

**Title:** Supplementary Movie 1.

**Description:** Animation illustrating the block of sodium influx after HwTxIV-Nvoc illumination. The movie is divided in three episodes. The first episode shows the Na<sup>+</sup> influx in the AIS associated with the generation of an AP using a false color scale and at fast temporal resolution. The second episode shows, at slower temporal resolution, the UV flash uncaging HwTxIV-Nvoc over the soma and the AIS. The third episode shows the absence of Na<sup>+</sup> influx in the AIS after uncaging HwTxIV-Nvoc even when the somatic membrane potential is depolarized to the same level of the AP peak before uncaging HwTxIV-Nvoc.

**Title:** Supplementary Movie 2.

**Description:** Video recorded using Ethovision setup of zebrafish larvae injected with 50 μM AaHII-R<sup>62</sup>K-Nvoc prior to illumination.

**Title:** Supplementary Movie 3.

**Description:** Video recorded using Ethovision setup of zebrafish larvae injected with 50 μM AaHII-R<sup>62</sup>K-Nvoc after 365 nm illumination.

**Title:** Supplementary Data 1.

**Description:** Table of <sup>1</sup>H NMR chemical shifts of the non-caged HwTxIV.