

**SUPP. TABLE S1. Somatic and multiple mutations found in the AR gene**

<b>Phenotype</b>	<b># cases with somatic mutations</b>	<b>Effect of mutation</b>	<b># with somatic mosaicism</b>	<b># with multiple mutations</b>
Prostate cancer	159	Gain of function	3	27
Other cancers	8	Gain of function	0	0
AIS	25	Loss of function	9	9

**SUPP. TABLE S2. Diseases associated with AR CAG repeat length variation**

<b>Direct association</b>	<b>CAG repeat</b>	<b>Androgen sensitivity</b>	<b>Gain of function - possible causes</b>	<b>Symptoms</b>	<b>Reference</b>
SBMA	≥ 38	Reduced	1-Misfolding 2-Truncation 3-Aggregation 4-Sequestration of AR protein / transcription factors 5-Proteasome inhibition 6-Mitochondrial dysfunction 7-Ligand driven 8-Impairment of autophagy 9-Interruption of axonal transport	1-Adult onset motor neuropathy of proximal muscles of hip and shoulder 2-Hypogonadism results in gynecomastia and testicular atrophy	Beitel et al. (2005) Neurotox Res 7:219-230
<b>Indirect association</b>	<b>CAG repeat length</b>		<b>Associated risk factors</b>	<b>Comments</b>	
<b>1. Cancers</b>					
Prostate	<sup>a</sup> Shorter	Increased	1-Ethnicity 2-Family history	Inconclusive studies- possible somatic alterations	Rajender et al. (2007) Asian J Urology 9:147-179
Ovarian	<sup>a</sup> Shorter	Increased	BRCA mutation carriers?	Inconclusive studies- possible somatic alterations	Rajender et al. (2007) Asian J Urology 9:147-179
Endometrial	<sup>a</sup> Longer	Reduced		Inconclusive studies- possible somatic alterations	Rajender et al. (2007) Asian J Urology 9:147-179
Female breast	<sup>a</sup> Longer & shorter	Reduced & increased	BRCA1 mutation carriers?	Inconclusive and confusing studies- possible somatic alterations	Rajender et al. (2007) Asian J Urology 9:147-179 Gottlieb et al. (2010) Hum Genet 127:491-501
Colorectal	<sup>a</sup> Shorter	Increased		Selective growth advantage - somatic alterations & somatic mosaicism	Ferro et al., (2002) Mol. Cell. Endocr. 193: 109-120 Di Fabio et al., (2009) J Surg Res 154:38-44
Esophageal	<sup>a</sup> Shorter	Increased	Ethnicity	Inconclusive studies- except in African males	Dietzch et al., (2003) Int. J. Cancer. 107:38-45
Head & Neck	<sup>a</sup> Longer	Increased			dos Santos et al. (2004) Oral Oncol 40:177-182
<b>2. Other diseases, &amp; abnormal traits</b>					
Male infertility	<sup>a</sup> Longer	Reduced	Ethnicity	Many studies inconclusive- 1 study (Japanese) - shorter length significant	Rajender et al. (2007) Asian J Urology 9:147-179
Bone & Mineral Density	<sup>a</sup> Longer & shorter	Reduced	Gender	Inconclusive studies- possible gender differences	Rajender et al. (2007) Asian J Urology 9:147-179

Endometriosis & uterine leiomyoma	<sup>a</sup> Shorter	Increased		Asian Indian population	Shaik et al. (2009) Hematol Oncol Stem Cell Ther 2:289-293
Acne, hirsutism and alopecia	<sup>a</sup> Shorter	Increased		Found in both men & women	Sawaya et al. (1998) J Cutan Med Surg 3:9-15
Alzheimer's Disease	<sup>a</sup> Shorter	Increased	Gender	No association seen in women	Lehmann et al. (2003) Neurosci Lett 340:87-90
Arthritis	<sup>a</sup> Shorter	Increased	Gender	Associated with younger age of onset	Kawasaki et al. (1999) Ann Rheum Dis 58:500-502
Platelet reactivity	<sup>a</sup> Longer	Reduced		Eastern European population	Kuliczowski et al. (2010) Thrombosis Res 126:e65-e67
Hypertension	<sup>a</sup> Shorter	Increased	Gender	Hypertension due to higher modulation of vasomotor tone	Pausova et al. (2010) Hypertension 55:706 - 714.
Muscle & adipose tissue changes	Shorter	Increased	Gender	Increase in thigh & lower back muscle. Decrease in adipose tissues	Neilsen et al. (2010) Eur J Endocrinol 162:795-804
Autism	<sup>a</sup> Shorter	Increased	Gender	Increased disease in females only	Henningsson et al. (2009) Psychoneuroendocrin 34:752-761.
Personailty traits	<sup>a</sup> Shorter	Increased	Gender	Associated with neuroticism and extraversion	Westberg et al. (2009) J Psychiatry Neurosci 34:205-13
Violent criminal behavior	<sup>a</sup> Shorter	Increased	Gender	Associated with both rape and murder	Rajender et al. (2008) Int J Legal Med 122:367-372

