A new approach for a pyrogen test

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Using a sensitive oxygen sensor cell a correlation has been found between a rise in body temperature and increased oxygen consumption in experimental animals injected with pyrogenic substances.

Oxygen consumption was measured with individual rabbits or groups of six mice in a controlled environment and air flow and the oxygen concentration in the outlet was measured continuously with a sensitive oxygen sensor developed in the City University, London.

In rabbits injected intravenously with pyrogenic substances, measurement of body temperature with a rectal probe and oxygen consumption were carried out simultaneously. Results with the two methods correlated well:

$$V_T R = V_T Xss + Q \quad (1)$$

$$\Delta t = \frac{V_T(Xss - X^1SS)}{PQ} \quad (2)$$

where V_T = air flow rate in cc/min, R = % oxygen in the inlet, Q = oxygen consumed by the animal before injection in cc/min and P = % increase in metabolic rate/°C rise in body temperature = 13%.

Similar oxygen consumption studies were carried out on groups of six mice prewarmed for 1 h at 37°C. When the IRP was injected intravenously into mice, the mean rise of calculated body temperature with 15 μg/kg (six experiments) was 0.91°C (±0.08) and with 1.5 μg (five experiments) was 0.53°C (±0.07).

Thus results of preliminary experiments suggest that measurement of the metabolic response of mice to a pyrogen using a non-contract method might form the basis of an alternative pyrogen test.

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Pyrogen	Dose (μg/kg)	Rise in body temperature, Δt (°C) Calculated from oxygen consumption	Rectal probe
Shigella	0.5	0.64	0.71
endotoxin	2.4	0.52	0.50
	11.5	0.88	0.86
IRP	0.025	0.83	0.82
		0.86	0.85
	2.5	1.88	1.75
		0.68	0.63

IRP = International Pyrogen Reference Preparation (Shigella dysenteriae).

A technique for the investigation of the effects of drugs on hearing

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The compound action potential of the auditory nerve and mid-brain nuclei in response to sound can be recorded from surface electrodes applied to the ear and the vertex of the head. These responses, known as the electrococochleogram (E.C.O.G.) were described by Sohmer & Feinmesser (1967) and have been used in man and animals to investigate hearing.

We have found, as did Lev & Sohmer (1972), five waves in these recordings. They showed that the first wave is the surface manifestation of the cochlear nerve action potential. The second wave comes from the cochlear nucleus, the third from the superior olivary complex and the fourth and fifth from the inferior colliculus. Within limits, the louder the sound the larger the amplitude and the shorter the latency of each wave. Both tend to saturate.

The presence, amplitude and latency of each wave in response to incremental increases in sound intensity has been used in man to investigate function. In animals, anaesthesia has always been used and this may alter the responses.