Ataxia Syndromes			
	Disease	Channel	Gene
Episodic Ataxia	EA1	$K_V1.1$	KCNA1
	EA2	$Ca_V2.1$	CACNA1A
Spinocerebellar ataxia	SCA6	$Ca_V2.1$	CACNA1A
	SCA13	$K_v3.3$	KCNC3
	SCA19 and SCA22	$K_v4.3$	KCND3

Supplemental Table 2: Ataxia syndromes caused by inherited mutations in ion channel genes

Familial Hemiplegic Migraine		
Subtype	Channel	Gene
FHM1	$Ca_V2.1$	CACNA1A
FHM2	α subunit of Na/K pump	ATP1A2
FHM3	α subunit of Na_v 1.1	SCN1A

Supplemental Table 3: Migraine syndromes caused by inherited mutations in ion channel genes

Peripheral nerve channelopathies				
Pain	Painful syndromes	Primary Erythromelalgia	$Na_V1.7$	SCN9A
		Paroxysmal extreme pain disorder	$Na_V1.7$	SCN9A
		Familial episodic pain syndrome	TRP 1	TRPA1
			$NA_V1.9$	SCN11A
	Insensitivity to pain	Congenital insensitivity to pain	$Na_v1.7$	SCN9A
			$NA_V1.9$	SCN11A
Neuropathies Motor and sensory neuropathies		HSMNIIC	TRPV4	TRPV4 channel
		Scapuloperoneal SMA		
		Congenital Distal SMA		
		HSANIID	$Na_V1.7$	SCN9A
Peripheral Nerve Hyperexcitability		EA1	KV1.1	KCNC1
			$K_v7.2$	KCNQ2

Supplemental Table 4: Inherited pain syndromes and neuropathies caused by mutations in ion channel genes

Congenital Myasthenic Syndromes		
Syndrome	Channel	Gene
AChR deficiency Syndromes	α subunit of AchR	CHRNA1
	β subunit	CHRNB1
	δ subunit	CHRND
	ε subunit	CHRNE
Slow channel Syndrome	α subunit of AchR	CHRNA1
	β subunit	CHRNB1
	δ subunit	CHRND
	ε subunit	CHRNE
Fast Channel Syndrome	α subunit of AchR	CHRNA1
	δ subunit	CHRND
	ε subunit	CHRNE

Supplemental Table 5: Congenital Myasthenic Syndromes caused by inherited mutations in ion channels

Skeletal muscle channelopathies			
Syndrome	Disease	Channel	Gene
Non Dystrophic Myotonias	Myotonia Congenita	CLC-1	CLCN1
	PMC	$Na_V1.4$	SCN4A
	SCM	$Na_V1.4$	SCN4A
Periodic Paralyses	HypoPP	$Ca_V1.1$	CACNA1S
		$Na_V1.4$	SCN4A
	Hyper PP	$Na_V1.4$	SCN4A
	ATS	Kir 2.1	KCNJ2
		Kir 3.4	KCNJ5
	Thyrotoxic periodic paralysis	Kir 2.6	KCNJ18

Supplemental Table 6: Skeletal muscle channelopathies