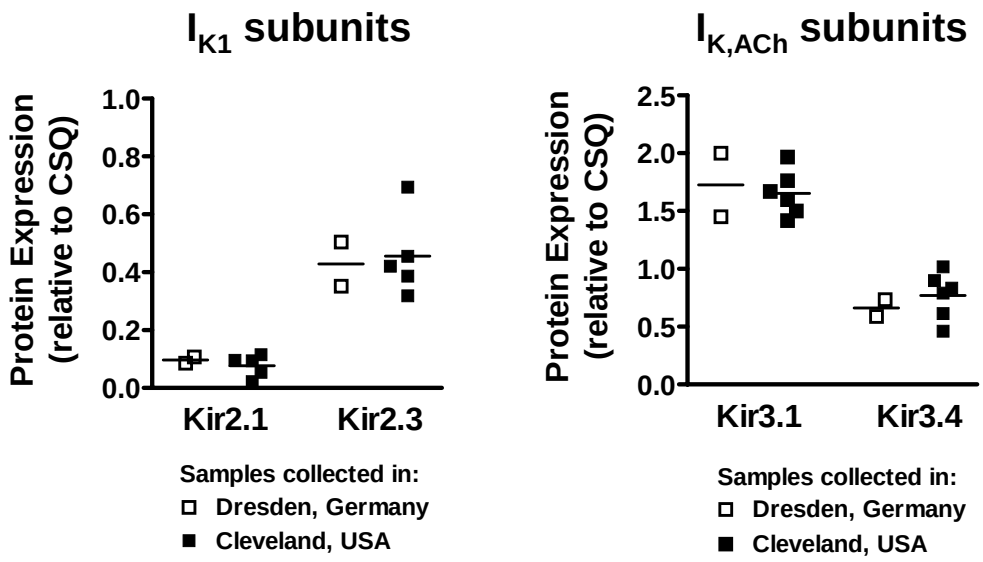
SUPPLEMENTAL MATERIAL

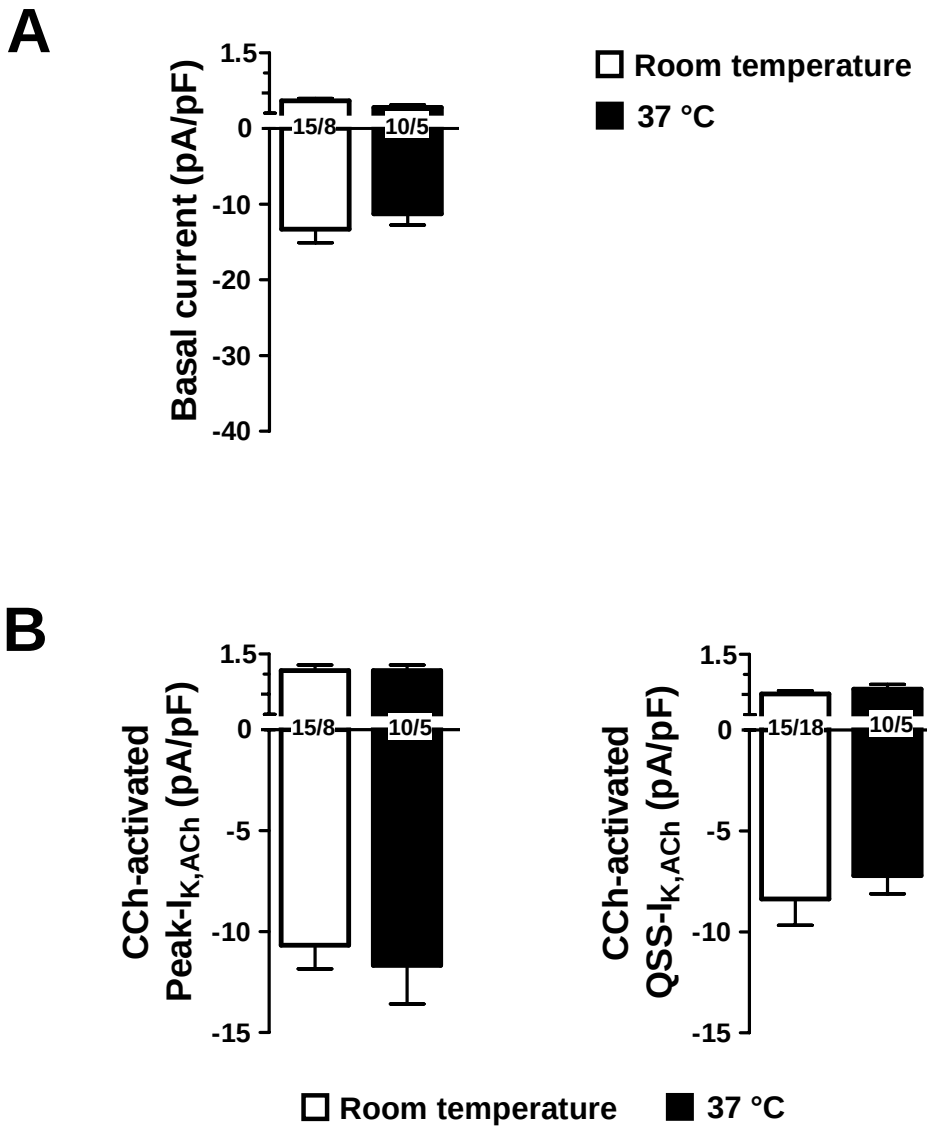
Online Table: Characteristics of patients with normal (non-diseased) atria

