

Supplementary Table S1: C3 variant nomenclature identified in the *BRCAX* cohort

Gene	Variant Nomenclature
ALK	c.2488A>T; (p.Met830Leu) c.2489T>C ; (p.Met830Thr) ⁸
APC	c.4963A>G; (p.Thr1655Ala) ⁵ c.5282A>C; (p.Asn1761Thr) ⁵ c.5939A>G ; (p.Asn1980Ser) ^{NBN}
ATM	c.7399G>A ; (p.Val2467Ile) c.5042T>C ; (p.Ile1681Thr) c.5190A>G ; (Silent)
AXIN2	c.2405+4A>G ; (Intronic) c.544A>G, p.Met182Val
BAP1	c.1810G>A ; (p.Val604Met)
BLM	c.968A>G; (p.Lys323Arg) ⁶
BMPR1A	c.751G>T ; (p.Gly251Cys)
BRCA1	c.-19-235G>A; IVS1-235A>G ²
BRIP1	c.2563C>T ; (p.Arg855Cys)
CDH1	c.1435G>A ; (p.Asp479Asn) c.2635G>A; p.Gly879Ser exon 16
CDKN1B	c.407A>G; (p.Asp136Gly) ¹
CHEK2	c.1175C>T; (p.Ala392Val)
DICER1	c.1561A>G ; (p.Ile521Val)
DIS3L2	c.1337G>T; p.Arg446Met
EGFR	c.3629C>T; (p.Ala1210Val)
FH	c.379G>T; p.Val127Leu ¹²
MSH6	c.2641delinsAAAA (p.Gly881delinsLysSer) c.1538T>C ; (p.Ile513Thr) ^{BRCA2}
MSH2	c.1313C>G; p.Thr438Ser
MUTYH	c.719C>T ; (p.Ala240Val) ¹⁰ c.349-4A>T ; (Intronic)
PALB2	c.2674G>A; (p.Glu892Lys) ⁴ c.2417C>T; (p.Pro806Leu) c.3494C>G; (p.Ser1165Trp) c.2816T>G p.Leu939Trp
PDGFRA	c.2711C>T ; (p.Thr904Ile)
POLD1	c.245C>T; (p.Pro82Leu) c.3221G>A; (p.Arg1074Gln) c.3136G>T; (p.Ala1046Ser) ⁹
POLE	c.1999A>C; (p.Met667Leu) ⁴ C3/c.1357C>G ; (p.Gln453Glu) ⁶ c.1A>T; (p.Met1?) ⁸

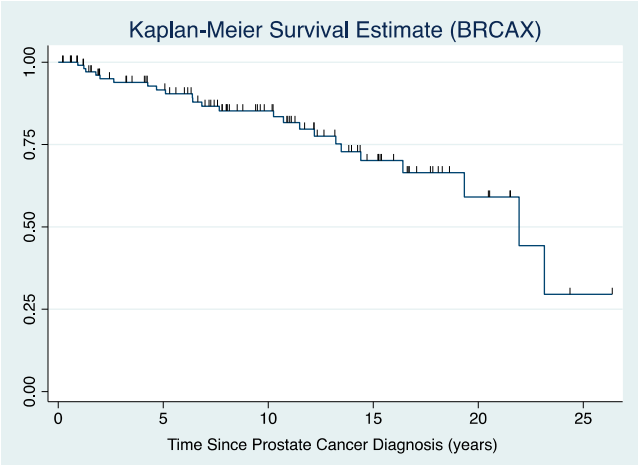
POT1	c.4736G>A (p.Arg1579His) ¹¹
RAD51C	c.670G>A; (p.Asp224Asn) ²
	c.904+34T>C; (rs28363318) ^{1, 3}
	c.536A>G; (p.His179Arg)
RB1	c.48C>A ; (Silent)
RET	c.1878G>A; (Silent) ¹⁰
RUNX1	c.613+2dup ; (Splice site) ⁷
SMARCA4	c.1497G>T; (p.Lys499Asn) ⁷
	c.4981G>A ; (p.Asp1661Asn) ⁹
TSC2	c.4393G>A (p.Asp1465Asn) ¹¹
WRN	c.334T>C; (p.Phe112Leu)
	c.229G>C; (p.Asp77His) ³
	c.4165A>G; p.Lys1389Glu ¹²

**some men carried more than one variant; different variants carried by the same patient are denoted with matching superscript eg. a single patient carried both variants denoted by ¹, another individual carried both variants denoted by ².*

Supplementary Table S2: Non-Prostate Primary Cancers verified among the *BRCAX* cohort

<i>BRCAX</i> Group Other Verified Primary Cancers n, (%)	
Breast	1 (0.93%)
Colon/colorectal	4 (3.7%)
Melanoma	8 (6.5%)
Blood (MDS/lymphoma)	3 (2.8%)
Bladder	2 (0.93%)
Lung	2 (1.85%)

Supplementary Figure S1. Survival time in years for *BRCAX* cohort patients, following a diagnosis of prostate cancer. Censorship from the study is indicated with vertical lines.



Supplementary Figure S2. Kaplan Meier curve showing prostate cancer-specific survival of patients from the PCOR cohort following a diagnosis of prostate cancer. The cohort was subdivided by ISUP Grade with worse survival outcomes evident for patients with ISUP 5 disease (bottom line) and ISUP 4 disease (second from bottom) compared to patients with lower grade disease[17]

