

Growth inhibition *in vitro* of *Mycobacterium smegmatis* by ten *N*-aryl glycylic hydrazides

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ABSTRACT *N*-(4-amino-2-nitro-toluinyl) glycylic hydrazide and *N*-(biphenyl) glycylic hydrazide partially inhibited the growth of *M smegmatis* at 20 µg/ml and showed a total inhibition at 100 µg/ml. Replacement by a nitro or halogen group lowered the activity.

KEY WORDS *Mycobacterium smegmatis*; hydrazines; isoniazid

Nontuberculous mycobacterial infections are becoming increasingly important in human disease.⁽¹⁾ Moreover, the mycobacteria are developing rapidly resistance to the currently available drugs. Many *N*-aryl glycylic hydrazides were screened against *M tuberculosis*. and *N*-(*m*-toluidinyl) glycylic hydrazide was found to be more active than β-naphthyl analogues.⁽²⁾ In this study we screened ten *N*-aryl glycylic hydrazides against *in vitro* growth of *M smegmatis*.

MATERIALS AND METHODS

Test compounds were dissolved in saline and sterilized by passing through a Milipore filter (0.45 µm). Solutions were diluted in sterilized Youman's medium.

Mycobacterium smegmatis(ATCC 607) culture was obtained from American Type Culture Collection and maintained by regular subculture on Petrik's solid medium. Inocula (3 mm loopful) of 4-day-old culture in Youman's medium were floated on the surface of the medium (5 ml) containing the test compound. Tubes (19 × 150 mm) were sealed with paraffin and incubated at 37°C for

1 wk. Isoniazid was compared in parallel. Blank tube contained no test compound as control.

RESULTS

The substituted glycylic hydrazides containing tolyl residues were found to be potent inhibitors at concentrations of 50–500 µg/ml. Replacement by a nitro or halogen group lowered the activity. The results in triplicate were similar and presented in Tab 1.

Tab 1 Growth of *M smegmatis* in the presence of ten *N*-aryl glycylic hydrazides, using Isoniazid as standard.

Aryl group	Concentration (µg/ml)						
	1	10	20	50	100	200	500
β-Naphthyl	+	++	++	++	-	-	-
4-Chloro anilinyll	++	+	+	+	±	-	-
<i>o</i> -Nitro anilinyll	++	++	++	+	+	-	-
<i>m</i> -Nitro anilinyll	++	++	++	++	+	+	-
<i>p</i> -Nitro anilinyll	++	++	++	++	++	+	-
4-Amino-2-nitro toluinyl	++	+	±	-	-	-	-
4-Chloro-2-nitro toluinyl	++	++	++	++	+	±	-
4-Bromo anilinyll	++	++	++	++	+	+	-
Benzyl	++	++	++	++	+	±	-
Biphenyl	++	+	±	±	-	-	-

++ Equal growth as control; + less growth; ± slight growth; - no growth.

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