Inhibition of whole cell respiration by tobacco smoke fractions is in agreement with other reports[10,11]. Adverse effects of microgram quantities of tobacco smoke fractions on mitochondrial oxidases suggest an interaction of tobacco smoke constituents with the mitochondrial electron transport chain components as well as associated enzymes. Complexity of similar interactions of tobacco smoke with purified yeast alcohol dehydrogenase has been reported[12,13]. Recently, fractions have also been isolated from tobacco smoke condensate which cause enzymatic inhibition by binding the essential metals[14].

Our preliminary studies indicate that the WS fraction from tobacco smoke condensate inhibits yeast growth by interference with the respiratory metabolism of the cells. Since the tobacco smoke and its fractions have complex chemical composition, the mechanism of their inhibitory action can be better understood only when subfractionation and identification of the constituents have been achieved.

Zusammenfassung. Das aerobische Wachstum der *Saccharomyces carlsbergensis* wird bei Anwesenheit des wasserlöslichen Tabakrauchkondensates im Laktat Nährmedium stark gehemmt, obwohl eine Wachstumshemmung im Glukosemedium nicht stattfindet. Mikrogrammengen des Kondensatanteils hemmen die Atmung intakter Zellen sowie diejenige isolierter Mitochondrien der Hefe.

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Peripheral Inhibition in Sustained and Transient On-Center Ganglion Cells in Cat Retina

Over the past 8 years research from several laboratories[1–7] indicates that on-center retinal ganglion cells of the cat can be divided into 2 groups. The 2 groups have been referred to as X and Y cells[1,7], Type I and Type II cells[3,5], Group I and Group II[6,8,9] or as sustained and transient cells[2,4]. We shall adopt the language of Cleland, Dubin and Levick[2] and refer to these units as *transient* and *sustained* cells. The criteria that we use for categorizing these cells have been described in detail elsewhere[6,8,9].

The purpose of the present study was to assess interactions between the central (on) and peripheral (off) regions of the receptive fields of on-center transient and sustained cells. The study differs from other center-surround interaction investigations[6,10] in that it deals specifically with the temporal characteristics of the interactions.

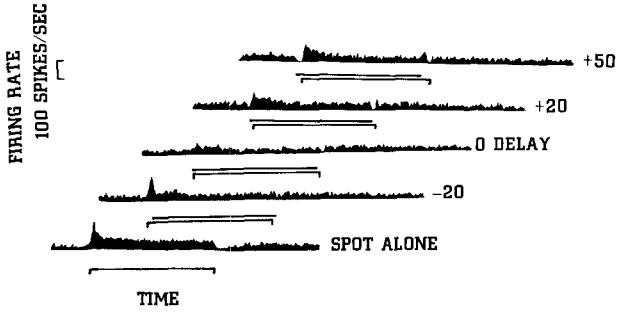

Fig. 1. Time series for typical sustained cell. Average response histograms are generated from 15 stimulus repetitions. Negative numbers indicate that the onset and termination of the center spot preceded that of the annulus; positive numbers signify that the annulus was presented first. All times are in msec. The lowest trace shows the response to the center spot presented alone. Background illumination is 0.3 candles/m^2. All targets are 1.2 log units above threshold.

Single cell recordings were made from 97 optic tract fibres of lightly anesthetized cats. Details of the recording system, optical system, and animal preparation can be obtained by referring to Winters, Hickey and Pollack[8]. The targets for the study were a 0.8° spot flashed in the receptive field center and a concentric 4.0° × 10.5° annulus. The temporal relation between these 2 targets was varied over a 150 msec range. Both the spot and annulus were square wave modulated (in time) with a duration of 1 sec and frequency of 0.3 cycles/sec. The targets were superimposed upon a diffusely lit tangent screen located 80 cm from the cat's eyes. Thresholds for the spot and annulus were determined separately and the intensity of each target was adjusted so that it was 1.2 log units above threshold.

Average response histograms for a typical sustained cell are shown in Figure 1. The lowest trace in the figure shows the response of the cell to 0.8° spot in the receptive field center. The other 4 traces give the responses to the same spot presented in conjunction with a 4.0° × 10.5°, concentric, annulus flashed in the receptive field periphery.

