

SUPPLEMENTARY INFORMATIONS :

Compensatory mechanisms in resistant *Anopheles gambiae* AcerKis and KdrKis neurons modulate insecticide-based mosquito control

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Supplementary Table 1 Voltage dependence of activation and inactivation of inward sodium and calcium currents in Kis and KdrKis neurons.

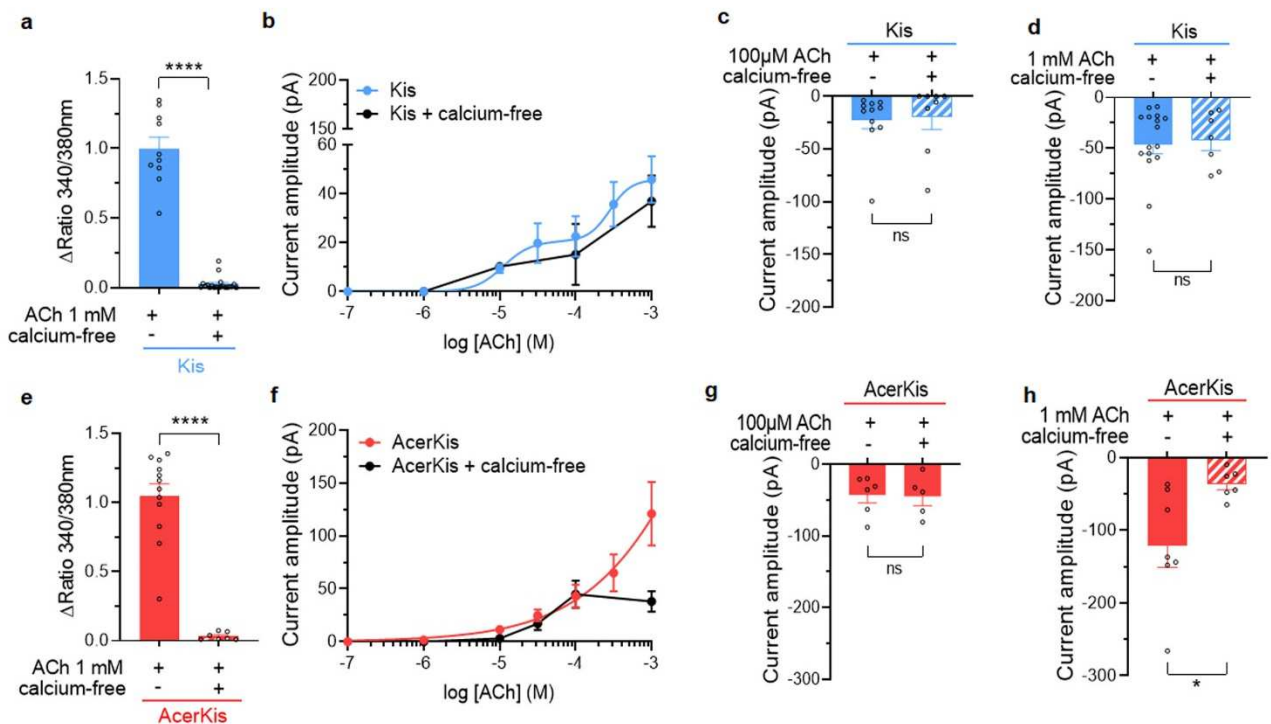
Sodium currents		Kis neurons	KdrKis neurons
Activation	$V_{0.51}$ (mV)	$-55,49 \pm 1,99$ (n=8-10)	$-55,73 \pm 1,78$ (n=5-7)
	k1 (mV)	$6,71 \pm 0,84$ (n=8-10)	$5,73 \pm 1,64$ (n=5-7)
	$V_{0.52}$ (mV)	$-16,68 \pm 1,86$ (n=8-10)	$-21,31 \pm 1,62$ (n=5-7)
	k2 (mV)	$5,78 \pm 0,56$ (n=8-10)	$4,11 \pm 0,64$ (n=5-7)
Inactivation	$V_{0.5}$ (mV)	$-48,50 \pm 3,55$ (n=5-8)	$-46,99 \pm 4,40$ (n=2-4)
	k (mV)	$10,56 \pm 1,07$ (n=5-8)	$14,87 \pm 1,88$ (n=2-4)
Calcium currents		Kis neurons	KdrKis neurons
Inactivation	$V_{0.5}$ (mV)	-24.18 ± 2.17 (n=7)	-23.03 ± 0.70 (n=4)
	k (mV)	8.34 ± 2.20 (n=7)	6.35 ± 2.14 (n=4)

The number of experiments (n) are biologically independent samples.

Supplementary Table 2 Primers used for RT-qPCR analysis of voltage-gated calcium channels expression level in Kis and AcerKis neurons.

Gene	GenBank Accession number	Forward primer (5' to 3')	Reverse primer (3' to 5')
rps7	XM_314557.3	GCCATCCTGGAGCTGGAGAT GAA	GACGGGTCTGTACCTTCT GGA
actin	XM_315271.4	CAGTCCAAGCGTGGTATCCT CA	CTCAGTCAGCAGGACTGG GTGCT
Ca _v 1	EF595743.1	TTCGATGAAGTTTTACCGCCA AC	TGCTAGAACCACCCTTCAT TCC

Supplementary Figure 1



Supplementary Figure 1 Calcium free solution has different effects on the ACh-induced inward current recorded in neurons isolated from Kis and AcerKis strains. **a, e** Comparative histogram illustrating the effects of calcium free solution on the ACh-induced $[Ca^{2+}]_i$ rise (expressed as ratio 340/380 nm) measured in Fura-2-loaded Kis (**a**) and AcerKis (**e**) neuron cell bodies. In both cases, calcium free solution strongly decreases the intracellular calcium elevation evoked by ACh in Kis (**a**, control, $n=10$; in the presence of calcium free solution, $n=20$) and AcerKis neurons (**c**, control, $n=12$; in the presence of calcium free solution, $n=6$). Bars represent mean \pm S.E.M.. The statistical test used was Student unpaired t-test, ****, $p < 0.0001$. **b, f** Superposed semi-logarithmic dose-response curves for the ACh-induced currents recorded in control and in the presence of calcium-free solution at a holding potential of -50 mV in isolated neurons from mosquito strains Kis (**b**, control, $n=5-16$; in the presence of calcium-free solution, $n=5-6$) and AcerKis (**f**, control, $n=3-14$; in the presence of calcium-free solution, $n=5-9$), as indicated in the graph. Data are mean \pm S.E.M.. Note that calcium -free solution only reduced the ACh-induced current amplitude for concentrations higher than $100 \mu\text{M}$

in AcerKis neurons. **c, d** Comparative histogram illustrating the lack of effect of calcium-free solution on the ACh-induced current amplitudes recorded at two different concentrations in Kis neurons (**c**, 100 μ M ACh, control n=11 ; in the presence of calcium-free solution, n=9 and **d**, 1mM ACh, control n=16 ; in the presence of calcium-free solution n=7). Bars represent mean \pm S.E.M. The statistical test used was Student unpaired t-test, ns, non-significant. **g, h** Comparative histogram illustrating the effect of calcium-free solution on the ACh-induced current amplitudes recorded at two different concentrations in AcerKis neurons (**g**, 100 μ M ACh, control, n=6 ; in the presence of calcium free solution, n=5 and **h**, 1mM ACh, control n=7 ; in the presence of calcium free solution, n=6). Bars represent mean \pm S.E.M. The statistical test used was Student unpaired t-test, ns, non-significant, *, $p < 0.05$. In all cases, the number of experiments (n) are biologically independent samples.