

Doctoral thesis

ON QUANTITATIVE MUSCLE PROTEIN DETERMINATION
Sarcoplasm and myofibril content of normal and atrophic muscles.
By Einar Helander. 99 pages with 19 figures and 16 tables.

1957, Gothenburg: Acta Physiologica Scandinavica, volume 40, Supplement 141.

From the Department of Biochemistry University of Uppsala (Chief: Prof. Arne Tiselius, and the Department of Anatomy, University of Gothenburg (Chief: Prof. Bo Ingelmark).

Professor Tiselius was the Nobel Prize laureate in chemistry in 1948. President of the Nobel Foundation 1960-71. Professor Ingelmark was the Rector of the Gothenburg University 1966-72.

Review by P.G Walker, The Journal of Bone and Joint Surgery, 41-B (2): 450: 1959.

“This short monograph provides an excellent example of the enormous increase in the significance of the results of chemical analysis of tissues which is achieved when the figures can be related to tissue morphology on the one hand and to physiological function on the other. A technique based on differential extraction by salt solutions, has been devised for separating muscle protein in three fractions. Histological control showed that three fractions were derived from sarcoplasm, myofibrils and stroma, respectively and that the yields were quantitative. The metabolic activities of muscle take place in the sarcoplasm. The myofibrils are the contractile units and the stroma acts as a matrix for these elements.

The results are given of analyses obtained from different types of muscle and from the same muscle at different ages or after denervation or immobilization. The figures are correlated with the histological picture and interpreted in terms of variations of function. The author is commendably critical of his experimental methods and has tested carefully the effect of many variables in the techniques employed. Confidence in the results given by the methods finally adopted is correspondingly increased. A study such as this in which morphology, biochemistry and physiology meet is a model for a new and enlightened approach to the chemical analysis of tissues. “