	Atrium	Gender	Age	Cause of death	Drugs
1.	RA+LA	female	41	*unknown*	Dopamine
2.	RA+LA	female	18	Open skull fracture	Dopamine, Diuretics
3.	RA+LA	male	18	Cerebral contusion	Dopamine
4.	RA	female	50	Ruptured cerebral aneurysm	Dopamine, Antibiotics
5.	LA	female	42	SAH	Dopamine, Diuretics

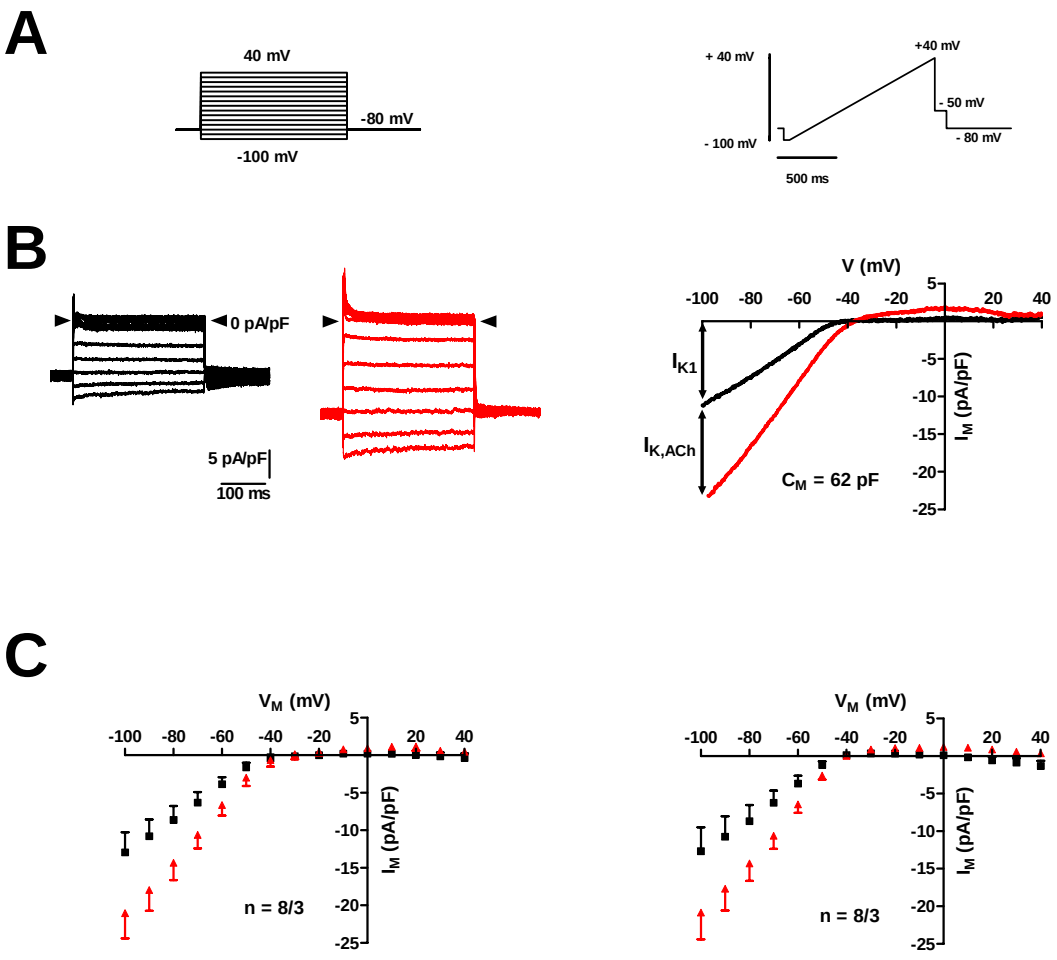
RA, right atrium; LA, left atrium; SAH, Subarachnoid haemorrhage



