Failure of Inhibition of Polyoma Virus Replication by Distamycin A

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Distamycin A, Polyoma Virus

Distamycin A caused no significant inhibition of polyoma-virus growth or capsid and mRNA formation in embryonic mouse cells.

Distamycin A (DA), an antibiotic from *Streptomyces distallicus* [1], is known to interfere with the replication of some large DNA viruses, *e. g.* vaccinia virus [2], Epstein Barr virus [3], and herpes simplex virus [4] (own unpublished results). However, the reports on DA action on polyoma virus (PV), a small DNA virus, are contradictory in the literature: Verini and Ghione [2] were not able to find a significant effect, whereas later Castro *et al.* [5] reported inhibition of PV yield by the factor 10^2 and $10^{7.5}$ in the presence of 20 and 100 μM of DA, respectively.

We wish to report on some investigations of DA action on PV functions. DA was used in a concentration of 200 μM (Boehringer Co, lot 7943305). PV was a wild type (obtained from Dr J. Žemla, Bratislava) and the cells used were secondary mouse embryo cells (MEC).

Two types of experiments were performed.

1. MEC were infected with PV (5 pfu per cell) and DA was continuously present (medium once changed at 36 h p.i.) until cells and virus were harvested at 70 h p.i. We assayed for PV yield (hemagglutinin and infectivity) and capsid formation (immunofluorescence test) (Table I, columns A).
2. For investigation of the DA effect on the current virus-specific RNA formation in PV infected cultures the DA was not added until 60 h p.i., as described for experiments with cytosine arabinoside and SV40 and PV [7, 8]. Total RNA was labelled one hour later for a two hour period by addition of 5,6-(^{3}H)-uridine (40 μCi per ml) to the DA containing medium. RNA was isolated and 20 μg were hybridized with denatured PV DNA on nitrocellulose filters as described elsewhere [6] (Table I, columns B).

We observed no significant inhibition of PV growth and protein synthesis (Table I, A). The partial inhibition of total RNA formation in DA treated cells and also the finding that DA does not specifically interfere with the PV specific transcription (Table I, B) are in agreement with results in human fibroblasts infected with herpes simplex virus type 1 (A. Burger, G. Brandner, unpublished results).

In summary, our results provide no evidence for a significant inhibition by DA of PV replication. Thus, we are able to confirm the findings of Verini and Ghione [2].

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Table I. Effect of DA on PV replication.

	A: Continuous presence of DA			B: DA present 60–63 h p.i.	
DA [μM]	PV infectivity [$TCID_{50}$ per ml]	HA [titer]	PV capsid [% positive cell nuclei]	Spec. radioact. of total RNA [cpm $\times 10^{-4}$ per μg]	PV specific RNA [% of total RNA radioact.]
0	$10^{5.0}$	1 : 200	80–90	2.8	0.22
200	$10^{4.5}$	1 : 400	80	1.3	0.27

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