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Growth inhibition by DMSO

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Abstract

Growth inhibition by DMSO

Growth effects of cytochalasin B and DMSO on wild-type (74A). The data above the dotted line were obtained from cultures grown for 48 hrs at 32° C; below the lin., 66 hrs at 24-26° C. Both sets of cultures were reciprocally shaken (124 strokes per minute), and grown in 10 ml of medium in 25 ml erlenmeyer flasks. Mycelia were dried for 24 hrs at 70° C. Means are based on eight flasks each.

%DMSO (v/v)	CB (µg/ml)	mean dry wt. (mg.)	% of control
0	0	58.3	100
0.0002	0.001	64.4	110
0.002	0.01	66.8	115
0.02	0.1	64.7	111
0.2	1.0	63.0	108
2.0	10.0	48.6*	83
4.0	20.0	23.6"	40
0.0002	0	58.8	101
0.002	0	54.8	94
0.02	0	53.7	92
0.2	0	51.7	89
2.0	0	45.0	77
4.0	0	37.2*	64
.....			
0	0	55.8	100
0.1	0	56.9	102
0.1	0.001	57.2	103
0.1	0.01	56.2	101
0.1	0.1	63.6	114
0.1	1.0	55.6	100
0.1	10.0	50.6'	91
0.1	20.0	28.9"	52

* = Some spherical growth; ** = All growth spherical.

Chalmers (1974 *Neurospora Newsl.* 21: 20-21) has reported that 2% v/v Dimethyl Sulphoxide (DMSO) is inhibitory to wild-type *Neurospora* (74A). DMSO is the most favored solvent for the several cytochalasins currently being used in th. study of fungal morphogenesis. Betina and Micekova (1973 *Zeit. fur Allg. Mikrobiol.* 13: 287-298; 1972 *J. Gen. Microbiol.* 71: 343-349) used DMSO at a final concentration of 1% with several fungal species whll. testing the effects of cytochalasins A, B, and D (CA, CB, CD) at concentrations of up to 50 µg/ml. Thomas t al. (1974 *Nature* 249: 140-142) used 1% DMSO with 20 µg/ml CA in studying cellulase synthesis in *Achlya*. In investigations on hyphal morphogenesis in *Aspergillus*, Oliver (1973 *Protoplasma* 76: 279-281) used 20 µg/ml CB in 10% DMSO.

It is of some concern to those investigators studying the cytochalasins to clarify concentrations of which the solvent DMSO can confuse the data. Our findings, presented in th. accompanying table, confirm Chalmers' finding that 2% DMSO inhibits growth of wild-type strain 74A, and that at a concentration of 4% DMSO begins to mimic the morphological changes induced by relatively high concentrations of CB (10 µg/ml and higher). Concentrations of DMSO below 2% do not appear to obscure th. CB effects. Th. slight enhancement of growth by low concentrations of CB (with 0.1% DMSO) observed with 74A has been found to be magnified in certain morphological mutants; e.g., with snowflake, granular, and spmy (Allen, Aiuto and Sussman, in preparation).