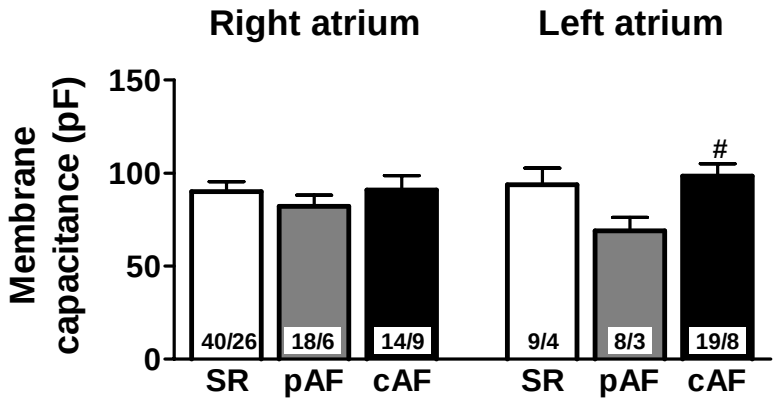
Online Figure 1. Center-related comparison of protein expression in left atrial samples from patients with pAF.



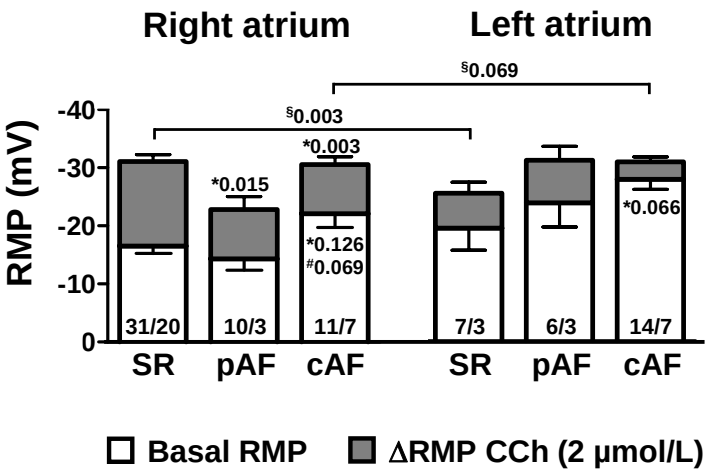
Online Figure 2. Temperature dependence of basal (**A**) inward rectifier current and CCh-activated $I_{K,ACh}$ (**B**) in SR patients. Mean±SEM. Numbers indicate myocytes/patients.



