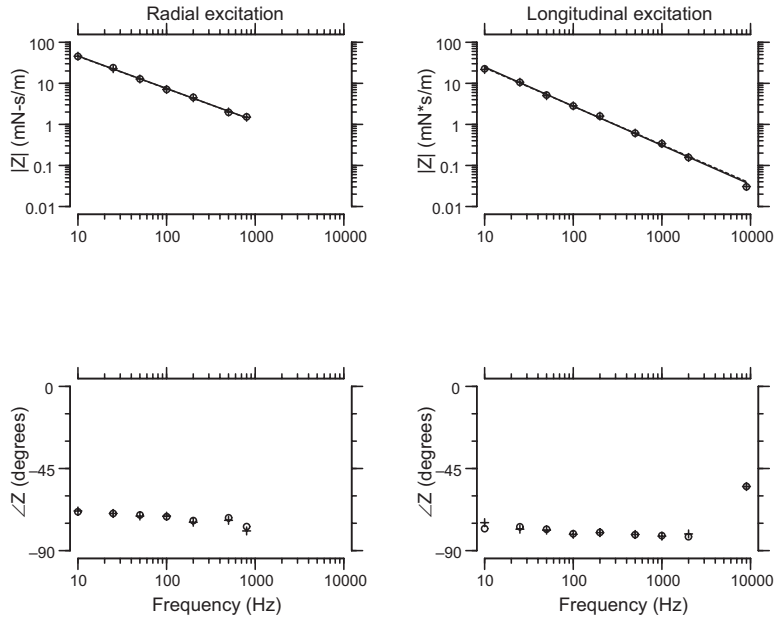

Figure 1: Repeatability of shear impedance measurements. These plots show the magnitude and phase of shear impedance of a single TM in both the radial and longitudinal directions, measured at two sequential times. Measurements were made at all stimulus frequencies in both directions before the process was repeated. For a given stimulus frequency and measurement direction, roughly 3.5 minutes elapsed between measurements. On average, both the magnitude and phase of impedance differed by less than 3% between measurements. Only a single pair of measurements in each direction gave impedance magnitudes and phases that differed by more than 5%.

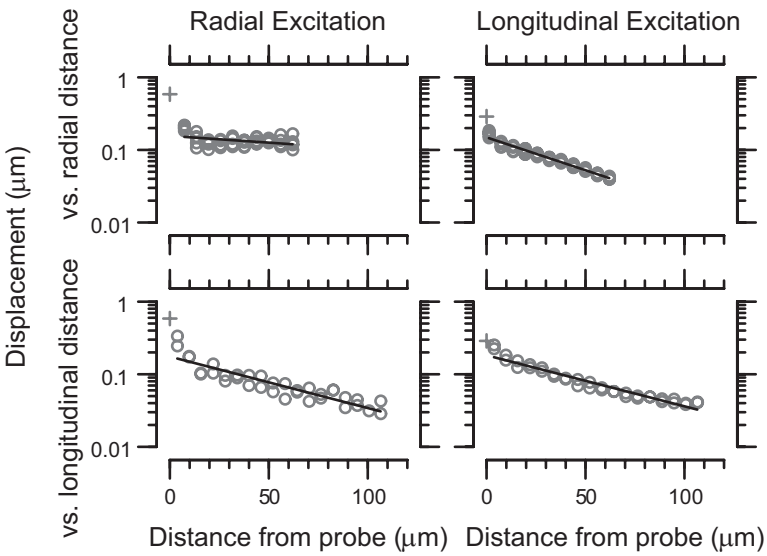

Figure 2: TM displacement versus distance from probe. These data are from TM preparation 2 at 100 Hz. The + symbols represent the magnitude of probe motion. The ∘ symbols show the magnitude of TM displacement vs. distance from the probe, and the solid lines are least-squares exponential fits to measurements made at least 20 μm from the probe. For this particular TM, the displacement vs. radial distance did not fall significantly with distance when the probe was driven radially. For all other combinations of force application and motion propagation directions, the displacement fell with distance in an approximately exponential fashion. This decrease was characterized by a space constant, which is defined as the distance over which the magnitude of displacement fell by a factor of e. Space constants were characterized in both the radial and longitudinal directions for both radial and longitudinal forces. Separate measurements were made at each stimulus frequency. For radial forces, these space constants were 56 ± 37 μm ($n = 18$) in the radial direction and 49 ± 22 μm ($n = 40$) in the longitudinal direction. For longitudinal forces, these space constants were 37 ± 22 μm ($n = 31$) in the radial direction and 62 ± 24 μm ($n = 47$) in the longitudinal direction. Paired t-tests performed on measurements from individual TMs revealed no significant dependence (at the $p < 0.05$ level) of space constant on either the direction of force application or the direction of propagation. No systematic dependence of space constant on stimulus frequency was seen in this study. Averaged across all measurements, space constants were 52 ± 27 μm.