<sup>a</sup>Shorter and longer length CAG repeats are either shorter and longer than the average control CAG repeat length values (between 21-22).

**SUPP. TABLE S3. Extract from list of androgen receptor coregulators and interacting proteins**

Gene <sup>a</sup>	Protein	Function	CoA/ CoR <sup>b</sup>	Inter- action	Domain <sup>c</sup>	Also known as
<u>PRMT1</u>	PRMT1	histone modifier	coA	indirect		protein arginine methyltransferase 1 ANM1; HCP1; IR1B4; HRMT1L2; PRMT1
<u>PRPF6</u>	p102 U5snRNP/ ANT-1	splicing/ RNA metabolism	coA	direct		U5 snRNP-associated 102 kDa protein; androgen receptor N-terminal domain transactivating protein-1 TOM; ANT-1; hPrp6; U5-102K; C20orf14; PRPF6
<u>PSMC3IP</u>	GT198	nuclear receptor coregulator	coA	direct	DBD	PSMC3 interacting protein; GT198 alternative; TBP-1 interacting protein HOP2; GT198; TBPIP; HUMGT198A; PSMC3IP
<u>PSPC1</u>	PSP1	splicing/ RNA metabolism	ND	direct		paraspeckle protein 1 PSP1; FLJ10955; DKFZp566B1447; PSPC1
<u>PTEN</u>	PTEN	phosphatase	coR	direct		phosphatase and tensin homolog BZS; MHAM; TEP1; MMAC1; PTEN1; 10q23del; MGC11227; PTEN
<u>PXN</u>	Paxillin	signaling	coA	direct		paxillin FLJ16691; PXN
<u>RAD54L2</u>	ARIP4	chromatin remodeling	coA	direct	DBDh	RAD54-like 2; mouse: androgen receptor-interacting protein 4 HSPC325; FLJ21396; FLJ22400; KIAA0809; SRISNF2L; RAD54L2; Mouse: Arip4; Rad54l2
<u>RAD9A</u>	Rad9	DNA repair	coR	direct		RAD9 homolog RAD9; RAD9A
<u>RAN</u>	ARA24/Ra n	signaling	coA	direct	NTD	ras-related nuclear protein; AR associated protein 24 TC4; Gsp1; ARA24; RAN
<u>RANBP9</u>	RanBPM	signaling	coA	direct		RAN binding protein 9 RANBPM; RANBP9
<u>RB1</u>	Rb	cell cycle regulator	coA	direct	NTD-DBD	retinoblastoma 1; retinoblastoma RB; pRb; OSRC; pp110; p105-Rb; RB1
<u>RBAK</u>	RbaK	cell cycle regulator	coA	direct		RB-associated KRAB repressor ZNF769; RBAK
<u>RCHY1</u>	ARNIP/ PIRH2	UPS	coA	direct	NTD	ring finger and CHY zinc finger domain containing 1; AR N-terminal interacting protein ARNIP; CHIMP; PIRH2; RNF199; ZNF363; hARNIP; PRO1996; DKFZp586C1620; RCHY1

<sup>a</sup>Entrez Gene official symbol (with hyperlink)

<sup>b</sup>CoA, coactivator; CoR, corepressor; ND, not determined

<sup>c</sup>interaction with defined AR domain. NTD, N-terminal domain; DBD, DNA-binding domain; DBDh, DBD-hinge, LBD, ligand-binding domain

Note: Hyperlinked references available in on-line table at <http://androgendb.mcgill.ca/>