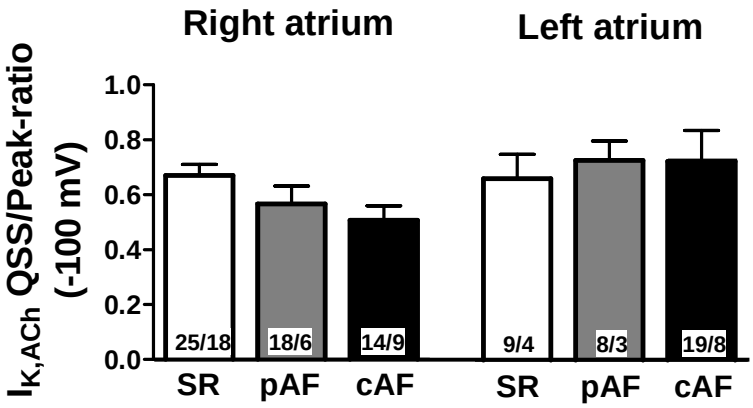
Online Figure 3. Comparison of current-voltage relation curves obtained with step pulse (**A, left panel**) and ramp-pulse (**A, right panel**) protocol respectively. **B,** Corresponding currents in absence (black) and presence (red) of CCh (2 µM) to activate $I_{K,ACh}$. **C,** Corresponding current voltage relationship. Mean±SEM. Numbers indicate myocytes/patients.



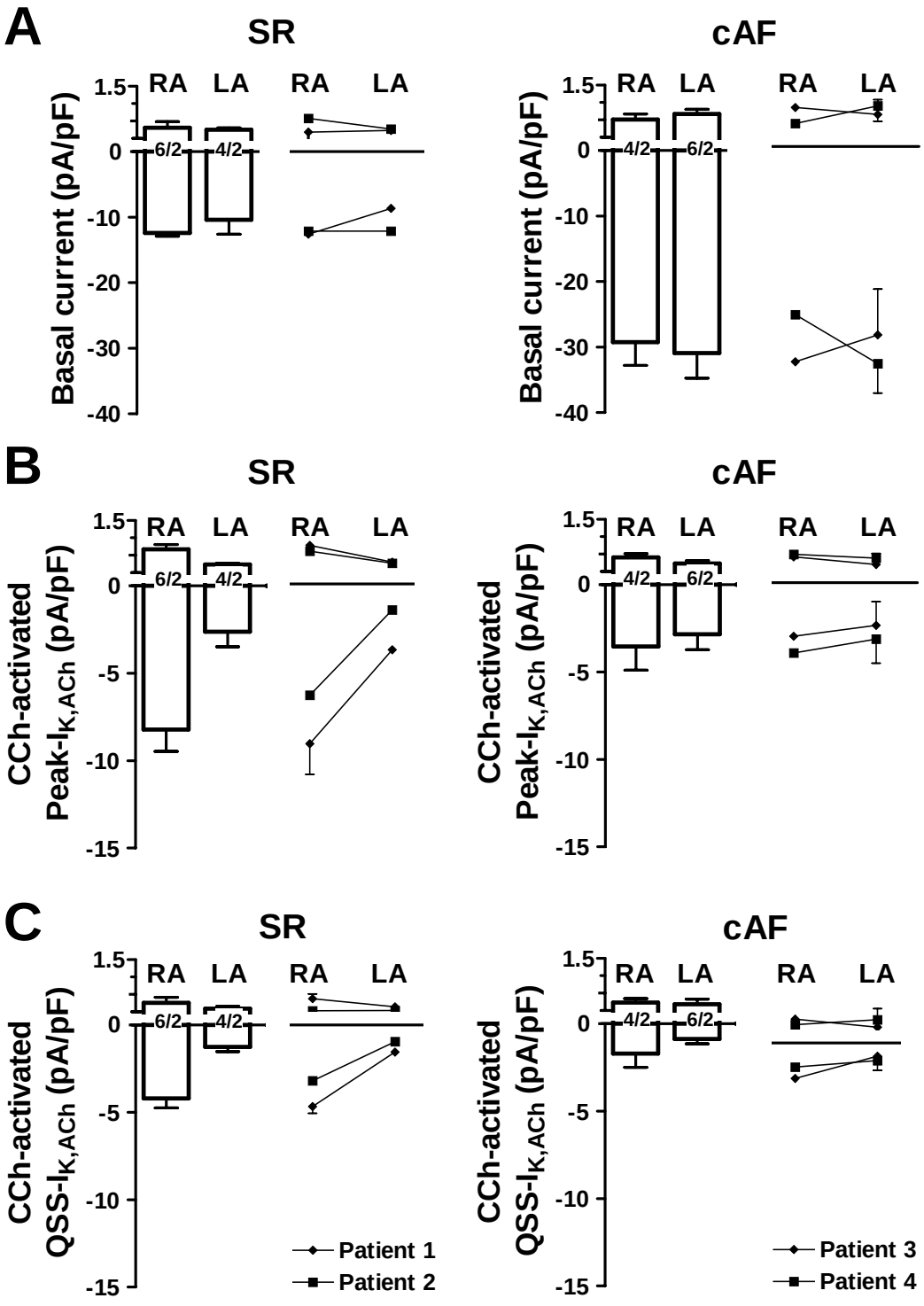
Online Figure 4. Membrane capacitance measurements in right and left atrial appendages from patients with SR, pAF and cAF. Mean±SEM. Numbers indicate myocytes/patients. #P<0.05 vs. corresponding values in pAF.



