

Supplementary table S15

The literature data about associations of the studied polymorphisms of the *MMP* genes with breast cancer

Chr	SNP	Gene	Number of publications in PubMed/Pub Med Central	Phenotype	Association, significance (associated allele/genotype/haplotype)	Reference
11	rs1940475	<i>MMP-8</i>	9/25	breast cancer	p>0.05	Pharoah et al., 2007
				breast cancer metastasis	OR=0.60, p=0.03 (T)	Decock et al., 2007
				breast cancer	p>0.05	Mavaddat et al., 2009
				breast cancer	p>0.05	Wang et al., 2018
				breast cancer	OR=1.23, p=0.048 (haplotype AGTCA rs3740938-rs2012390-rs1940475-rs11225394-rs11225395)	Wang et al., 2018
11	rs1799750	<i>MMP-1</i>	92/156	breast cancer	p>0.05	Biondi et al., 2000
				breast cancer metastasis	p>0.05	Ghilardi et al., 2002
				breast cancer metastasis	OR>1, p<0.001 (2G)	Przybylowska et al., 2004
				breast cancer metastasis	OR=2.14, p<0.05 (2G/2G) OR=1.68, p<0.05 (2G)	Przybylowska et al., 2006
				breast cancer malignance	OR=2.58, p<0.05 (2G)	Przybylowska et al., 2006
				lymph node-positive breast cancer	OR=3.9, p<0.05 (2G/2G) (mixed ethnicities) OR=2.6, p<0.05 (2G/2G) (caucasian)	Hughes et al., 2007
				reduced survival among breast cancer women	HR=3.1, p<0.05 (2G/2G)	Hughes et al., 2007
				breast cancer	p>0.05	Beeghly-Fadiel et al., 2009a
				breast cancer	p>0.05	McColgan et al., 2009
				breast cancer	p>0.05	Zhou et al., 2011
				breast cancer metastasis	OR=2.18, p<0.05 (2G/2G) OR=1.59, p<0.05 (2G/2G + 1G/2G)	Liu et al., 2012

				breast cancer	p>0.05	Su et al., 2016
				breast cancer	p>0.05	Zhou et al., 2018
				breast cancer	OR>1, p<0.05 (2G)	Padala et al., 2017
				breast cancer	p>0.05	Hsiao et al., 2018
				breast cancer	p>0.05	Białkowska et al., 2020
				breast cancer	OR = 4.86, p = 0.0001 (2G2G vs. 1G1G)	Balkhi et al., 2020
				breast cancer	OR<1, p<0.05 (1G/2G)	Sui et al., 2021
11	rs679620	MMP-3	41/100	breast cancer	p>0.05	Beeghly-Fadiel et al., 2009a
				breast cancer (lymph node or distant metastasis)	OR<1, p=0.049 (AG)	Chan, 2013
16	rs243865	MMP-2	92/109	breast cancer	OR=0.46, p<0.05 (CT+ TT vs. CC)	Zhou et al., 2004
				poor survival among patients with ER negative of breast cancer	p < 0.001 (TT vs. CC +CT)	Griewerth et al., 2004
				breast cancer	p>0.05	Lei et al., 2007
				breast cancer progesterone receptor status	OR 2.34, p<0.05 (combination TT rs243865 and CC rs3918242)	Lei et al., 2007
				breast cancer	p>0.05	Roehe et al., 2007
				breast cancer	OR=2.15, p=0.01 (CC)	Delgado-Enciso et al., 2008
				breast cancer among women younger than 50 years of age	OR=2.66, p<0.05 (CC)	Delgado-Enciso et al., 2008
				breast cancer	p>0.05	Beeghly-Fadiel et al., 2009b
				breast cancer	p>0.05	McColgan et al., 2009
				breast cancer	OR = 1.27, p = 0.001 (CC)	Zhou et al., 2011
				breast cancer metastasis	p>0.05	Liu et al., 2012
				breast cancer	OR=2.02, p=0.02 (CC)	Saeed et al., 2013
				breast cancer	p>0.05	Zagouri et al., 2013
				breast cancer	p>0.05	Slattery et al., 2013

				breast cancer	p>0.05	Ledwoń et al., 2013
				breast cancer	p>0.05	Shevchenko et al., 2014
				breast cancer (summary, European and Asian)	p>0.05	Yang et al., 2014
				breast cancer (Latin-Americans)	OR=0.61, p=0.02 (TT+TC vs CC)	Yang et al., 2014
				breast cancer	OR=0.49, p<0.05 (TT+TC vs CC)	Néjima et al., 2015
				breast cancer	p>0.05	Manshadi et al., 2018
				breast cancer	OR=0.001, p<0.05	Habel et al., 2019
				Histological type (ductal/lobular/mixed) of breast cancer	P=0.002	Habel et al., 2019
				breast cancer	OR=0.39-0.49, p<0.0025 (haplotypes GCTT and GTTC rs243866- rs243865- rs243864- rs2285053)	Habel et al., 2019
				breast cancer	p>0.05	Ou et al., 2020
				breast cancer	p>0.05	Białkowska et al., 2020
20	rs3918242	MMP-9	139/194	good prognosis (non- ductal type histology, positive ER status and the absence of TP53 mutation) among breast cancer patients	p < 0.05 (T)	Griew et al., 2004
				breast cancer metastasis	p>0.05	Przybyłowska et al., 2006
				breast cancer malignance	OR=2.61, p<0.05 (T)	Przybyłowska et al., 2006
				breast cancer	p>0.05	Roehe et al., 2007
				breast cancer	p>0.05	Lei et al., 2007
				breast cancer progesterone receptor status	OR 2.34, p<0.05 (combination TT rs243865 and CC rs3918242)	Lei et al., 2007
				lymph node-positive	OR=3.6, p<0.05 (TT) (mixed	Hughes et al., 2007