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Negative numbers signify that the onset and termination of the center spot precedes the annulus, whereas positive numbers indicate that the annulus precedes the spot in time; zero delay means that the spot and annulus were presented simultaneously for the full duration of the stimulus. The delay (in msec) between the spot and annulus which leads to the greatest amount of suppression of the on-discharge will, henceforth, be referred to as the *best delay* for the cell. The best delay for the sustained cell of Figure 1 is zero. It can also be seen from the figure that the amount of suppression diminished for delays that are either shorter (spot leading annulus) or longer (annulus leading spot) than the best delay. The mean best delay for 51 sustained cells was found to be 7.32 msec (S.D. = 3.8), with the annulus leading the spot.

The average response histograms of Figure 2 illustrate the effect of stimulus timing upon the responses of a typical transient cell. As was the case for sustained cells there is a clearly defined best delay and there is an increase in response strength of the on-discharge as delays become shorter or longer than the best delay. The best delay for the cell in Figure 2 is 40 msec, with the annulus leading the spot. The mean best delay for 46 transient cells was determined to be 38.4 (S.D. = 5.9).

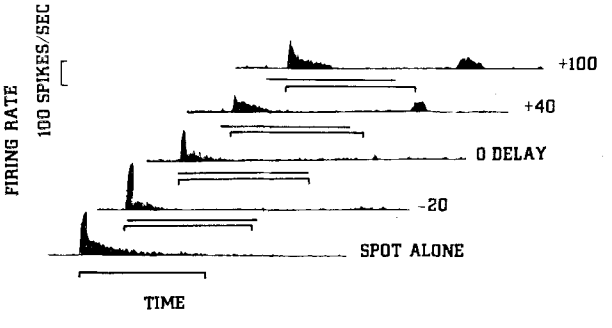

Fig. 2. Time series for typical transient cell. Refer to Figure 1 for details of stimulating procedure.

This mean is significantly ($p < 0.001$) larger than the mean best delay for the sustained cells. Although there is a clear difference between the best delay for suppression of the on-discharge, we were not able to find systematic differences between the off-discharges of these two cell types.

The results of several studies[3,6,11] suggest that the peripheral inhibition is stronger in sustained cells than in transient cells. In view of the findings of the present study, these earlier results may require reinterpretation. For example, FUKADA[3] reports that sustained cells give weaker responses to diffuse light than transient cells. The natural inference from this finding is that peripheral inhibition is weaker in transient cells. It must be pointed out, however, that the stimulus conditions of the FUKADA study favor peripheral inhibition in the sustained cell because the center and surround were stimulated simultaneously. If the periphery had been stimulated 40 msec earlier than the center, the transient cells would probably appear to have stronger surround inhibition. We find no evidence for differences in surround inhibition in transient and sustained cells when cells are compared at their best delays.

Zusammenfassung. Die Resultate deuten darauf hin, dass nicht, wie bisher vermutet wurde, die Stützzellen schwach auf Diffuslicht reagieren, sondern dass unter bestimmten Umständen die Inhibition stärker bzw. schwächer sein kann.

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Different Pathways for Hepatic Uptake of Taurocholate and Indocyanine Green

Transport across the sinusoidal membrane of the hepatocyte represents the first and least well known step in the biliary excretion of many organic anions. Studies on the hepatic handling of sulfobromophthalein in the dog[1] and of indocyanine gree in the rat[2,3] indicate that the hepatic uptake of anionic dyes is dependent on a saturable transport system obeying MICHAELIS-MENTEN kinetics. Although bile acids may be regarded as the most important organic anions which are excreted into the bile, the mechanisms governing their removal from the blood are insufficiently understood. Only recently it has been shown that the kinetics of hepatic bile acid uptake are also compatible with carrier-mediated transport[4-6]. It is not clear, however, whether anionic dyes and bile acids enter the hepatocyte via one or more pathways. Multiple mechanisms have been suggested for the biliary excretion of organic anions[7]. Thus, it appears possible that different pathways exist for the hepatic uptake of bile acids and anionic dyes. To test this hypothesis, the kinetic parameters of hepatic uptake of taurocholate and of indocyanine green were compared in the perfused rat liver, and it was investigated whether competitive inhibition phenomena are present when both anions are administered together.

Materials and methods. Male SPF-rats of the Sprague Dawley strain weighing 344 ± SD 37 g and maintained on a standard rat diet (Altromin 300 R) were used as liver donors. The liver weight averaged 3.4 ± SD 0.3% of the body weight.

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