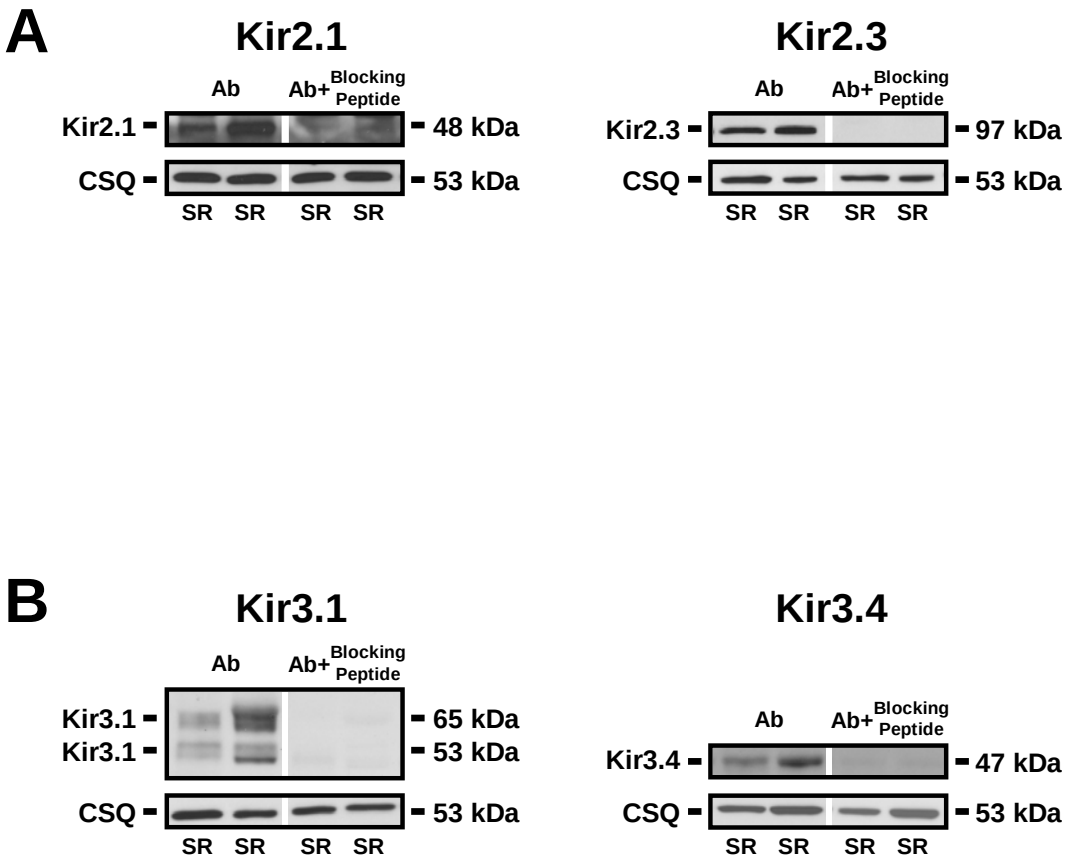
Online Figure 5. Basal resting membrane potential (basal RMP) and CCh-induced hyperpolarisation (ΔRMP CCh) in right and left atrial myocytes from patients with SR, pAF and cAF. Numbers indicate myocytes/patients. Mean±SEM. *P<0.05 and #P<0.05 vs. corresponding values in SR and pAF. §P<0.05 vs. corresponding values in right or left atrium, respectively. P-values within columns refer to basal RMP, whereas all other P-values refer to ΔRMP CCh.



