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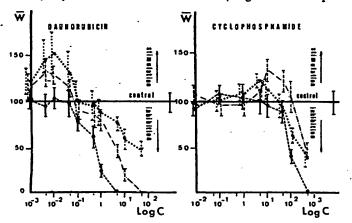
CANCER/ANTI-CANCER DUAL ACTION DRUGS IN CROWN-GALL TUMORS

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Material and methods: Germinating decapitated pea seedlings (*Pisum sativum* c.v. Annonay (Vilmorin)) experimentally infected with *Agrobacterium tumefaciens*, tumorigenic strain B₆, were used as already described (5). Drugs were dissolved in buffered physiological saline solution (pH 7.0) and filtered on a millipore filter before use. They were introduced into the wound either mixed with bacteria (time 0) or separately, by tissue scarification, at various times after start of bacterial infection (figure). On the 12th

day, tumors were excised and weighed and lengths of lateral shoots were measured. As the tumor weight increases, the length of shoots decreases. We calculated as described (5) for each plant an estimated tumor weight corresponding to non-existant lateral shoots. Fifty plants were used for each assay. Means of adjusted values were statistically compared with a confidence interval of 1%, according to Student's t test.

Results: The figure shows that, at low concentrations, cyclophosphamide and Daunorubicin act as tumor—stimulants when introduced into wounded tissues as early as 24 or 48 h following infection with A. tumefaciens (a 24 h lapse is needed for conversion of healthy plant cells into tumor cells). Four days after inoculation of B₆ strain (this is the time period during which the bacteria are no longer tumor-inducing) stimulation of neoplastic cell growth by both drugs can still be observed. At the same low concentrations, these drugs have no effect when introduced together with the bacteria at time 0, that is to say during induction of cancer tissue formation. At high concentrations, cyclophosphamide and Daunorubicin, which have apparently no damaging effect on plant growth (lateral shoot length measurements remain normal during the entire 12 days experimental period), show a strong tumor inhibiting action (figure). It must be emphasized that in the absence of bacteria neither of these drugs has any detectable carcinogenic effect under the experimental conditions we use.

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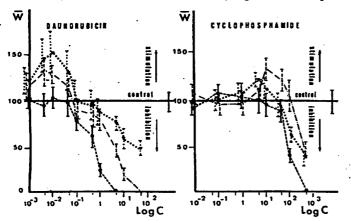
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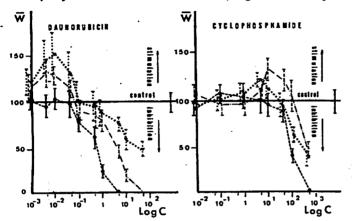
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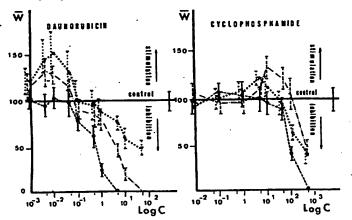
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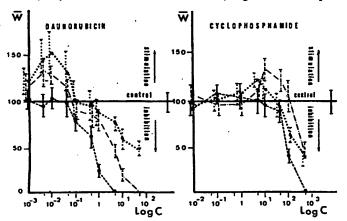
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