

Persistence length of distinct actin isoforms

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The physiological differences of actin isoforms in living cells are well studied. However, differences in basic mechanical properties of the isoforms *in vitro* have not been investigated yet. Therefore, the persistence length of 3 different actin isoforms was determined in the presented study. Skeletal α -actin was extracted from mammalian cells, cytoplasmic β - and γ -actin were produced by yeast and modified so that they were more similar to vertebrate actin. To determine the persistence length, actin was polymerized into single filaments and fluorescently labelled with phalloidin. The movements of the filaments in a plane were recorded with a confocal fluorescence microscope and the persistence length could be determined from their shape by using a corresponding software [1].

Differences in the persistence length of the isoforms were found, especially between β - and γ -actin. Overall β -actin has a higher persistence length than γ -actin, but the results are also much more variable than those of γ -actin. This suggests a higher sensitivity of β -actin to external influences.

[1] Graham, J. S., McCullough, B. R., Kang, H., Elam, W. A., Cao, W. & De La Cruz, E. M. Multi-Platform Compatible Software for Analysis of Polymer Bending Mechanics. PLoS ONE, 9(4), e94766. doi:10.1371/journal.pone.0094766 (2014).