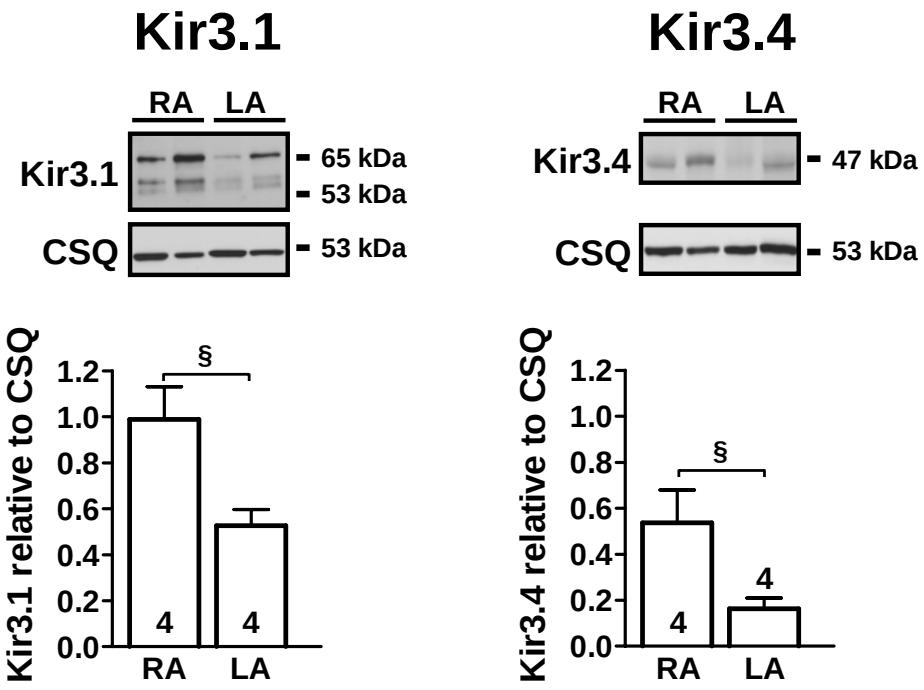
Online Figure 6. Mean±SEM of $I_{K,ACh}$ Peak/QSS-ratio as an index of $I_{K,ACh}$ desensitization (see Figures 3 and 4). Numbers indicate myocytes/patients.