				breast cancer	ethnicities) OR=9.1, p<0.05 (TT) (caucasian)	
				breast cancer	OR=3.27, p=0.004 (T)	Sadeghi et al., 2009
				breast cancer	p>0.05	McColgan et al., 2009
				breast cancer	p>0.05	Beeghly-Fadiel et al., 2011
				breast cancer	p>0.05	Zhou et al., 2011
				breast cancer metastasis	p>0.05	Liu et al., 2012
				breast cancer	OR>1, p<0.001 (T)	Chiranjeevi et al., 2014
				breast cancer	OR=0.22, p=0.007 (TT)	Shevchenko et al., 2014
				breast cancer lymph node metastasis	OR=0.60, p=0.45 (CC)	Shevchenko et al., 2014
				breast cancer	OR=1.55, p=0.009 (TT vs. CT+CC)	Zhang et al., 2015
				breast cancer	OR=1.87, p=0.035(T)	Rahimi et al., 2015
				breast cancer	OR=1.8, p<0.05 (T)	AbdRaboh et al., 2016
				breast cancer	p>0.05	Bargostavan et al., 2016
				breast cancer	p>0.05	Toroghi et al., 2017
				breast cancer	OR>1, p<0.05 (T)	Padala et al., 2017
				breast cancer	OR=4.82, p<0.001 (T)	Manshadi et al., 2018
				breast cancer	p>0.05	Felizi et al., 2018
				breast cancer	p>0.05	Abd Elmaogoud Ragab Ibrahim et al., 2020
				breast cancer	OR=1.34, p=0.028 (T)	Xu et al., 2020
				breast cancer	OR=1.43, p=0.002 (T)	Yan et al., 2022
20	rs3918249	MMP-9	16/25	breast cancer	p>0.05	Beeghly-Fadiel et al., 2011
				breast cancer	p>0.05	Slattery et al., 2013
				ER-/PR- status of breast cancer	OR=1.18, p=0.048 and OR=0.73, p=0.016 (haplotype AT and GC rs3918261-rs3918249 respectively)	Slattery et al., 2013
				ER+/PR- status of breast cancer	OR=0.71, p=0.044 and OR=5.02, p=0.02 (haplotype GC and GT rs3918261-rs3918249 respectively)	Slattery et al., 2013

				breast cancer	p>0.05	Wang et al., 2018
				breast cancer	OR=1.37, p=0.019 (haplotype CCG rs3918249-rs3918254-rs3787268)	Wang et al., 2018
20	rs17576	MMP-9	94/127	breast cancer	p>0.05	Beeghly-Fadiel et al., 2011
				breast cancer	OR=1.21, p=0.03 (Q279R)	Resler et al., 2013
				breast cancer survival	p>0.05	Fu et al., 2013
				breast cancer	OR=4.73, p=0.006 (GG)	Chahil et al., 2015
				breast cancer	p>0.05	Zhang et al., 2015
				breast cancer	OR=13.13, p<0.003 (GG)	Oliveira et al., 2020
				breast cancer in premenopausal women	p>0.05	Oliveira et al., 2020
				breast cancer in postmenopausal women	OR>1, p<0.006 (GG)	Oliveira et al., 2020
				breast cancer	p>0.05	Xu et al., 2020
				breast cancer	p>0.05	Yan et al., 2022
20	rs3787268	MMP-9	20/33	breast cancer	p>0.05	Beeghly-Fadiel et al., 2011
				poor disease-free survival of breast cancer patients	p=0.045 (AA+GA)	Fu et al., 2013
				poor distance disease-free survival of breast cancer patients	p=0.028 (AA+GA)	Fu et al., 2013
				breast cancer	p>0.05	Slattery et al., 2013
				breast cancer (among women with the 71–100% Native American Ancestry)	OR=1.52, p=0.037 (AA+GA vs. GG)	Slattery et al., 2013
				breast cancer	p>0.05	Zhang et al., 2015
				breast cancer	OR=0.82, p=0.025 (A)	Wang et al., 2018
				breast cancer	OR=1.37, p=0.019 (haplotype CCG rs3918249-rs3918254-rs3787268)	Wang et al., 2018
				breast cancer	p>0.05	Xu et al., 2020

				breast cancer	OR=0.82, p=0.007 (A)	Yan et al., 2022
20	rs2250889	MMP-9	22/38	breast cancer	p>0.05	Beeghly-Fadiel et al., 2011
				breast cancer survival	p>0.05	Fu et al., 2013
				breast cancer	OR=10.84, p=0.007 (GG)	Chahil et al., 2015
				breast cancer	p>0.05	Zhang et al., 2015
				breast cancer	p>0.05	Al-Eitan et al., 2017
				breast cancer	OR=2.53, p=0.012 (GG+GC vs. CC)	Xu et al., 2020
				breast cancer	p>0.05	Yan et al., 2022
20	rs17577	MMP-9	28/30	poor disease-free survival among estrogen receptor (ER)+/epidermal growth receptor 2 (HER-2)–breast cancer patients	HR=2.59, p<0.05 (combination AA+GA rs3787268 and GG rs17577)	Fu et al., 2013
				poor distance disease-free survival among estrogen receptor (ER)+/epidermal growth receptor 2 (HER-2)–breast cancer patients	HR=3.25, p<0.05 (combination AA+GA rs3787268 and GG rs17577)	Fu et al., 2013

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