

**Supplementary Fig. 1:** A: Plasma aldosterone in C57/Bl6 (male) and NMRI mice (male) on control (white bars) and high K<sup>+</sup> diet (black bars). Note the dramatic difference between the two mouse strains. B: Relative expression levels of mRNA of Corticosteroid Hormone Induced Factor (CHIF=FYXD4) in comparison to HPRT in isolated colonic crypts from C57/Bl6 and NMRI mice on control (white bars) and high K<sup>+</sup> diet (black bars)(same animals as under A). Note again the dramatic difference between the two mouse strains. \*indicates statistical significance (P < 0.05) between groups (n=6 in all groups).

**Supplementary Fig. 2:** A: Distal colonic amiloride sensitivity of transepithelial voltages ( $V_{te}$ ) and calculated short circuit currents in BK<sup>+/+</sup> and BK<sup>-/-</sup> mice on control and high K<sup>+</sup> diet. A: Four original Ussing chamber traces are depicted, the two upper ones are from mice on a control diet and the lower ones are from mice fed a high K<sup>+</sup> diet. Luminal amiloride (100  $\mu$ M) is applied in each experiment and the size of the  $V_{te}$  drop reflects the amount of electrogenic Na<sup>+</sup> absorption. B: Summary of calculated amiloride-sensitive short circuit currents in BK<sup>+/+</sup> and BK<sup>-/-</sup> mice on control and high K<sup>+</sup> diet. Note the profound differences between the different genotypes and those induced by the high K<sup>+</sup> diet. \*indicates statistical significance (P < 0.05) between groups (n=8 in all groups).