Modelling the rheology of muscle contraction using a Kohlrausch function

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In the study of muscle rheology, the Kohlrausch function has been used to model and analyse their relaxation behaviour. The stress relaxation of bone collagen fibres was successfully modelled as a linear combination of a Kohlrausch function and a exponential function. Such results represents strong motivation for the use of the Kohlrausch function in the modelling of relaxation processes for bio-polymer materials. The aim of this paper is to briefly review the history of muscle rheology, summarise some important key properties and applications of the Kohlrausch function and to examine its use in modelling the response of a muscle to sudden length changes in quick release experiments. On the basis of the results of Huxley and Simmons (1971), a new model is proposed for the analysis of the data from quick release experiments and solved computationally.