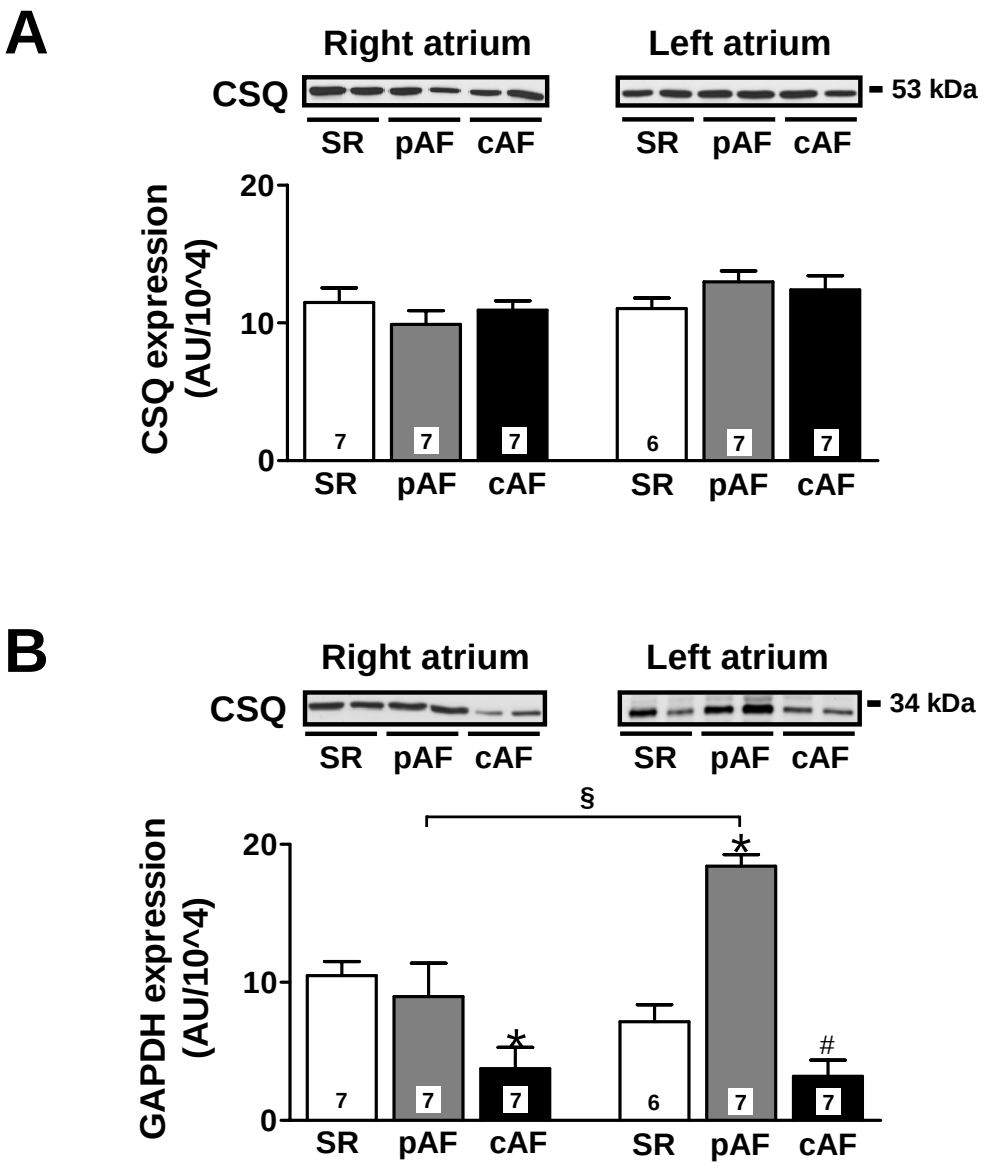
Online Figure 7. Basal inward rectifier current (**A**) and $I_{K,ACh}$ (**B, C**) from matched RA and LA samples obtained from the same SR (left, n=2) and cAF (right, n=2) patients. Columns represent Mean±SEM. Numbers indicate myocytes/patients. Symbols indicate corresponding mean values of each patient.



Online Figure 8. Specificity of used antibodies for Western blot. Specificity of bands recognized by the specific antibodies against Kir2.1, Kir2.3 **(A)**, Kir3.1 and Kir3.4 **(B)** is demonstrated by incubation of the individual antibodies (Ab) with their corresponding immunizing peptides (Ab+Blocking Peptide) which prevents binding of the antibodies to their protein targets. Calsequestrin (CSQ) levels were used as internal (loading) controls. Non-contiguous lanes are separated by white lines.



Online Figure 9. Expression of $I_{K,ACh}$-channel subunits in right (RA) and left (LA) atrial appendages from normal (non-diseased) atria. Representative immunoblots and densitometric analysis of Kir3.1 (left) and Kir3.4 (right) subunits. Numbers indicate tissue samples. $^{\S}P<0.05$ vs. corresponding values in right atrium.



Online Figure 10. Comparison of CSQ (**A**) and GAPDH (**B**) protein levels (arbitrary units, AU) in right (RA) and left (LA) atria from SR, pAF and cAF patients. *P<0.05 vs. corresponding SR and pAF; #P<0.05 vs. corresponding pAF; §P<0.05 vs. pAF in RA.