<u>Gall, A. and G. Lysek</u>	Rubidium chloride (RbCl) causes a marked reduction of the linear growth rate and induces mycelial banding in Podospora			
	anserina, (Lysek and Schrufer, Ber. Deutsch. Bot. Ges., in			
Induction of circadian conidi-	press). In <u>Arthrobotrys</u> <u>oligospora</u> , Rb ⁺ induces a light-dark-			
	dependent rhythm of conidiation (Lysek and Nordbring-Hertz, 1981,			
ation by rubidium chloride.	Planta, in press). The effect of the Rb-ion is ascribed to the			
	plasmalemma-ATPase, which transports \mathbf{K}^{+} into the cytoplasm and			
	extrudes protons. $\mathbf{Rb^+}$ is transported more slowly than $\mathbf{K^+}$ and			
	thus reduces the extrusion of the countertransported protons			

(Conway and Duggan, 1958. Biochem J. <u>69</u>: 265). Recent investigations by Lysek and Jennings (unpubl.) yield ed evidence that an increase of the cytoplasmic proton concentration is involved in fungal rhythmic growth and differentiation. Owing to the known circadian rhythm of conidiation in the <u>band</u> mutant of <u>Neurospora</u> crassa, Rb^+ was tested with this fungus.

Experiments were performed utilizing the <u>csp-2</u> strain (FGSC #2525) in continuous dark (DD), lightdark-cycles of 10:14 h (LD), or continuous light (LL). The best results were obtained using a minimal medium supplemented with vitamins and 6 g D-fructose/l. (Esser, 1969, Neurospora Newsl. 15: 27).

At 60 nM, Rb⁺ reduces the linear growth rate and induces banding of conidiation (Table 1). Crucial for determining whether rhythms are circadian is their behavior in light-dark regimes and their temperature compensation. Table 1 shows that the Rb⁺-induced banding reacts as expected for a circadian character in that it shows the endogenous period in DD, the entrainment in LD, and the suppression of the rhythm in LL.

TABLE 1

Effect of RbCl on growth rate and conidiation pattern in different light regimes

		LD	DD	LL
Control	growth rate (mm d ⁻¹) at 27°C	42, 1	41, 9	41, 2
	banding	no bands	no bands	no bands
60 nM RbCl	growth rate			
	(mm d ⁻¹) at	18, 5	22, 6	14, 5
	27°C			
	bandi ng	bands	bands	no bands
	Period (h)			
	at 27°C	24, 1	21.7	
	at 22°C	24, 3	24.4	

The question of temperature compensation is somewhat uncertain though, since Rb^+ affected the viability of <u>csp-2</u> at temperatures differing too much from 20° C. However, the data obtained at 22 and 27° C give evidence that the endogenous period of the induced rhythm does not differ too much from 24 h in this temperature compensated. In sum, these experiments show that the circadian conidiatian can be triggered artificially and that it resembles other fungal rhythms in this aspect. (Supported by the Deutsche Forschungsgemeinschaft, Bonn-Bad Godesberg.) - - - Institute of Systematic Botany and Plant Georgraphy, Free University, Altensteinstr. 6, D-1000 Berlin 33, F.R. Germany.