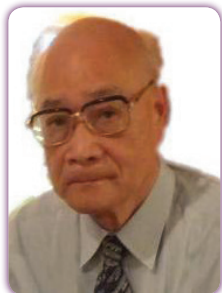


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### **Evidence for the absence of rigor linkage during the ATP-dependent cyclic actin-myosin interaction in muscle as revealed by experiments using the gas environmental chamber**

Using the gas environmental chamber, which enables to record dynamic structural changes in hydrated muscle contractile proteins, retaining their physiological function, already successful recording of ATP-induced myosin head power stroke in the mixture of actin and myosin filaments has been achieved. During the course of the experiments, myosin heads were position-marked with gold particles via a monoclonal antibody (IgG) to junctional peptide between 50K and 20K fragments of myosin heavy chain (anti-MH antibody). Since binding of anti-MH antibody completely covers two main actin-binding sites of myosin head, success in recording myosin head power stroke suggests the possibility that, during cyclic actin-myosin interaction coupled with ATP hydrolysis, myosin heads may not pass through rigor configuration, in which myosin heads bind tightly with actin filaments. To explore this possibility, the effect of anti-MH antibody on (1) ATP-dependent actin filament sliding on myosin heads fixed to a glass surface, and (2) Isometric force generation and shortening of Ca<sup>2+</sup>-activated skinned muscle fibers was examined. It was found that anti-MH antibody (up to 2 mg/ml) showed no appreciable effect on both (1) and (2). These results may constitute evidence that, contrary to the textbook view, myosin heads do not form rigor linkages with actin filaments during muscle contraction.

### **Biography**

Haruo Sugi completed his PhD at the age of 28 years from the University of Tokyo. He worked in Columbia University and the National Institute of Health from 1965 to 1967. He was a Professor in Physiology in Teikyo University from 1973 to 2004, when he became Emeritus Professor.

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