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Antimetabolitc inhibition of mod-5

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Abstract

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Barratt, R. W. and P. St. Lawrence. Anti-metabolite inhibition of mod-5.

In 1964 St. Lawrence, Maling, Altwerger and Rachmeler (Genetics 50: 1384) reported the genetics and physiology of a gene designated as mod-5 (modifier of permeability) induced in a tryp-3 (td16) stock and concluded that all of the phenotypic manifestations of the mod-5 mutation can be rationalized as consequences of a change in permeability that facilitates the entry of a number of metabolites into the organism. They observed that mod-5 strains were completely inhibited by concentrations of the antimetabolites p-fluorophenylalanine and 4-methyltryptophane which had little or no effect on unmodified cultures.

The data in Table 1 (P. St. Lawrence) and Table 2 (R. W. Barratt) support the above observations and indicate that the use of these antimetabolites is a gwd method for scoring for the presence of the mod-5 mutation. The results are expressed as mycelial dry weight in milligrams from 72-hour stationary cultures (except where noted) grown in 20 ml of Vogel's minim I N containing 2% sucrose plus the indicated antimetabolite (added after autoclaving). The inoculum was approximately 10^8 conidia per flask.

Table 1. Inhibition of mod-5 by antimetabolites in cultures grown at 34°C.

Strain	p-fluorophenylalanine (conc. in ɣ/ml)		4-methyltryptophan (conc. in ɣ/ml)	
	0.1	1.0	1.1	11.0
wild type (isolate 2.3)	94.9	53.7	59.0	48.1
mod-5 (FGSC# 1603)	80.3	0.0	64.2	0.0
wild type (isolate 6. 1)	90.8	86.9	w . 2	71.1
mod-5 (isolate 6.3)	59. 1	0.5	13.2	0.0

Yield measured in mg dry weight. Data are averaged from triplicate flasks.

Table 2. Inhibition of mod-5 by antimetabolites in cultures grown at 25°C and 35°C.

Strain	Temperature	p-fluorophenylalanine (conc. in ɣ/ml)		4-methyltryptophan (conc. in ɣ/ml)	
		0.0	1.0	0.0	11.0
wild type (FGSC# 987)	25°C*	55.3	1.2	35.0	38.0
	34°C	48.6	34.0	70.5	43.9
mod-5 (FGSC# 1603)	25°C*	46.6	0.0	51.4,	0.0
	34°C	102.2	0.8	39.4	2.3

Yield measured in mg dry weight. *Harvested at 96 hrs.

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