Supplementary Information for

Mechanism of functional interaction between potassium channel Kv1.3 and sodium channel NavBeta1 subunit

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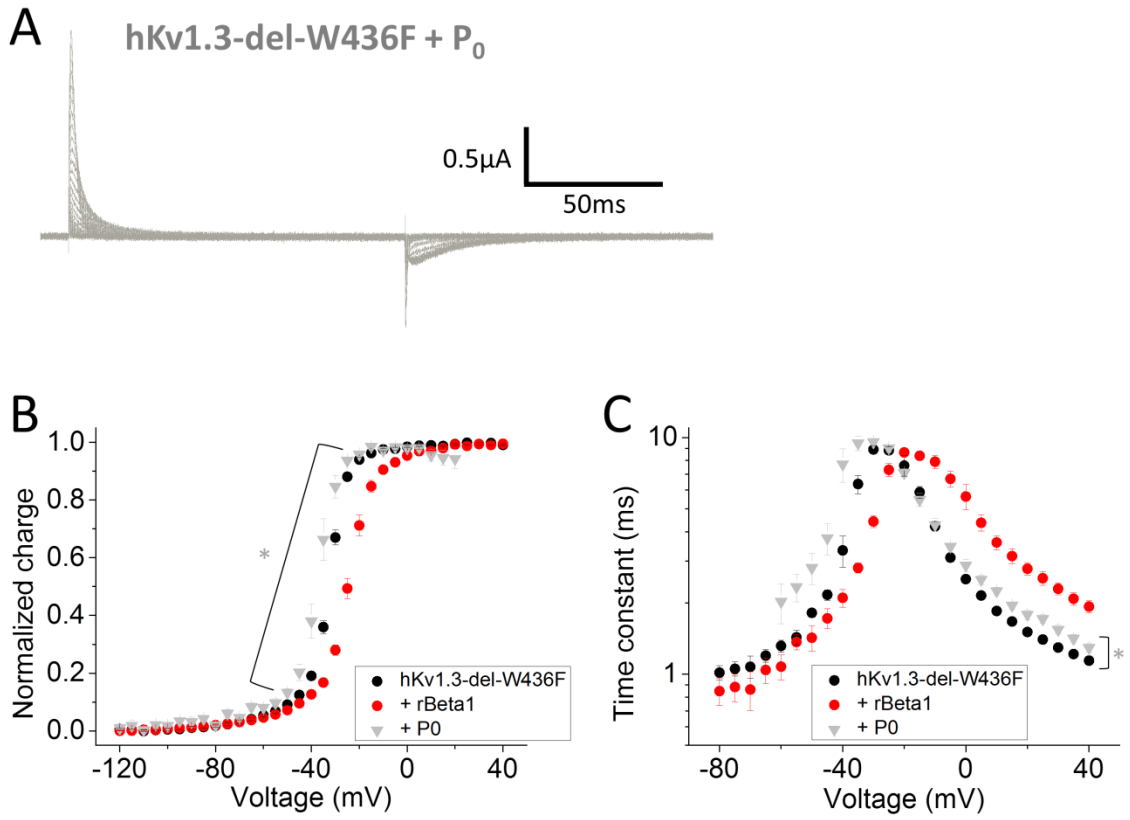

Suppl. Fig 1. Effect of Myelin Basic Protein P_0 on hKv1.3-del-W436F gating currents

A) Representative gating currents from hKv1.3-del-W436F co-expressed with P_0. **B**)-**C**) The Q-V relationship (**B**) and Tau-V curve (**C**) for hKv1.3-del-W436F alone (black circles, n=8), co-injected with rNavBeta1 (red circles, n=5) or with P0 (gray inverted triangles, n=4). Error bars indicate SEM. Gray stars (*) indicate statistical significance (p-value < 0.05) of the difference between hKv1.3-del-W436F (black circles) and with P0 (gray inverted triangles) from -50 mV to -25 mV in Q-V (**C**), and from 0 mV to +40 mV in Tau-V (**D**).

