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Radioprotective Sulfanilamides

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In previous papers [1a, b] it was shown that the sulfoguanidine has a radiosensitizing effect in Vicia faba, while the sulfamethazine has a feeble radioprotective effect. Thus, it seemed of interest to test the radiobiological action of the sulfanilamide compounds in animals too.

White mice males (from our own inbred strain) were exposed to 800 r acute whole body X-irradiations with a Siemens Therapy Unit. The radiation characteristics were: 180 kVP; 10 mA; 0.25 mm Cu-filter; FOD 50 cm; dose rate 66 r/minute. Six different sulfanilamide-compounds were investigated. Each drug was injected intraperitoneally 20 min prior to irradiation: 10 mg/animal as microcrystal-suspension in 0.5 ml saline. Treated lots = 20, irradiated control = 30 animals.

Table. Effect of sulfanilamides on mice irradiated by 800 r X-rays

		Mean body wt. in % of the initial wt. 0 5 10 15 days after irrad.				30	surviv at 30 days %	arith.	har- monic mean
4	sulfamethoxy- pyridazine	100	85	98		_	0	162 ± 45	165
2	sulfo- guanidine	100	78	115	115	118	10	273	224
3	sulfa- thiazole	100	89	85	109	109	15	± 130 261	203
ЬĄ	sulfanil- amide	100	95	92	90	95	30	± 91 389 ± 199	331
2.	sulfathio- carbamide	100	92	91	97	104	45	± 199 463 ± 213	451
C	sulfa- methazine	100	92	91	90	91	60	540 ± 216	_
	irradiated control	100	96	94	_	-	0	154 ± 59	

The Table shows that sulfoguanidine and sulfamethoxypyridazine have a radiosensitizing effect in the precipitous decrease of the body weight in the first 5 days only. The survivors quickly recovered their weight.

In contrast with these, the other four sulfanilamides show varying degrees of radioprotective activity. The most effective compound was sulfamethazine (2-sulfanilamido-4.6-dimethyl-

pyrimidine).

As to the mechanism of this radioprotection we can only assert, that a healing of the treated animals through the bacteriostatic action of the sulfanilamides is most unlikely, since the postirradiation administration of sulfanilamides is ineffective [2, 3].

As the sulfanilamides are a new class of radioprotective compounds and practically exempt of toxicity, our data seem to be of importance both in clinical radiotherapy and in theoretical researches. Work is now in progress in our laboratories to clear out the mechanism of radiobiological effects of sulfanilamides.

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^[1] LAZÁNYI, A.: (a) Naturwissenschaften 52, S 60 (1965); — (b) Intern. J. Rad. Biol. (1966) (in press). — [2] CASTER, W. O., et al.: Federation Proc. 17, 199 (1958). — [3] SMITH, W. W., et al.: Am. J. Physiol. 172, 351—358 (1953).