PLANT TUMOUR INDUCTION BY AGROBACTERIUM TUMEFACIENS: STRUCTURE AND FUNCTION OF THE T-DNA-ENCODED "ONCOGENIC PROTEINS". M.Van Montagu, D.Inzé, R.Deblaere[1], H.Joos, M. De Block, J.-P.Hernalsteens[1], A.Caplan, E.Messens, P.Zambryski and J.Schell. Laboratory Genetica, RUG, B-9000 Gent; [1]Laboratory GEVI, VUB, B-1640 Brussels, Belgium.

DNA sequencing of the T-DNA region of the octopine Ti plasmid pTiAch5 and the nopaline plasmid pTiC58 has facilitated the cloning of the individual T-DNA genes. The availability of efficient expression cloning vectors for plant cells allowed plant protoplasts and plant shoots to be transformed with these cloned T-DNA genes. Complementation studies and analyses of the kinetics of appearance of some plant growth regulators may indicate that a "simple" alteration of the level of these growth regulators could be responsible for the tumourous growth of crown gall cells.

CLASTOGENIC EFFECTS OF FIVE NAPHTO-NITRO-FURANS: IN VITRO INDUCTION OF MITOTIC ABNORMALITIES. W.Venegas, Cl. Lasne and I.Chouroulinkov. IRSC-CNRS - LRACC, B.P. No. 8, 94802 Villejuif Cédex, France.

We have shown that five naphto-nitro-furans used as antibacterial, protozoocidic and antihelminthic agents were mutagenic and carcinogenic in a series of mammalian tests. Here are presented their effects on chromosomes and on mitotic division stages.

Clastogenic effects were detected in vitro in V79 Chinese hamster cells using the classic chromosomal aberration test. Abnormalities of the mitotic stages were observed using the anaphase-telophase test. The former detected gaps, breakages, dicentrics, rings, tri- and tetraradial figures and pulverisations. The latter showed anaphase-telophase bridges with and without acentric fragments and tri- and tetrapolar figures. The most clastogenic substances were those which were also the most active in our previous studies, showing a good correlation between clastogen and mutagen detection tests.

Like the mutagenic activities, the clastogenic properties of these compounds are linked to their molecular structure and depend on the presence of a nitro-group in position 2. The efficiency of this nitro-group is enhanced by a methoxy in position 7 or 8 and is reduced by bromide in position 7.

EFFECT OF TPA ON MORPHOLOGY AND MOTILITY OF 10T½ MOUSE CELLS Hendrik Verschueren and Nicolas van Larebeke. Laboratory for Detection of Carcinogens, Pasteur Institute, 1180 Brussels, Belgium.

The tumour promoting phorbol ester TPA has been reported to alter the morphology of C3H/10T½ mouse embryo cells: they became smaller and refractile with long beady processes (1). In further studies on the effect of TPA on cell morphology we determined that cells treated with TPA at 0.1 µg/ml also showed prominent cytoplasmic lamellae at different localizations of the cell edge. Time-lapse video recordings showed these lamellae to extend and withdraw rapidly, resulting in a strongly increased stationary motility of the cells. Interference reflection microscopy showed that TPA treated cells can form normal adhesions on the substrate and a well developed network of stress fibres persist. We suggest that TPA does not disrupt the morphogenetic apparatus of these cells but interferes with its regulation.

(1) Boreiko et al., Cancer Res., 40, 4709-4716, 1980.