A

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P22001 Human     MDERLSLLRSPP-PPSARHRAHPPQRPASSG-----------GAHTLVNHGYAEPAAGRE
G3QEG2 Gorilla   MDEHLSLLRSPP-PPSARHRAHPPQRPASSG-----------GAHTLVNPGYAEPAAGRE
F6ZSH4 Macaque   MDEHLSLLRSPP-PPSARHRAHPAQRPASSG-----------GAHTLVNPGYAEPAAGPE
F1S626 Pig       MDEHLSLLRSPPPPPSTRHRAHPPQHPASRGGGGGGGGGGGGDAHTLVNPGYAEPAAGPE
P15384 Rat       ------------------------------------------------------------
P16390 Mouse     ------------------------------------------------------------
Q90YY3 Xenopus   ------------------------------------------------------------
H2TUB9 Fugu      MDDHLSLLQSPPPSVTKAR-----------------------GDNLVNHGYTDTEA---


P22001 Human     LPPDMTVVPGDHLLEPEVADG-GGAPPQGGC----GGGGCDRYEPLPPSLPAAGEQDCCG
G3QEG2 Gorilla   LPPNMTVVPGDHMLEPEVADG-GGAPPQGGC----GGGGCDRYEPLPPSLPAAGEQDCCG
F6ZSH4 Macaque   LPPDMTVVPGDHLLEPEVADG-GGAPPQGGC----GGGGCDRYEPLPPSLPAAGEQDCCG
F1S626 Pig       LPPDMTVVPGDHLLEPEAADG-GGDPPQGGCG---GGGGCDRYEPLPPALPAAGEQDCCG
P15384 Rat       ----MTVVPGDHLLEPEAAGGGGGDPPQGGCVSG---GGCDRYEPLPPALPAAGEQDCCG
P16390 Mouse     ----MTVVPGDHLLEPEAAGGGGGDPPQGGCGSGGGGGGCDRYEPLPPALPAAGEQDCCG
Q90YY3 Xenopus   ----MTVVACDNILEEAAALPG--------------HHSSEAYE---------QEDHECC
H2TUB9 Fugu      --DVMTVVACDNMLEESAALPG--------------NHSLDRYE----------PDHECC
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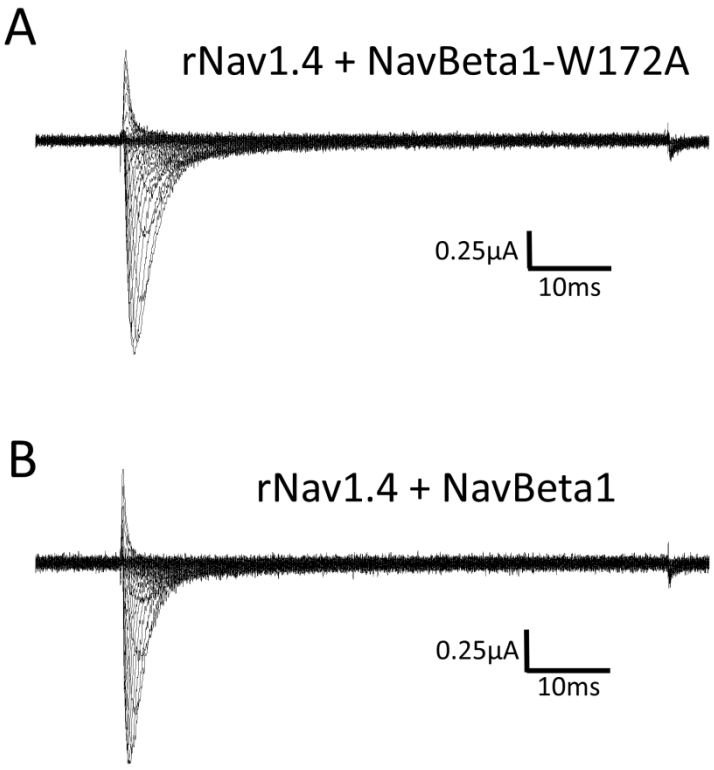
Suppl. Fig 2. KCNA3 N-terminus alignment among species

A) Potential start codons, M1 and M53 in human are highlighted in red. Human, primates, pig and Fugu have longer N-terminus while rodents and *Xenopus* don't.



Suppl. Fig 3. W172A effect on Nav ionic currents

Sodium ionic currents from rat skeletal muscle Nav channel (Nav1.4) co-injected with NavBeta1-W172A (**A**) or with NavBeta1 (**B**). NavBeta1-W172A showed acceleration of fast inactivation similar to NavBeta1.