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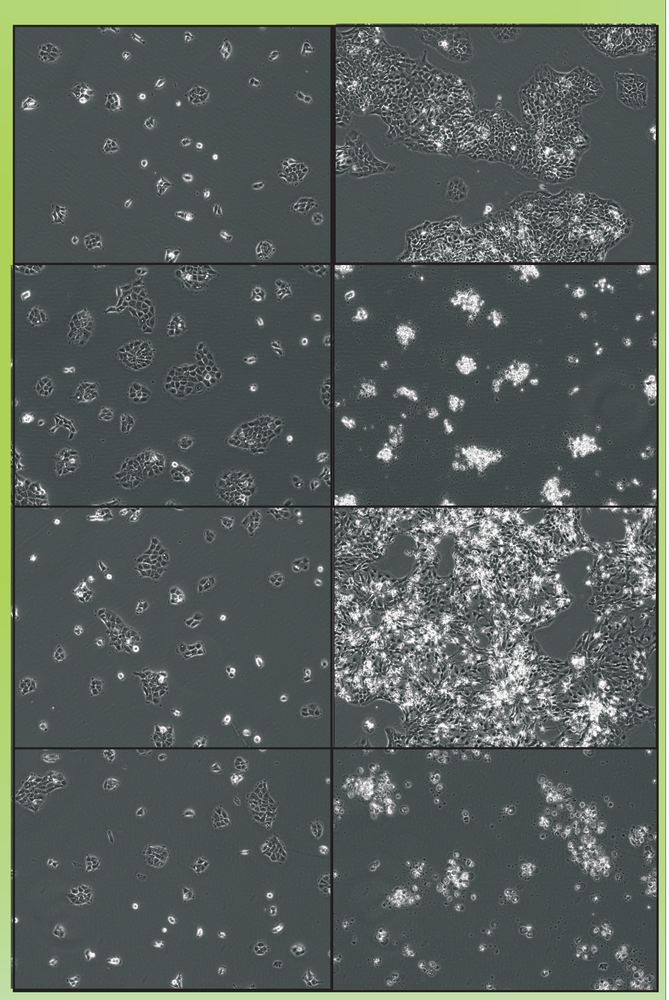
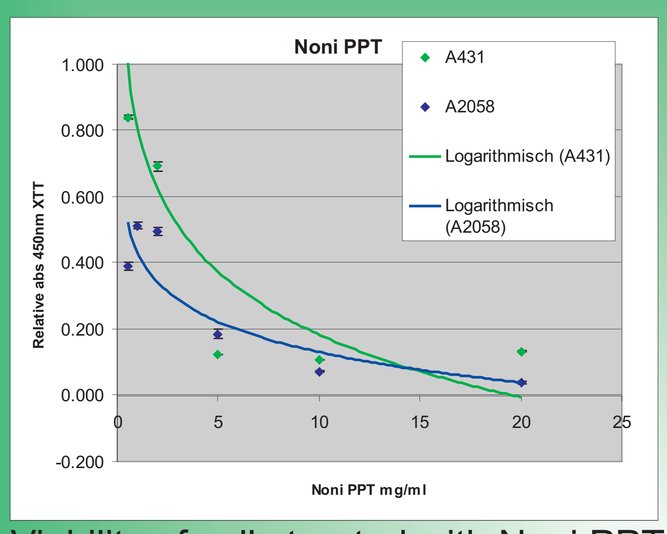
Motility of Squamous Carcinoma cells under the influence of chemotherapeutic agents.

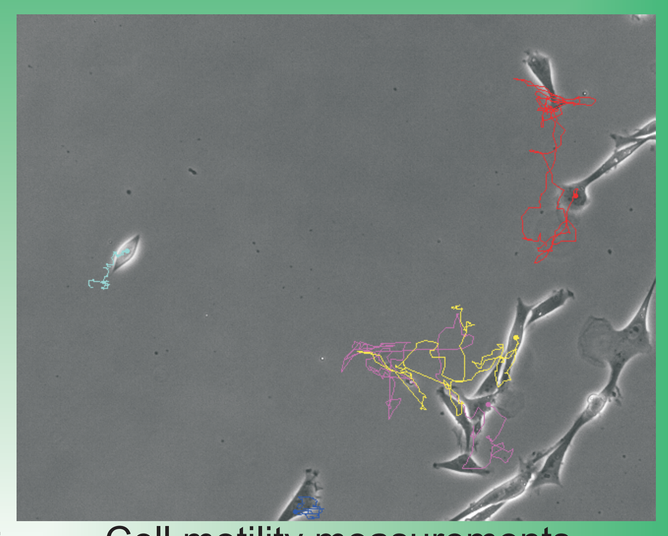
Introduction, Background and Aims:
Various chemotherapeutic agents (Cisplatin, Erbitox, Taxoter and NONI PPT(Goodnoni (tm) Gerald Walter Linz Austria)) were tested for their efficiency in an in vitro test system against known cell lines (A431 and RPMI 2650). Here we are developing a test system for known and new chemotherapeutic agents for the treatment of malignant cancers. The thus collected data are to be used as the basis for proposed future clinical testing.
A combination of vitality, motility and invasion studies will enable the determination of the compound's effectiveness on the cell line. It has been shown that resistance to chemotherapeutic agents may lead to an increase in motility and invasiveness as opposed to the desired reduction. This may lead to the induction of metastases and not to the desired effect of reducing the cancer. The various chemotherapeutic agents listed above were tested for their efficiency against the cell lines.

