-1})[6] or in the dark. Ethylene production of root segments was measured by gas-chromatography[7]. Root segments were photographed under dim green light at the beginning of the experiments and after 6 h. The lengths were taken from the negatives magnified 3 times.

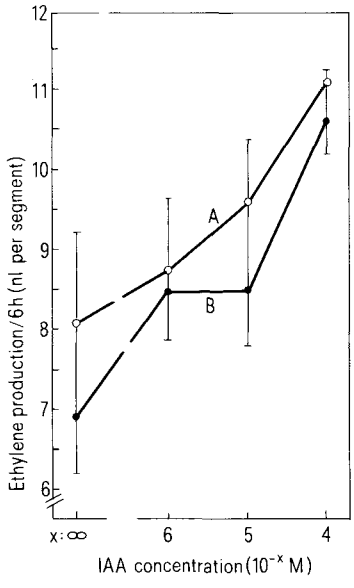

Figure 1. Ethylene production (in nl per 40 segments and ± SE) after 6 h of apical maize root segments. Segments were incubated in a vertical position, in light (A) or in darkness (B).

It is clear from figure 1 that IAA stimulated very weakly the ethylene production of maize root segments incubated in the light or in the dark. This differed significantly from the large enhancement of ethylene production observed when pea root segments were treated with IAA[2,3]. The effects of IAA on elongation of maize root segments are shown in figure 2. In the dark, IAA progressively and strongly inhibited root elongation from 10^{-6} to 10^{-4} M. When root elongation was already inhibited by light, IAA reduced the elongation further at 10^{-5} and 10^{-4} M. It has been reported that ethylene, applied from 100 to 1000 nl/l inhibited maize root elongation only weakly[8] and had no effect at the lowest concentration tested (100 nl/l). But it is of course difficult to compare the consequences of ethylene application (expressed per l of air) and the ethylene production (calculated per a given number of root segments). Nevertheless it can be concluded that, at least for maize root segments but probably for all the roots of monocotyledonous plants, the stimulation of ethylene production induced by IAA is far too weak to affect elongation. Thus the inhibition of root growth induced by IAA can only be attributed to a direct effect of the auxin itself.

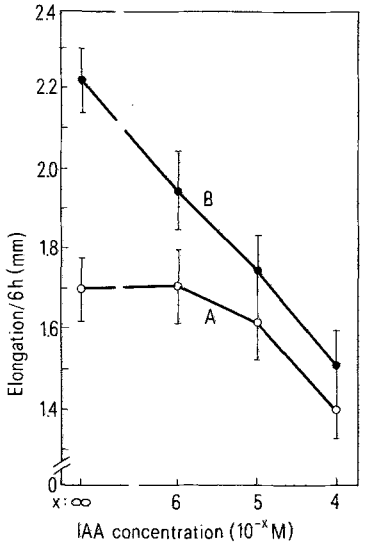

Figure 2. Elongation (in mm ± SE) after 6 h of apical maize root segments. Segments were incubated in a vertical position, in light (A) or in darkness (B).

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The transmembrane gradient of osmotic pressure modifies the kinetics of sodium currents in perfused neurons

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Summary. Sodium TTX-sensitive current was investigated in isolated, internally perfused neurons of rat spinal ganglia. The transmembrane osmotic pressure gradient was found to slow the kinetics of sodium current inactivation when the external osmolality was increased and to speed up the kinetics when the external osmolality was decreased.

Animal cells are usually good osmometers: the surface membrane is permeable to water and normally a steady-state osmotic pressure gradient cannot be created and maintained under normal conditions. However, with the comparatively small mammalian spinal ganglia neurons (diameter 20–30 μm) perfused through a pipette of 5–8 μm in diameter[1,2] an effective exchange of artificial solutions from both sides of the membrane is possible. It is large enough to ensure the removal of increased water flow through the membrane. As judged from the changes in ionic currents, the internal saline was completely substituted within 1 min. This rate is obviously sufficient to prevent accumulation or depletion of water in the cell. This was confirmed by measuring the size of the perfused cells (unchanged) while large osmotic pressure gradients were created. The volume control was done with screen displays of cell images received from a video microscope camera.

We have investigated the effect of the osmotic pressure gradient across the membrane on the sodium TTX-sensitive inward current using the method of intracellular perfusion. Neurons were isolated (in vitro) from rat spinal ganglia pretreated with pronase[2]. In some experiments the cells of mouse neuroblastoma C-1300 (clone N-18)[3] were investigated. The composition of the reference extracellular solution was: NaCl 30 mM, KCl 3.7 mM, $CaCl_2$ 2.6 mM, $MgCl_2$ 1.1 mM, Tris HCl 'Serva' 10 mM (pH 7.4), and TMA chloride 110 mM or nonelectrolyte (glucose, sucrose) 220 mM. The osmolality of the external solution at 20–22 °C was varied in both directions by changing the concentration of TMA from 0 to 500 mM or nonelectrolyte from 0 to 1 M. The intracellular reference solution contained 160 mM of Tris fluoride or phosphate (at pH 7.3). Its osmolality was increased by adding TMA, glucose or sucrose and decreased by the dilution. The direction of the osmotic pressure gradient was defined as 'positive' when the osmolality of external solutions exceeded that intracellularly and 'negative', vice versa. The data were digitized and the averaging procedure P/4[4] employed in order to subtract leakage and capacitance currents.

The changes is osmolality did not influence substantially either the I-V relationship or the h_∞ (V) dependence of the sodium current but were found to produce a prominent effect on its inactivation kinetics. Figure 1 demonstrates the changes in sodium inward current due to the 2-fold changes in the osmolality of external solution. When the direction of the osmotic pressure gradient was made positive, the rate