On the relation of the activity and contraction of actomyosin threads.

by

T. ERDŐS.

The object of my experiments was to determine the relation of the % activity of the actomyosin and the contraction of the threads. In order to obtain comparable results threads of equal diameter have to be used and the thread should have the same concentration of protein. It is not possible to use in the whole series of experiments threads of the same protein content. Threads of low protein concentration cannot be pulled from an actomyosin of low activity. Threads of highly active actomyosin contract rapidly only at a low protein concentration and become sluggish if the protein concentration is high. For this reason under 50 % activity I used threads of 1,6 %, above 50 % threads of 0,9 % protein content. The diameter was throughout 0.25 mm. The actomyosin was prepared from recrystallised myosin and actin. The actomyosin contained 0,5 *M* KCl and was squirted through a capillary into 0,05 *M* KCl containing 0,001 *M* $MgCl_2$. The contraction was measured by following the length of the thread in a 0,02 *M* pH 6,7 potassium phosphate solution containing 0,001 *M* $MgCl_2$ to which 0,16 mg ATP was added after the thread was soaked in the salt solution.

Two series of experiments were performed. In the first I compared threads made from actomyosin of 10, 20, 30, 40 and 50 % activity. In the second I compared threads made from actomyosin of 50, 100, 170 % activity.

The results were the following: up to 40 % activity the contractibility increased with the activity (see fig. 1.). Threads prepared from 40 and 50% active myosin give the same contraction. Threads of 50, 100 and 170 % active myosin, also give identical results.

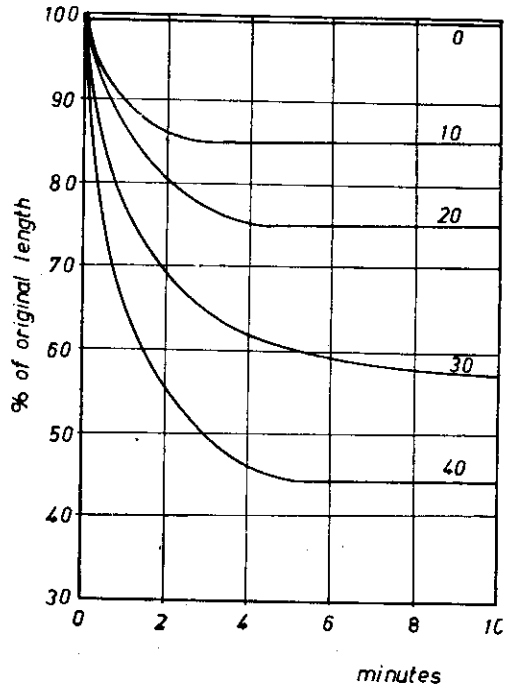

Fig. 1. Contraction of actomyosin threads of actomyosin of different activity. The numbers on the curves indicate the % activity of the actomyosin.

Summing up, thus, it can be said that the contractibility of actomyosin increases with increasing activity up to 40 % activity; 40 % actve myosin containing 6,5 parts of actin to 93,5 parts of myosin gives maximal contraction.