Timelapse assay of A431 cells treated with various chemotherpeutic agents

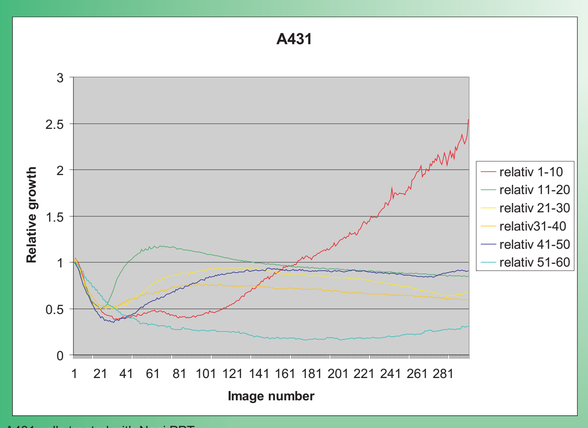




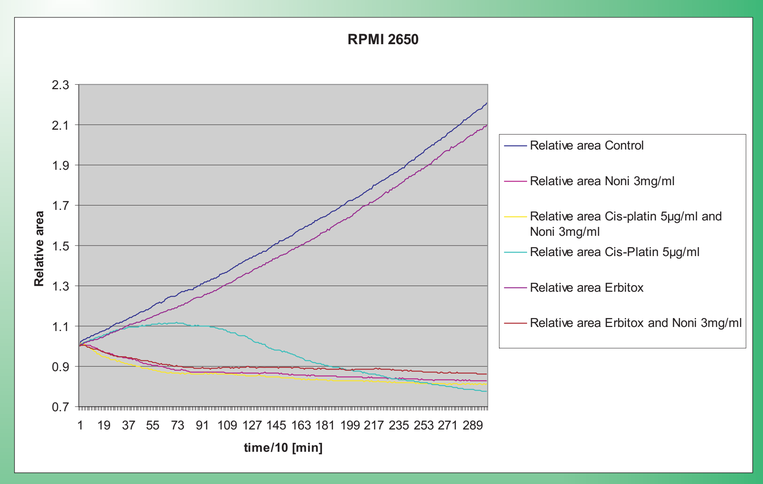
Viability of cells treated with Noni PPT



Cell motility measurements



A431 cells treated with Noni PPT
1-10 = control
11-20 =0.75 mg/ml
21-30 =1 mg/ml
31-40 =1.5 mg/ml
41-40 =3 mg/ml
41-50 =6 mg/ml
51-60 =12 mg/ml



Material and Methods:
Cell cultures of epithelial carcinomas were confronted with a series of chemicals at various concentrations to determine the change in vitality and motility using time-lapse micro-photography Treatment was with physiological concentrations of the chemotherapeutic agents to be investigated. It has already been shown that a concentration dependent effect on the motility of mouse and human melanoma cell lines can be observed (paper in preparation) with Noni PPT. The lethality is also concentration dependent and it also appears to be growth dependent.

Results:
It has been shown that this method is sensitive and demonstrates the ability to distinguish between different mechanisms of action of the chemotherapeutic agents used and indicate the mechanism by which NONI PPT kills cancer cells. The effectiveness of the treatment of cancer cells with chemotherapeutic agents is also seen to be dependent on the biochemical activity of the cells present i.e. growth, proliferation and motility. Combination tests show that the treatment effectiveness increases when two chemotherapeutic agents are used that work using different mechanisms.

Summary / Conclusion:
Three different mechanisms of cell death can be visually identified. The unknown mechanism by which NONI PPT kills cells can be visually allotted to a mechanism related to that of Taxoter a known cytoskeletal inhibitor of cell division. This is a type of cell death that appears to end in autoschizis. Invesitgations are underway to determine whether autoschizis and the type of cell death induced by taxoter and NONI PPT are related using the Vitamin K3 induction method.
It has been shown that this method can in a relatively simple way determine the mechanism by which cell death is induced and if the cells are responsive to the agents used.