southeast of the optical center, roughly along the minor axis.

The disk component is assumed to lie within the fifth contour unit. If random polarization is assumed, its flux density, including both polarizations, is $S = 8.1 \times 10^{-26}$ watt $m^{-2}(cy/sec)^{-1}$.

There is no apparent radio source in the position of NGC 205, one of the two small companion galaxies of M 31. We can assign an upper limit of 0.6×10^{-26} watt $m^{-2}(cy/sec)^{-1}$ to any emission from this galaxy at 610.5 Mcy/sec. The other small companion galaxy, M 32, also has no source with flux density greater than 0.6×10^{-26} watt $m^{-2}(cy/sec)^{-1}$ associated with it.

JOHN M. MACLEOD
Vermilion River Observatory, University of Illinois, Urbana

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Genetics of Isoniazid Metabolism in Caucasian, Negro, and Japanese Populations

Abstract. *Trimodal frequency distributions for isoniazid inactivation were found in Caucasian and Negro populations. The frequency of "rapid" and "slow" alleles in Caucasian and Negro populations was similar and differed from that of a Japanese population.*

A bimodal distribution of Caucasian and Japanese populations with respect to isoniazid (INH) inactivation was found previously (*1*) by means of a serial dilution bioassay method. Other investigators (*2*) confirmed these results by the use of chemical tests for INH. Sunahara (*3*) employed a vertical diffusion bioassary for INH and found a trimodal distribution of INH inactivation among Japanese and other races from the Far East. He postulated (*4*) that "rapid" and "slow" inactivators were homozygous, that "intermediate" inactivators were heterozygous, and that neither allele was dominant.

We have now used a somewhat different vertical diffusion test (*5*) for measuring the concentration of biologically active INH in the serum of 116 Negroes, 105 Caucasians, and 209 Japanese. Serum specimens were obtained 6 hours after an oral dose of 4 mg of INH per kilogram of body weight. Each serum was assayed independently in this laboratory and by Sunahara. The results obtained in both laboratories were highly comparable. A trimodal frequency distribution was found for these three racial groups (Fig. 1).

The serum concentrations of biologically active INH used to segregate phenotypes into "rapid," "slow" and "intermediate" inactivators were as follows: "rapid" inactivators, 0.11 μg/ml or less; "intermediate" inactivators, greater than 0.11 μg/ml and equal to or less than 0.8 μg/ml; and "slow" inactivators, greater than 0.8 μg/ml. This phenotypic segregation was analyzed for agreement with the Hardy-Weinberg law of random mating without dominance. Table 1 shows the results of this analysis. The frequency of "rapid" and "slow" alleles among Negro and Caucasian populations is similar, but a marked difference exists in the frequency of the alleles in these populations and in a Japanese population.

Table 1. Analysis of isoniazid inactivation phenotypes.

Phenotypes observed*			Gene frequencies		Phenotypes expected			χ^2	p Value† (%)
R	RS	S	"R"	"S"	R	RS	S		
				Caucasian (N = 105)					
7	37	61	0.2429	0.7571	6.19	38.61	60.18	0.184	50–70
				Negro (N = 116)					
6	51	59	.2716	.7284	8.65	45.90	61.53	1.341	20–30
				Japanese (N = 209)					
108	81	20	.7105	.2895	105.5	85.98	17.51	0.702	30–50
				Caucasian and Negroes (N = 221)					
13	88	120	.2579	.7421	14.69	84.59	121.7	0.356	50–70

* R, rapid; RS, intermediate; S, slow. † Degrees of freedom = 1.

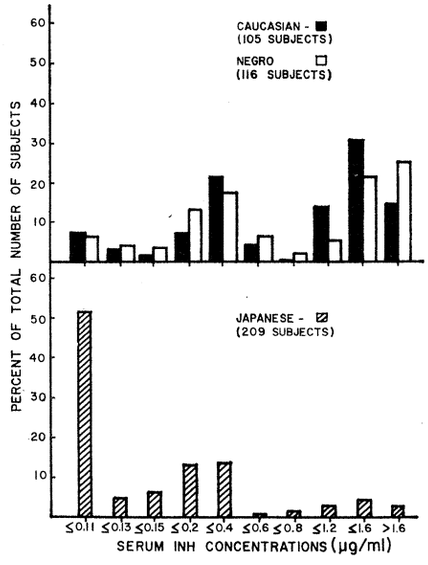

Fig. 1. Frequency distribution of INH concentrations in the serum of Caucasians, Negroes, and Japanese.

In Negroes and Caucasians the "slow" allele is approximately three times more frequent than the "rapid" allele. This instance is reversed in the Japanese, in whom the "rapid" is three times as frequent as the "slow" allele. There is good agreement between the number of observed and the number of expected phenotypes in these three racial groups.

These data confirm Sunahara's hypothesis that "rapid" and "slow" inactivators are homozygous, that "intermediate" inactivators are heterozygous, and that neither allele is dominant.

ALFRED P. DUFOUR
RALPH A. KNIGHT
H. WILLIAM HARRIS
Woman's Medical College of Pennsylvania, Philadelphia 29

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