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The mechanism of load detection in the molecular motor myosin VI

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Myosin VI is thought to act as both a molecular transporter and as an anchor in vivo. Recent results demonstrate that a rigid isolated alpha helix extends the myosin VI lever arm, generating an unexpectedly large stroke size of approximately 30 nm. Here we use single-molecule fluorescence, optical trapping, and gold nanoparticle tracking to examine the role of the lever arm extension in both myosin VI translocation and anchoring. Our results suggest that the rigidity of this unusual structural element plays an essential role in load-induced anchoring.