

## Supplementary Material

**Table S1. Ionic composition of the bathing fluid and SFICM**

Ax2 cells were introduced in the shear flow chamber in Sørensen buffer, then the buffer was exchanged for the indicated ones at low shear stress and after 3 min, high shear stress was applied ( $\sigma = 2.4$  Pa). SFICM was recorded and measured as explained in Materials and Methods. The first four solutions test for the involvement of  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  in SFICM. The last fours show that  $\text{H}^+$  marginally influences SFICM. It should be noted that cells detach from the surface at pH larger than 7.5.

Bathing solution	Speed ( $\mu\text{m}/\text{min}$ )	Directionality
20 mM MES-NaOH, pH 6.5	$10 \pm 2$	$0.8 \pm 0.1$
20 mM MES-KOH, pH 6.5	$10.3 \pm 0.8$	$0.7 \pm 0.1$
20 mM MES-NaOH, pH 6.5 + 1 mM $\text{CaCl}_2$	$26 \pm 2$	$0.9 \pm 0.1$
20 mM MES-NaOH, pH 6.5 + 1 mM $\text{MgCl}_2$	$10 \pm 2$	$0.8 \pm 0.1$
20 mM MES-NaOH, pH 5.0	$3.5 \pm 0.5$	$0.7 \pm 0.2$
20 mM MES-NaOH, pH 5.5	$4.7 \pm 0.7$	$0.8 \pm 0.1$
20 mM MES-NaOH, pH 6.0	$10 \pm 2$	$0.8 \pm 0.1$
20 mM MES-NaOH, pH 7.0	$10 \pm 2$	$0.8 \pm 0.1$