The Table shows the number of units tested in each species, and the number and percentage of such units which responded to irradiation. Here again, reservations concerning these values must be made because of the relatively small number of units studied. Also, no attempt was made to record from homologous areas of the olfactory bulb in the various species; sampling of units was random. It would appear, however, that a greater percentage of olfactory bulb neurons in the dog responded to irradiation as compared with the rabbit and cat. Previous work[9] resulted in percentages for the rat which are approximately the same as those observed for the rabbit and cat in this study.

All previous work on the response of olfactory bulb neurons to X-irradiation has been done on the rat. Similarly, rats have been used exclusively in behavioral studies which have demonstrated the ability of X-rays to arouse animals from sleep. With the exception of an experiment by TSYPIN and GRIGOR'YEV[12], in which rabbits were used, rats have been used in studies showing immediate EEG changes as a result of brief exposure to low-dose ionizing radiation. The present study demonstrates that olfactory bulb neurons of the dog, rabbit, and cat, as well as those of the rat, are capable of responding to X-irradiation. On the basis of previous work done on the rat[9,10], it is probable that these responses are the result of an effect of X-rays on olfactory receptors.

The total number of olfactory bulb neurons studied in the rabbit, dog, and cat are shown, along with the number and % of such units which responded to X-irradiation

	No. of neurons tested	No. of neurons responsive to X-rays	% of neurons responsive to X-rays
Cat	95	16	17
Rabbit	128	19	15
Dog	71	17	24

Zusammenfassung. Die durch Röntgenstrahlen (1 R/sec) erzeugten elektrischen Impulse einzelner Nervenzellen der Geruchszwiebel wurden in narkotisierten Katzen, Kaninchen und Hunden gemessen. Als typische Reaktion wurde eine kurzfristige Erhöhung der elektrischen Impulse gefunden. Somit sind die von Röntgenstrahlen ausgelösten elektrischen Impulse des Geruchsystems kein artspezifisches, sondern vielmehr ein allgemeines Phänomen.

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Survival of Stressed Rats Following Experimental Cardiac Necrosis

It has been demonstrated that isoproterenol produces infarct-like myocardial necrosis in rats[1]. The functional capacity of such hearts, as measured by cardiac output and work during overloading produced by polyvinylpyrrolidone infusion, is greatly reduced[2]. The present study was initiated to observe the effect of stress on the survival of rats with myocardial necrosis.

Male albino rats of the Carworth CFN strain were used. Weanlings were maintained on a normal chow diet, except for one group on a high fat diet[3]. All the animals weighed 350–400 g. Isoproterenol was injected at 3 mg/kg s.c. for 2 days and the rats were stressed on the third day. Stress consisted of hypoxia in a covered glass jar, swimming in 10 °C water or restraint by tying in a supine position for 24 h. All animals were autopsied at death, or 24 h after surviving the experimental procedure, and the hearts examined by a previously described method[1].

Isoproterenol produced grossly evident myocardial damage in each rat, while stress alone, or with the high fat diet plus restraint, did not result in myocardial injury. However, there was no significant difference in the length of survival between isoproterenol-treated and control animals following hypoxia, swimming or restraint (Table), indicating that the presence of myocardial damage did not increase the myocardial sensitivity to cellular anoxia sufficiently to affect survival. No animals died

The effect of stress on the survival of isoproterenol-treated rats

Treatment	No. of rats	Survival (range)
Isoproterenol	20	None dead
Isoproterenol + hypoxia	6	109 min[a] (90–136)
Hypoxia	6	112 min (92–118)
Isoproterenol + swimming (10 °C)	6	17 min[a] (13–25)
Swimming (10 °C)	9	20 min (17–25)
Isoproterenol + restraint	18	None dead
Restraint	18	None dead
Isoproterenol + high fat diet + restraint	14	3 dead[b]
High fat diet + restraint	12	None dead

[a] Not significantly different from stress alone at $P = 0.05$ using the Student t test. [b] Animals died 12, 15 and 22 h after the end of restraint.

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after restraint except 3 isoproterenol-treated rats of the high fat diet group.

It has been demonstrated that physical exertion protects rats against the cardiotoxic action of catecholamines, through a net uptake of myocardial potassium and a decrease in sodium[4]. It is possible that this mechanism was invoked by stress in our experiments, and may explain the similar survival rate of stressed rats with and without myocardial damage[5].

Résumé. Une nécrose myocardique a été produite chez le rat mâle adulte avec de l'isoprotérénol. Aucune différence de survie significative n'a été constatée entre les individus traités et les non traités lorsque les uns et les autres ont été soumis à l'hypoxémie, la nage forcée dans l'eau froide, ou la restriction par attache.

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Spermine and Spermidine Distribution During Wheat Growth

Very little information has been reported on the occurrence, distribution and metabolism of polyamines in higher plants[1]. Moruzzi and Caldarera found spermine and spermidine in wheat germ[2]. On the other hand, Bertossi et al.[3] and Bagni[4] showed that spermine $10^{-4}M$ and spermidine $10^{-5}M$ are growth-promoting factors for *Helianthus tuberosus* explants in vitro.

In this research we have studied the distribution of spermine and spermidine in wheat plant, variety 'Hard Red Winter', grown regularly in the field, and have followed the changes during growth. We have used, for polyamine determination, the method developed by Raina[5] with paper electrophoresis separation using sulphosalicylic acid buffer $0.065M$ at pH 3.5 and stained with amido black. Spermine and spermidine occur in all parts of the plant examined, except in the root and anther.

These polyamines (see Table) are present in unfertilized ovules and rapidly increase, given as γ/unit, after fertilization. When the caryopsis is formed, but still in the milk stage, these polyamines occur not only in the embryo, but also, and in greater relative content, in the remaining parts of caryopsis. In the embryo of mature caryopsis (seed), spermine and spermidine increase especially in respect to the remaining part of caryopsis.

The determination on 170 mg of fresh weight of pure pollen grain has shown that spermidine is present in appreciable quantities while spermine appears only in traces. No significant changes of polyamine contents were noted in leaves before and after the fertilization of ovules.

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Spermine and spermidine distribution in wheat plant

	Ovules unfertilized	Ovules fertilized		Milk stage caryopsis		Mature caryopsis (seeds)		Pollen grains	Leaves		Culms	Plants 1 month old
		After 6 days	After 20 days	Embryos	Remaining parts	Embryos	Remaining parts		1 month before fertilization	1 month after fertilization		
Spermine												
γ/g fresh weight	25.0	21.0	12.4	67.7	4.9	399.8	7.2	traces	5.3	5.6	traces	16.0
γ/g dry weight	210.0	105.0	53.2	310.0	17.2	444.7	8.0	traces	16.2	16.7	traces	110.8
γ/unit	0.029	0.143	0.208	0.075	0.177	0.381	0.220					5.0
Spermidine												
γ/g fresh weight	87.5	33.0	51.0	125.0	8.0	853.9	18.1	27.6	8.8	9.1	traces	21.3
γ/g dry weight	735.0	165.0	218.0	574.0	27.6	949.8	20.1	212.1	26.5	27.1	traces	146.6
γ/unit	0.100	0.224	0.854	0.139	0.309	0.815	0.555					6.7
Spermidine/ Spermine	3.50	1.57	4.09	1.85	1.61	2.14	2.50		1.66	1.62		1.34
% dry weight	11.9	18.9	23.3	21.8	29.0	86.3	87.2	13.0	32.7	33.5	28.0	14.4