

Supplementary Video Captions

Video S1. Changes of hASIC1a-pHluorin fluorescence in response to extracellular pH fluctuations. After transfection with hASIC1a⁻²⁹⁸pHluorin²⁹⁹ and mCherry in *Asic1a*^{-/-} neurons, live cell imaging with no delay showed pH-dependent changes in pHluorin fluorescence in response to the perfusion of extracellular solutions with different pH values.

Video S2. Single-particle tracking of surface hASIC1a by ASC06-IgG1-Alexa 488. *Asic1a*^{-/-} neurons transfected with hASIC1a were incubated with ASC06-IgG1-Alexa 488 to label surface hASIC1a. Total internal reflection fluorescent microscope (TIRFM) was used to record lateral mobility of surface hASIC1a. Scanning was performed for 1 to 2 min at a frequency of 20-30 Hz.